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UNTERSUCHUNGEN ZUR BMI-ABHÄNGIGKEIT DES BLICKVERHALTENS VON FRAUEN BEI LEBENSMITTELN MIT UNTERSCHIEDLICHEM KALORIENGEHALT MIT HILFE EINES TOBII EYE TRACKERS

Masterarbeit

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Vorwort

In dieser Arbeit wurde der Zusammenhang zwischen dem Body-Maß-Index und dem Blickverhalten bezüglich unterschiedlicher Lebensmittel überprüft. Die Untersuchungen geschahen mit Hilfe eines TOBII Eye Trackers. Diese Innovation wird bereits in mehreren Bereichen in der Wirtschaft und Forschung eingesetzt und genutzt, auf dem Gebiet der Ernährungs- und Lebensmittelwissenschaft befinden wir uns noch auf einer Terra incognita.

Frauen unterschiedlichen BMIs wurden Bilder mit kalorienreichen und –armen Lebensmitteln gezeigt, und es werden Gemeinsamkeiten und Zusammenhänge herausgearbeitet.

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Abstract

This work investigated the gazing behavior of females with different body mass indices when looking at pictures with food of low and high energy density. There appeared to be no general significant gazing behavior differences between underweighted, normalweighted, overweighted and obese women. Nevertheless we found significant differences between obese and underweighted females in “time to first fixation” with picture “bananas and chocolate”, in “fixation length” and “observation length” with the picture “hamburger and pear” and in “observation count” of pictures “chips and grapes”, “bananas and chocolate” and “schnitzel and salad”. Our results also show that there are significant correlations between BMI and gazing behavior when using food of obviously different energy density in some cases. The observed significant correlations are weak correlations, BMI explains only up to 5% of the total variability of the gazing attribute. It became clear that gazing behavior is influenced by many factors like emotional status of the tested individual, the surrounding and the sequence of pictures. However, so far it is not clear why there are significant differences only with selected food products and in selected gazing attributes.

1. Einleitung

Was ist Übergewicht? Ab wann spricht man von Adipositas? Ist Übergewicht genetisch bedingt? Zu wie viel Prozent ist die betroffene Person selbst daran schuld? Essen sie zuviel kaloriendichte Lebensmittel? Sind diese attraktiver für Adipöse als für Nichtadipöse? Erkennt man Adipöse eventuell schon daran, dass sie lange und oft auf kalorienreiche Lebensmittel blicken?

Diese und weitere Fragen zu Übergewicht und Adipositas beschäftigen viele Menschen, sowohl Betroffene, als auch Wissenschaftler.

Vor allem im Frühling werden in vielen Magazinen und Journalen die besten Abnehm-Methoden beschrieben. Die Zahl der übergewichtigen Personen auf der Erde steigt. Gerade in der westlichen Welt sind Adipositas und Übergewicht sehr stark verbreitet. Übergewicht und Adipositas stellen für viele Menschen ein Problem dar. Die Qualität des Lebens und der Stand in der Gesellschaft werden durch ihre Körperformen und den Fettanteil ihres Körpers stark beeinflusst.

Die Kilos zu viel auf der Waage haben bekannterweise Langzeitfolgen, sind verantwortlich für das metabolische Syndrom oder auch für psychische Probleme und stellen einen Einflussfaktor für viele chronische Krankheiten und einige Krebserkrankungen dar.

Viele Forscher und Ärzte möchten der Adipositasproblematik auf den Grund gehen, da die gesellschaftliche Relevanz auf der Hand liegt. Es gibt daher eine Vielzahl an Studien und Arbeiten, die sich mit Adipösen bzw. Übergewichtigen beschäftigen.

In dieser Arbeit wird ein neuer Untersuchungsansatz gewählt, es geht um das Blickverhalten von Frauen in Bezug auf Lebensmittel. Es wurde das Blickverhalten adipöser und nicht-adipöser Frauen untersucht. Einleitend wird in dieser Arbeit die Situation adipöser Erwachsener und Kinder dargestellt. Danach werden mögliche Ursachen für Übergewicht diskutiert. Darauffolgend wird erklärt, ab wann von Adipositas bzw. Übergewicht gesprochen werden kann und welche Arten von Fettmessungen es gibt.

Die in dieser Arbeit beschriebenen Versuche wurden mittels Eye Tracking durchgeführt. Auf diese Methode und ihre Funktion wird später genau eingegangen. Anschließend werden Versuchsdesign, -aufbau, -durchführung, -ergebnisse und Einflussgrößen beschrieben. Nach der Darstellung der Resultate folgt ihre Interpretation und abschließend eine Zusammenfassung.

2. Zielsetzung und Aufgabenstellung

Es soll geprüft werden, welche Unterschiede es im Blickverhalten von adipösen, übergewichtigen, normalgewichtigen und untergewichtigen Frauen in Bezug auf Lebensmittel gibt. Ziel der Arbeit ist es, herauszufinden, ob adipöse Frauen anders auf Lebensmittel unterschiedlicher Energiedichte blicken als nicht-adipöse. Diese Fragestellung wird mit Hilfe von Eye Tracking untersucht.

3. Allgemeine Grundlagen

3.1 Adipositas

3.1.1 Allgemeines

Adipös (fettsüchtig) sind Personen, deren Körperfettanteil im Verhältnis zu der Gesamtkörpermasse erhöht ist.[53] Bei etwa 95 Prozent der an Fettsucht Erkrankten beruht der erhöhte Fettanteil auf einem falschen Lebensstil. Die Betroffenen essen Lebensmittel, die pro Gewichtseinheit einen hohen Energiegehalt aufweisen. Das sind vor allem fett- und zuckerhaltige Nahrungsmittel, sowie Softdrinks, Säfte und alkoholische Getränke. Allgemein kann gesagt werden, dass Adipöse grundsätzlich Fett, nicht Zucker bevorzugen.[1]

Die Sättigung wird aber nicht über die Energiedichte, sondern vor allem über die Nahrungsmenge reguliert.[2] Und diese hat sich im Vergleich zu früher vergrößert.[3,4] Diese Tatsache hat natürlich eine erhöhte Gesamtenergieaufnahme zur Folge.[5]

3.1.2 Situation in Österreich

Allgemein kann gesagt werden, dass „Herr und Frau Österreicher" zu wenig Kohlenhydrate aufnehmen, die Zuckerzufuhr aber zu hoch ist. Die Aufnahme an Ballaststoffen ist aber wiederum zu niedrig. Außerdem ist die Gesamtfettaufnahme zwar rückläufig, dennoch ist sie immer noch zu hoch. Die Zufuhr an gesättigten Fettsäuren ist zu hoch, jene an ungesättigten zu niedrig. Die Cholesterinzufuhr ist mit über 300 mg pro Tag ebenfalls zu hoch. Die Proteinversorgung ist ausreichend. Allerdings stammen zwei Drittel der Proteine aus tierischen Quellen, das führt wiederum zur Zufuhr von zu viel Fett und damit zu vielen gesättigten Fettsäuren.[6] Man kann hier von einem Teufelskreislauf sprechen: Die Menschen essen zu viel tierisches Eiweiß, was gleichzeitig auch zur Aufnahme von zu viel tierischem Fett führt. Dies hat eine erhöhte Zufuhr von gesättigten Fettsäuren zur Folge.

3.1.3 Ursachen und „gute" bzw. „schlechte" Nahrungsmittel

Es hat unterschiedliche Ursachen, warum Menschen an Übergewicht leiden.[7] Faktoren, die mit Übergewicht und Adipositas assoziiert werden, sind unter anderem die Veranlagung (Genetik), die Stilldauer im Säuglingsalter, die Ernährungsgewohnheiten, die Esskultur, die Art der Nahrungsmittel, die Herstellungsweisen der Nahrungsmittel[8], die Schichtzugehörigkeit, der Bildungsstand, der Bewegungsmangel[9,10], die sitzende Verhaltensweise und der TV-Konsum.[11]

Es gibt viele Studien, die sich mit den Ursachen für Übergewicht beschäftigen bzw. beschäftigt haben. Laut einer Studie der Universität Cambridge ist das Auftreten von Adipositas von der Ernährung, die ein Baby in den ersten Monaten erhält, abhängig. Aus der Studie lässt sich ableiten, dass eine kalorienreiche Ernährung am Anfang unseres Lebens das Risiko, später an Adipositas zu erkranken, erhöht.[12]

Ein internationales Wissenschaftlerteam vom Göttinger Max-Planck-Institut für biophysikalische Chemie sowie von den National Institutes of Health (Bethesda, USA)[13], führte ebenfalls eine Studie über Adipositas durch. Ihm gelang es, in der Taufliege Drosophila melanogaster eine Vielzahl neuer Gene zu identifizieren, die in Abhängigkeit vom Ernährungszustand des Insekts den Fettaufbau und -abbau regulieren.[14] Dazu führten die Wissenschaftler im Erbgut der Taufliege ein systematisches Screening mittels RNA Interferenz (RNAi)-Technik durch.[15] Überschüssiges Fett wird in kleinen Lipidtröpfchen in der Zelle zwischengespeichert und kann in Hungerzeiten wieder mobilisiert werden. Ist die Regulation von Fettaufbau und Fettabbau gestört, sind Übergewicht und Adipositas die Folge.

Ein Überangebot an energiereichen Nahrungsmitteln, kombiniert mit zu wenig Bewegung, sind entscheidende Faktoren, die zu Fettleibigkeit führen können. Doch trotz eines ähnlichen Lebensstils kann die Gewichtszunahme von Mensch zu Mensch enorm variieren, was auf eine genetische Prädisposition hinweist.

Eine weitere Ursache für Übergewicht ist, dass oft nicht mehr gemeinsam gegessen wird und somit Essen nicht als gemeinsamer Treffpunkt für die Familie und gleichzeitig als Chance zur Ernährungserziehung dient.[16]

Sogenannte „restrained eater“ verbieten sich selbst, bestimmte „schlechte“ Lebensmittel zu essen. Ist die Versuchung zu groß, verfallen sie dieser einen Sorte von Nahrung und essen massenweise davon.[17]

Was macht ein Lebensmittel aber nun gesund bzw. ungesund? Menschen kategorisieren die Nahrung entweder in gut oder schlecht.[18] Es gibt somit in den Köpfen vieler Menschen keinen schleichenden Übergang zwischen Lebensmitteln, die die Gesundheit fördern bzw. negativ beeinflussen.[19,20] Viele Menschen unterteilen die

Nahrung auf Grund ihrer Menge an Mineralstoffen und Vitaminen. Nach dem Motto „An apple a day, keeps the doctor away.“ – „Ein Apfel pro Tag hält den Doktor fern.” Lebensmittel, die große Mengen an Zucker, Fett und / oder Salz enthalten, haben einen schlechten Ruf und werden als „Vitaminkiller“ bzw. schlechtes Essen eingestuft.[21,22,23,24] Zucker wird überhaupt als schädlich eingestuft.[25,26] Nach dem Motto „Du bist, was du isst.“ werden fetthältige Lebensmittel jeder Art als schlecht gesehen, da sich das Fett in der Nahrung in Körperfett umwandelt.[27]

Abgesehen von Fett, Zucker und Salz werden auch Kohlenhydrate von manchen in letzter Zeit als ebenfalls problematisch eingestuft. Obwohl Kohlenhydrate zu den Hauptnährstoffen in der Nahrung zählen und laut Empfehlungen 50 bis 60 Prozent des Gesamtenergiebedarfs ausmachen sollten[28], sind sie in letzter Zeit in Verruf geraten. Beeinflusst wurde die Bevölkerung durch das Aufkommen bestimmter Diäten[29,30], wie zum Beispiel die Low-Carb-Diät, zu denen die Atkins-Diät, die Glyx-Diät, die Montignac-Methode, … dazugehören.[31]

Weiters wird auch diskutiert, dass adipöse Leute bevorzugt kalorienreiche Lebensmittel essen. Es gibt bereits mehrere Studien, die zeigen, dass übergewichtige Menschen eine Präferenz für kalorienreiche Lebensmittel haben.[32,33,34,35] Ein Experiment mit einem IAT (Impliziter Assoziationstest), der die implizite Einstellung gegenüber einem Konzept im Vergleich zu einem anderen Konzept misst[36], zeigt, dass es keinen Zusammenhang zwischen gesunden bzw. ungesunden Lebensmitteln und dem Essverhalten von normal- bzw. übergewichtigen Kindern gibt. Es wurden in Hinblick darauf keine Gruppenunterschiede gefunden.[32]

Bei einer weiteren Studie ging es darum, dass die Probanden eine Liste von ihren Lieblingslebensmitteln aufschrieben. Während übergewichtige Männer vor allem fettreiche und fett-eiweißreiche Lebensmitteln angaben, listeten übergewichtige Frauen süße bzw. kohlenhydrat-fettreiche Lebensmittel auf.[34]

Eine weitere Studie hat sich mit der Frage beschäftigt, ob übergewichtige Kinder im Vergleich zu einer Kontrollgruppe mehr von ungesunden Lebensmitteln als von gesunden angesprochen werden.[37] Das Ergebnis war, dass Kinder mit Übergewicht sowohl ungesundes als auch gesundes Essen mögen und gerne essen, während die Kontrollgruppe neutrale Meinungen dazu hatte.

Laut einer anderen Studie kann man nicht davon ausgehen, dass sich adipöse Kinder oder Jugendliche grundsätzlich in der Art der Lebensmittelauswahl von Normalgewichtigen unterscheiden. Das Ergebnis zeigte, dass alle Gruppen zu wenig Obst, Gemüse und Salat zu sich nahmen, die Adipösen aber wesentlich größere Mengen aßen.[38]

Wissenschaftler der Abteilung für Radiologie der Berliner Charite haben Versuche mit rund 16.000 Teilnehmern[39] gemacht und berichteten beim Europäischen Radiologenkongress im Austria Center Vienna[39], dass Übergewichtige von ihrem „Belohnungssystem im Gehirn“[39] ausgetrickst werden. Mit Hilfe einer Magnetresonanztomographie (MRI), nämlich durch die funktionelle Magnetresonanztomographie (fMRI), versuchten die Forscher[39] herauszufinden, ob es bei fettleibigen Menschen schon beim „Anblick von Speisen zu einer Ausschüttung der Glückshormone Dopamin und Serotonin“[39] kommen könnte. Mit fMRI ist es möglich, die Gehirnstromveränderungen bei Bewegung, Wahrnehmungen und kognitiven Prozessen zu messen.[40] Es wurden Tests mit schwer übergewichtigen und normalgewichtigen Frauen gemacht, denen Fotos von Speisen mit unterschiedlichem Kaloriengehalt gezeigt wurden. Das Ergebnis war, dass vor allem kalorienreiche Speisen Gehirnregionen bei adipösen Leuten aktivierten, die bei den Normalgewichtigen nicht stimuliert wurden. Bei den Übergewichten wurde nämlich sowohl das primäre Geschmackszentrum als auch Regionen, die dem Belohnungssystem zugeordnet sind, stimuliert.[39]

Adipositas und Drogenmissbrauch zeigen ähnliche Muster[41,42,43], was die Aktivität der benötigten Gehirnregionen betrifft. So wie Drogenabhängige haben adipöse Personen verminderte Dopamin-Rezeptoren in ihrem Striatum.[44] Ein Teil des Striatums, eines Bereichs im Großhirn, ist zuständig für den Antrieb, etwas zu essen,[43] und hält das Verlangen nach jenem Energiebedarf konstant, den der Mensch für sein Überleben braucht[45]. Der andere Teil spielt eine Rolle beim Auslösen eines Glücksgefühls nach dem Essen.[46,47,48,49] Laut der Publikation von Rothemund werden beim Anblick energiedichter Nahrung bei Übergewichtigen weitere folgende Bereiche im Gehirn aktiviert: die vordere Insel (anterior insula), ein eingesenkter Teil der Großhirnrinde, die Vormauer (claustrum), ein Teil des Endhirns, das posteriose Cingulum (posterior cingulate), der postzentrale und lateral orbitofrontale Cortex (postcentral und lateral orbitofrontal cortex). Diese Publikation war auch wesentlich Anregung für die vorliegende Arbeit, denn der Schluss liegt nahe, dass das Blickverhalten von Personen von den Emotionen beeinflusst wird, die bei der Betrachtung der jeweiligen Objekte entstehen.

3.1.4 Adipositas bei Erwachsenen

Laut österreichischem Adipositasbericht aus dem Jahre 2006 sind 20 bis 64 Prozent der Männer und 20 bis 40 Prozent der Frauen übergewichtig. 3 bis 23 Prozent der Männer und 2 bis 24 Prozent der Frauen sind adipös.[50] Mit zunehmendem Alter ist ein Anstieg der Prävalenz von Übergewicht und Adipositas feststellbar. Erst ab dem Alter von etwa 65 Jahren dreht sich dieser Trend um.[6]

Weltweit sind über eine Milliarde Menschen übergewichtig und über 300 Millionen adipös. USA ist der Staat mit der höchsten Prävalenz. Dort sind 35 Prozent der Bevölkerung übergewichtig und 31 Prozent adipös. In Europa sind 10 bis 20 Prozent der Männer und 10 bis 25 Prozent der Frauen adipös.[50]

Es gibt kaum Länder, in denen die Häufigkeit des Auftretens von Übergewicht und Adipositas nicht steigt. In Österreich stieg die Adipositasprävalenz von 1991 bis 1999 von 8,5 auf 9,1 Prozent.[50]

Bei diesen Statistiken muss aber beachtet werden, dass sowohl die österreichischen als auch die internationalen Daten Schwächen und Limitierungen, wie z. B. fehlende Repräsentativität der Daten, unterschiedliche Datengenerierung (selbstberichtet bzw. gemessen), unterschiedliche Klassifikationen, Verzerrungen verschiedener Ursachen,… aufweisen und damit mit Vorbehalt zu interpretieren und zu vergleichen sind.[50]
Den höchsten Anteil an Adipösen findet man sowohl bei Frauen als auch bei Männern im Alter zwischen 45 und 75 Jahren. Die Prävalenz sinkt mit zunehmender Schulbildung. Den niedrigsten Anteil an Adipösen haben Hochschulabsolventen, den höchsten hingegen Pflichtschulabsolventen.[51]

Was den Unterschied zwischen Männern und Frauen in Hinblick auf Übergewicht betrifft, ist erwähnenswert, dass Frauen häufiger Zwischenmahlzeiten konsumieren als Männer. Außerdem nehmen Männer, sowohl in der Altersgruppe der Kinder und Jugendlichen, als auch der Erwachsenen, mehr Energie, Fett und Cholesterin, aber weniger Kohlenhydrate und Ballaststoffe als Frauen auf.[52]

3.1.5 Adipositas bei Kindern und Jugendlichen

Unter österreichischen Kindern und Jugendlichen sind 10 bis 29 % der Burschen und 6 bis 42 % der Mädchen übergewichtig und 5 bis 11 % der Burschen und 3 bis 4 % der Mädchen adipös.[50] Anders als bei den Erwachsenen ist hier die Prävalenz der Adipositas in fast allen verfügbaren Untersuchungen bei den Burschen höher. Eine besonders hohe Prävalenz von Übergewicht und Adipositas findet man bei Wiener Lehrlingen, insbesondere bei den weiblichen.[50]

Weltweit sind 22 Millionen Kinder unter 5 Jahren adipös. 155 Millionen der 5 bis 17-Jährigen sind übergewichtig, davon 30 bis 45 Millionen adipös. Die Regionen mit den höchsten Prävalenzen sind Amerika und Europa.

3.2 Arten der Fettmessungen

3.2.1 BMI

Es gibt mehrere Arten, wie man feststellen kann, ob es sich um Adipositas handelt. Die Weltgesundheitsorganisation hat 1997 die Definition von Fettsucht anhand des Body-Maß-Index (BMI) festgelegt.[53]

Dieser errechnet sich durch:

$$BMI = \frac{\text{Körpergewicht in Kilogramm [kg]}}{\text{Körperhöhe in Metern zum Quadrat [m}^2\text{]}}$$

Formel 1: BMI [56]

In der Tabelle 1 sind die Bezeichnungen der fünf BMI-Gruppen aufgelistet.[54,55] Ab einem BMI von 30 wird von Adipositas gesprochen.

Tabelle 1: BMI und Gewicht

BMI [kg/m²]	Gewicht
< 18,5	Untergewicht
19,5/20 – 24,9	Normalgewicht
25 – 29,9	Leichtes bis mittleres Übergewicht (Präadipositas)
30 – 39,9	Deutliches Übergewicht (Adipositas; krankhaft)
> 40	starkes Übergewicht (schwere Adipositas)

3.2.2 Fettmessung bei Kindern

Übergewicht und Adipositas werden im Erwachsenenalter gemäß der WHO durch BMI-Werte über 25 (für Übergewicht) und über 30 kg/m² (für Adipositas) definiert. Im Kindes- und Jugendalter hat die Arbeitsgemeinschaft Adipositas in Deutschland im Kindes- und Jugendalter Schwellenwerte, die auf Querschnittsstudien beruhen, für die beide Krankheiten vorgeschlagen.[56]

Bei Kindern erfolgt die Einteilung von Normal-, Über- und Untergewicht nach den Perzentilkurven des BMI. Das jeweilige Perzentil gibt an, wie viel Prozent der gleichaltrigen Kinder gleichen Geschlechts einen niedrigeren BMI-Wert aufweist.[56]

Übergewicht wird definiert ab dem Überschreiten der 90. Perzentile, von Adipositas wird ab der 97. Perzentile gesprochen.[2] Die Perzentilkurven für Knaben und Mädchen sind in den nachfolgenden Diagrammen abgebildet.

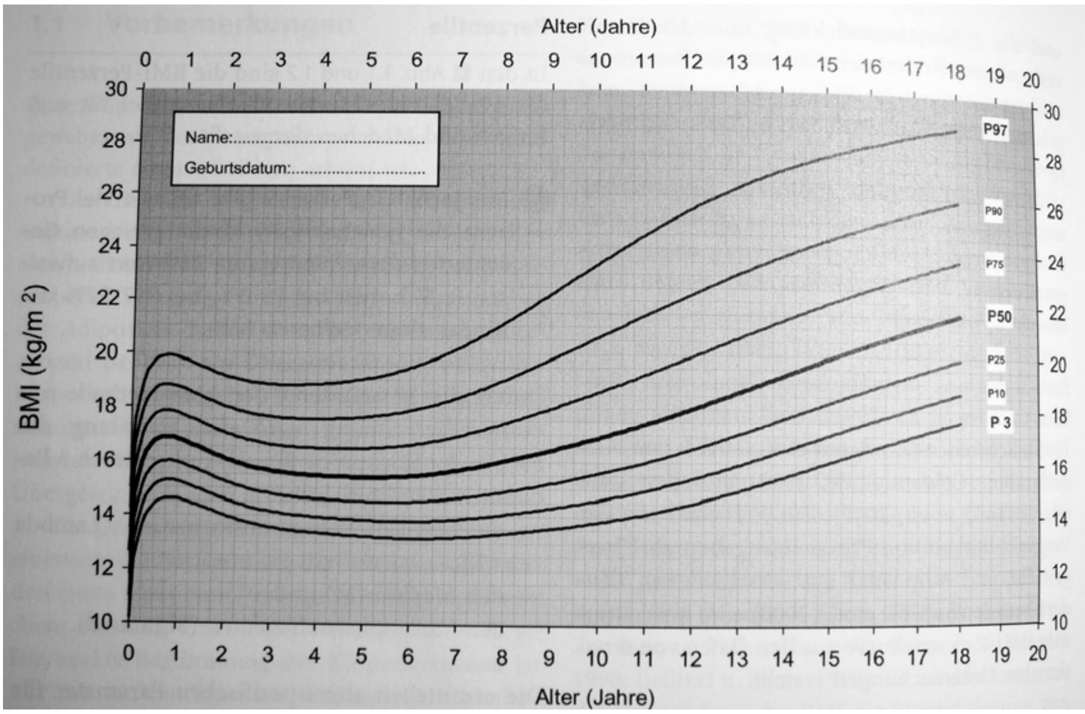

Abbildung 1: Percentile für den Body-Maß-Index für Jungen von 0 bis 18 Jahren[56]

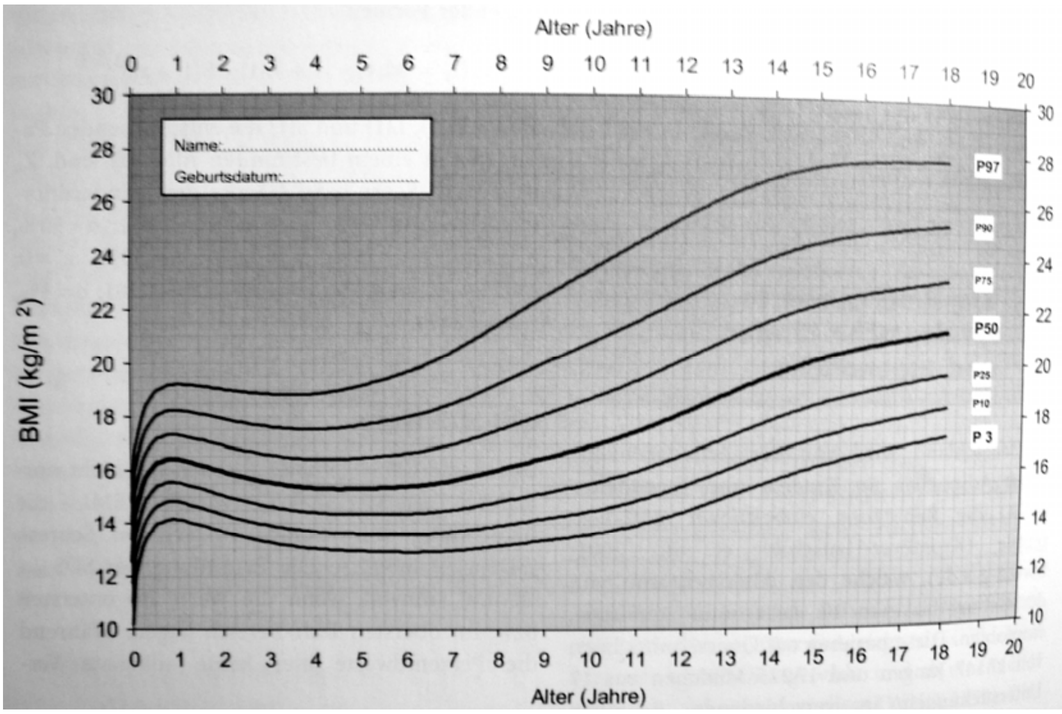

Abbildung 2: Percentile für den Body-Maß-Index für Mädchen von 0 bis 18 Jahren[56]

3.2.3 Weitere Arten zur Fettmessung

Der BMI ist ein Maß für die Körperfettmasse. Ebenso wichtig ist der Taillenumfang, der ein Maß für das intraabdominale (viszerale) Fett darstellt. Wird zusätzlich der Hüftumfang gemessen, kann das Taillen-Hüft-Verhältnis ermittelt werden.[2]

Eine weitere Methode ist die Hautfaltendickenmessung, bei der mit Hilfe einer Zange die subkutane Fettschichtdicke an verschiedenen Körperstellen gemessen und danach mit Werten aus Tabellen verglichen wird.

Bei der BIA-Methode, der Bioelektrischen Impedanzanalyse, wird der elektrische Wechselstromwiderstand im Körper gemessen. Weitere Methoden wären die X-ray-Absorptionsmetrie, bei der Gadolinium-Photonen im Körper unterschiedlich abgeschwächt werden, die Hydrodensitometrie, das Unterwasserwiegen und die Computer- bzw. Magnetresonanztomografie.[2]

3.3 Eye Tracking

3.3.1 Arten von Blickbewegungen

Mittels Eyetracker werden die Blickbewegungen einer Person registriert und aufgezeichnet. Grundsätzlich unterscheidet man zwei Arten von Blickbewegungen, die Fixation und die Sakkaden.

Bei der Fixation werden bestimmte Punkte im Raum fokussiert, die Augen sind dabei nicht in Ruhe, sondern es treten kleinere, unwillkürliche Augenbewegungen auf. Sakkaden hingegen sind Blickwechsel, also kurzzeitige Sprünge von einer Fixation zur nächsten. Während einer Sakkade erfolgt keine Informationsaufnahme. Die Augenbewegungen erfolgen dabei sehr schnell und ruckartig.[57]

3.3.2 Eye Tracking - Methoden

Es werden verschiedene Formen von Eyetrackern unterschieden, nämlich Überkopfsysteme und ferngesteuerte Systeme bzw. gibt es auch mehrere Verfahren zur Aufzeichnung, wie z. B. die Cornea-Reflex-Methode, die Aufnahme von Elektrookulogrammen und die Kontaktlinsenmethode.

Überkopfsysteme werden am Kopf der Versuchsperson befestigt. Sie enthalten neben dem Gerät zur Erfassung der Blickbewegung eine Szenenkamera, die in der Regel das Sichtfeld des Probanden aufzeichnet. Im Gegensatz dazu ist der Eyetracker bei ferngesteuerten Systemen nicht mit der Versuchsperson verbunden, sondern die Aufzeichnung erfolgt berührungsfrei, z.B. durch Infrarotlicht.

Bei der Cornea Reflex Methode wird ein schwacher Infrarot-Lichtstrahl aus kurzer Distanz vom Eyetracker auf das Auge gerichtet. Nach einer kurzen Kalibrierung wird ein Bild oder eine Abfolge von Bildern gezeigt.[59] Eingebaute Sensoren zeichnen die Augenbewegungen auf und rechnen diese auf das angezeigte Bild um. So entsteht eine Art Wärmebild, das die betrachteten Bereiche in verschiedenen Farben je nach Intensität aufzeichnet.[58] Bei Elektrookulogrammen misst man die elektrischen Spannung zwischen Netzhaut (negativer Pol) und Hornhaut (positiver Pol). Die Reflexion von verspiegelten Kontaktlinsen wird per Kamera bei der Kontaktlinsenmethode aufgezeichnet.[59,60]

3.3.3 Anwendungen von Eye Tracking

Eye Tracking gibt es bereits seit über 40 Jahre, seit einigen wenigen Jahren wird es für kommerzielle Bereiche genutzt.[62] Im Bereich Marktforschung zum Beispiel kann analysiert werden, welche Produkt-Designs besonders auffällig oder welche Bereiche eines Werbeposters als Eye-Catcher wirksam sind. Visuelle Informationen sind bei Menschen grundsätzlich von großer Wichtigkeit.[61]

Laut Food Standards Agency (FSA) kann mit einer Eye Tracking Maschine auch gemessen werden, worauf Konsumenten beim Einkaufen wirklich schauen.[62] Bei einem Pilotversuch wurde das Ergebnis erzielt, dass bestimmte Bevölkerungsgruppen auf gewisse Produkte öfter und länger schauen.[62] Es wurde herausgefunden, dass Kunden auf die Kennzeichnung des Produkts achten, wenn sie einen bestimmten Zweck verfolgen, z. B. wenn sie diätetische Lebensmittel kaufen wollen. Steckt keine Absicht dahinter, ein bestimmtes Produkt zu kaufen, beruht die Entscheidungsfindung der Konsumenten auf anderen Kriterien als der Kennzeichnung. Das ungerichtete Suchverhalten zeigt eine große Menge an visuellen Aktivitäten vor dem Kauf.

3.3.4 Messparameter von Eye Tracking - Untersuchungen und ihre Interpretation

Area of Interests:

Area of Interests können definiert werden, um zu überprüfen, wie viel visuelle Aufmerksamkeit einzelne Bildbereiche auf sich ziehen.

Time to first Fixation:

Hier wird die Zeit in Sekunden, von Beginn des Konfrontation mit dem Bild bis zur ersten Fixation innerhalb einer Area of Interests, gemessen.

Fixation Length:

Die Fixation Length ist die Zeitdauer einer Fixation in Sekunden innerhalb einer AOI.

Fixation Count:

Der Fixation Count ist ein Maß für die Anzahl der Fixationen innerhalb einer AOI .

Observation Length:

Die Observation Length gibt die komplette Zeit in Sekunden an, während der sich die Prüfperson innerhalb einer AOI befindet, beginnend bei der Fixation innerhalb der AOI und endend mit einer Fixation außerhalb der AOI.

Observation Count:

Der Observation Count gibt an, wie oft eine Prüfperson, auch mit Unterbrechungen, eine AOI anschaut.

Fixation Before:

Der Fixation Before – Wert gibt die Anzahl der Fixationen an, bevor die Versuchsperson Bereiche innerhalb einer AOI zum ersten Mal fixiert.

Heat Map:

Mit der Funktion Heat Map kann optisch nachvollzogen werden, welche Bereiche des Bildes wie lange betrachtet werden. Die Darstellung erfolgt durch unterschiedliche

Farbtöne. In der Tobii Eye Tracking Software steht Rot für lange Blickdauer, Gelb für mittlere und grün für kurze Blickdauer.

4. Material und Methoden

4.1 Versuchsdesign

4.1.1 Vorbereitung

Die Lebensmittel und Nicht-Lebensmittel wurden mit einer digitalen Spiegelreflexkamera Canon EOS 400 fotografiert.

Abbildung 3: Fotografieren der Lebensmittel und anderer Objekte mit der Spiegelreflexkamera

Anschließend wurden die Bilder mit Photoshop bearbeitet und ungefähr auf die gleiche Fläche gebracht. Danach wurden die Bilder ins Eye-Tracking-Programm übertragen.

4.1.2 Vorversuche

Für den ersten Vorversuch wurden sowohl weibliche, als auch männliche Probanden herangezogen. Nach einer 6-Punkt-Kalibrierung wurden den Versuchspersonen zehn Bilder gezeigt, sechs Non-Food-Bilder (Abbildung 4, Abbildung 5, Abbildung 7, Abbildung 8, Abbildung 11, Abbildung 12) und vier Bilder mit Lebensmitteln (Abbildung 6, Abbildung 9, Abbildung 10, Abbildung 13). Die Bilder zeigten in simpler, minimalistischer Darstellung jeweils zwei Objekte. Den Prüfpersonen wurde erklärt, dass es sich um einen Erinnerungstest handle und sie sich die gezeigten Objekt ins Gedächtnis einprägen sollten.

Folgende Reihenfolge der Objekte wurde gewählt: 2 Non Food (Tischdekorationskugel und Kerze bzw. Mörser und Taschenrechner), 1 Food (Banane und Schokolade), 2 Non Food (Büchlein und Handschuh bzw. Stanleymesser und Stift), 2 Food (Schnitzel und Kartoffelsalat bzw. Walnüsse und Weintrauben), 2 Non Food (Handy und Locher bzw. Venus von Willendorf-Figur und Geodreieck), 1 Food (Gurke und Speck). Nach jedem Bild bekamen die Probanden ein Zwischenbild mit einem Kreuz in der Bildschirmmitte zu sehen, damit ihr Augenbewegungen beim jeweils neuen Bild immer von der Mitte ausgehen.

Nach dem ersten Probeversuche wurde die Größe und der Kontrast von manchen Bildern verändert und auch die Zeit zum Betrachten der Bilder vergrößert.

Beim zweiten Testversuch wurden die Bilder den Versuchspersonen je 10 Sekunden, das Zwischenbild je 2 Sekunden gezeigt. Die Abbildung 4 bis Abbildung 14 zeigen die Bilder, die den Probanden vorgeführt wurden.

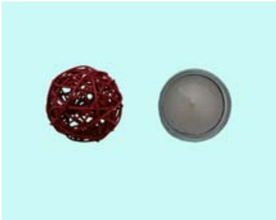

Abbildung 4: Tischdekorationskugel und Kerze

Abbildung 5: Mörser und Taschenrechner

Abbildung 6: Banane und Schokolade

Abbildung 7: Büchlein und Handschuh

Abbildung 8: Stanleymesser und Stift

Abbildung 9: Schnitzel und Kartoffelsalat

Abbildung 10: Walnüsse und Weintrauben

Abbildung 11: Handy und Locher

Abbildung 12: Venus von Willendorf-Figur und Geodreieck

Abbildung 13: Gurke und Speck

Abbildung 14: Zwischenbild

Da die Lebensmittel unzufriedenstellendes Aussehen hatten, wurden sie ausgetauscht und durch neue ersetzt. Außerdem wurde die Reihenfolge geändert, und es wurden fünf Food-Bilder und fünf Non-Food-Bilder gewählt. Die Abbildung 15 bis Abbildung 25 zeigen die Bilder und die Reihenfolge für den dritten Vorversuch.

Abbildung 15: Mörser und Taschenrechner

Abbildung 16: Tischdekorationskugel und Kerze

Abbildung 17: Banane und Schokolade

Abbildung 18: Büchlein und Handschuh

Abbildung 19: Stanleymesser und Stift

Abbildung 20: Chips und Weintrauben

Abbildung 21: Hamburger und Birne

Abbildung 22: Handy und Locher

Abbildung 23: Praline und Erdbeere

Abbildung 24: Schnitzel und Salat

Abbildung 25: Zwischenbild

4.1.3 Zusammenfassung des Versuchsdesigns

Die Tabelle 2 zeigt eine Zusammenfassung der Vorversuche bzw. des Versuchsdesigns.

Tabelle 2: Zusammenfassung der Vorversuche bzw. des Versuchsdesigns

Nummer	Vorversuch	Änderungen
1	• 6 Non Food Objekte, 4 Food Objekte • Zwischenbild zwischen den Bildern	• Größe • Kontrast • Zeit
2	• Gleiche Reihenfolge wie beim ersten Vorversuch • Dauer der Bilder: je 10 Sekunden • Dauer des Zwischenbildes: 2 Sekunden	• Aussehen der Lebensmittel • Anzahl der Food und Non Food Bilder
3	• 5 Food und 5 Non Food Bilder • Andere Lebensmittel-Bilder	

4.2 Geräte, Programme und Materialien

Folgende Materialien und Geräte wurden für die Versuche verwendet:

- Tablett, auf dem die Objekte fotografiert wurden
- Spiegelreflexkamera: Canon 400 Digital (EFS 18-55mm, EOS Digital)
- Gestell zum Fotografieren
- Computer: Dell Precission T3400
- Bildbearbeitungsprogramm: Adobe Photoshop CS3 und CS2
- Eye Tracking: Tobii 1.2.38
- Fragebogen-Programm: Grafstat

4.3 Methode

4.3.1 Eye Tracking

Nach einer 6-Punkt-Kalibrierung werden Frauen die Bilder in der oben genannten Reihenfolge gezeigt und ihre Augenbewegungen gemessen. Nach diesem Versuch werden die Probandinnen gebeten, einen Fragebogen auszufüllen.

4.3.2 Fragebogen

Da den Versuchspersonen gesagt wird, dass es sich um einen Erinnerungstest handle, wird in der ersten Frage nach Objekten gefragt, an denen sich die Frauen noch erinnern können. Danach folgen statistische Daten (Geschlecht, Alter, Größe, Gewicht, Rechts- und Linkshänder). Die Fragen sieben bis elf beschäftigen sich mit dem Ernährungsverhalten bzw. mit eventuellen Ernährungserkrankungen der Frauen.

Fragebogen: Erinnerungstest

1. An welche Bilder können Sie sich noch erinnern?

____

2. Sind Sie männlich oder weiblich?

   A [ ] männlich B [ ] weiblich

3. Wie alt sind Sie?

   __________Jahre

4. Wie groß sind Sie?

   __________m

5. Wie schwer sind Sie?

   __________kg

6. Sind Sie Rechts- oder Linkshänder?

   A [ ] Rechtshänder B [ ] Linkshänder

7. Was ist Ihre Lieblingsspeise?

   ____

8. Liegt eine besondere Ernährungsweise (vegetarisch, vegan, Rohkost,…) vor?

   A [ ] nein B [ ] ja, und zwar: ____________

9. Meine Ernährungsgewohnheiten wurden vor allem geprägt durch...

   A [ ] meine Eltern. B [ ] die Schule. C [ ] Vorbilder. D [ ] Sonstiges: ____________

10. Liegen Krankheiten wie Zuckerkrankheit (Diabetes) oder eine Über- oder Unterproduktion der Schilddrüse vor?

    A [ ] ja B [ ] nein

11. Haben Sie derzeit Hunger?

    A [ ] ja B [ ] nein C [ ] weiß nicht

Abbildung 26: Fragebogen

4.3.3 Bestimmung der Area of Interests

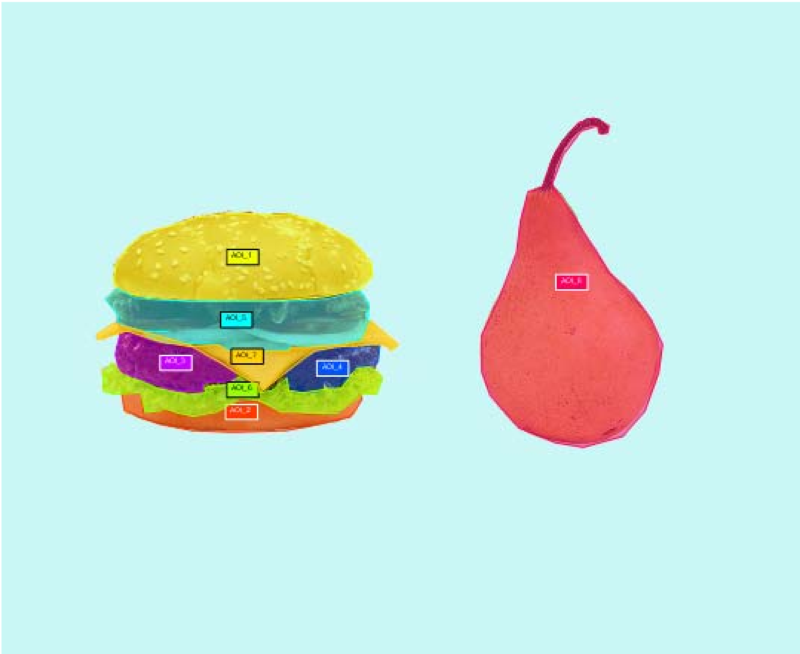

Abbildung 27: AOIs - Hamburger und Birne

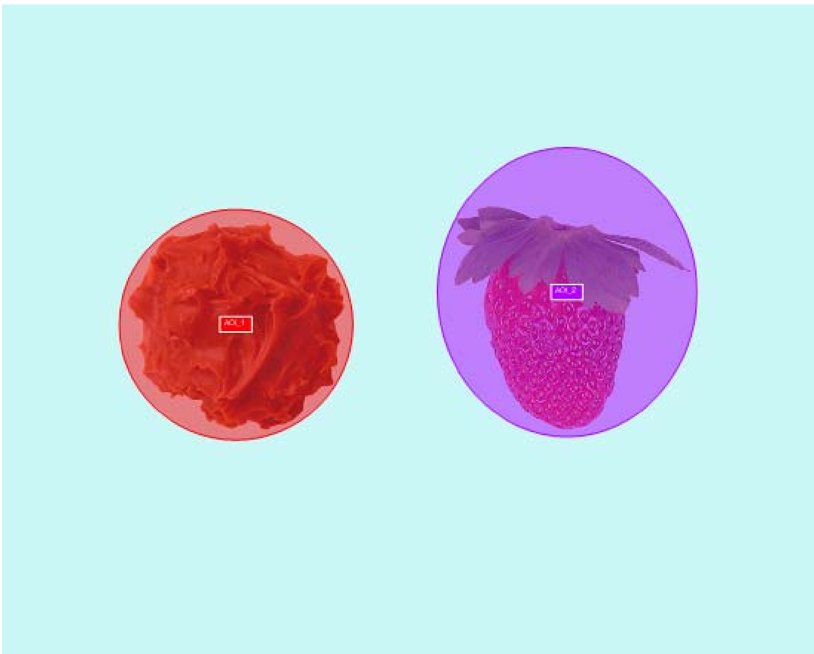

Abbildung 28: AOIs - Praline und Erdbeere

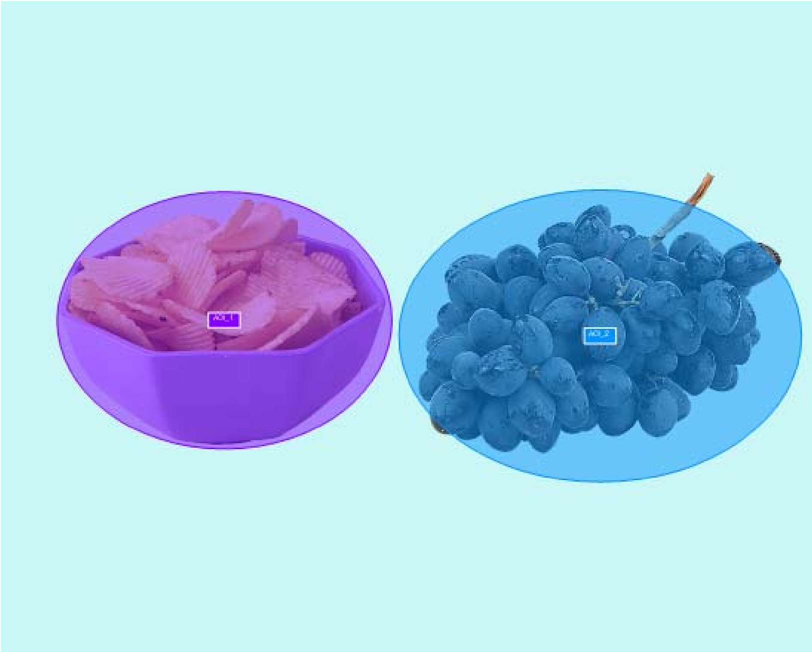

Abbildung 29: AOIs - Chips und Weintrauben

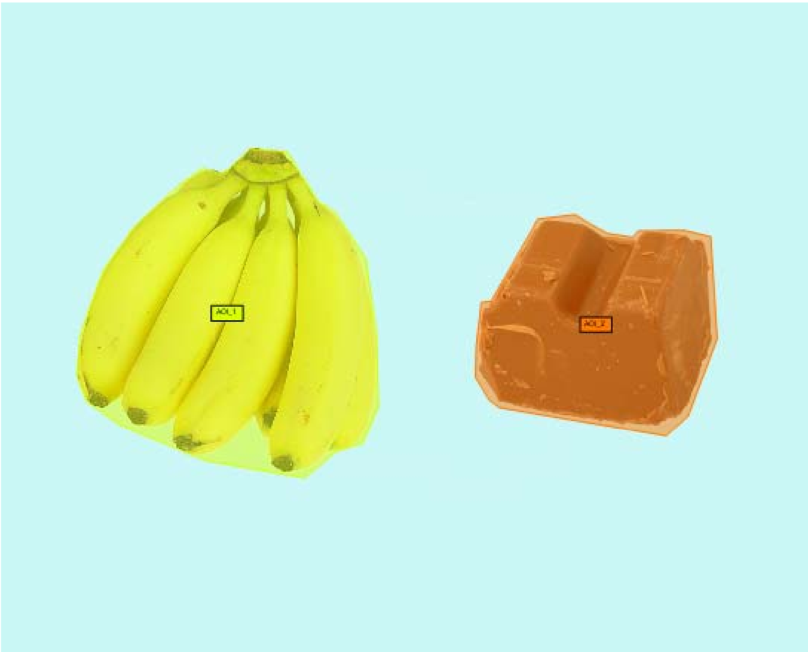

Abbildung 30: AOIs - Bananen und Schokolade

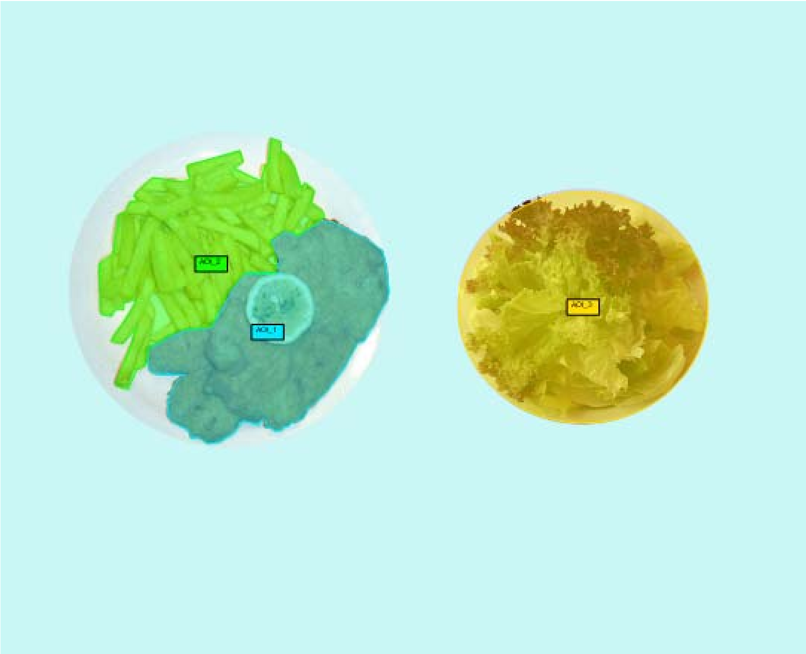

Abbildung 31: AOIs - Schnitzel mit Pommes und Salat

5. Ergebnisse und Interpretation

5.1 Bilder

5.1.1 Heat Map adipöser und untergewichtiger Frauen

Die folgenden fünf Bilder zeigen die Heat Maps von allen getesteten adipösen und untergewichtigen Frauen.

Die Abbildungen 32 bis 41 liefern nur schwache erste Hinweise auf Unterschiede zwischen dem Blickverhalten von Adipösen und Untergewichtigen. Es ist zu erkennen, dass Untergewichtige beim Bild „Hamburger und Birne“ (Abbildung 33) länger als Adipöse auf die Birne, Adipöse hingegen beim Bild „Chips und Weintrauben“ (Abbildung 36) länger als Untergewichtige auf die Chips schauen. Dennoch ist diese eher qualitative Darstellung, die eher intuitiv interpretiert werden muss, nicht wirklich gut geeignet, um kleine quantitative Aussagen über Unterschiede machen zu können.

Abbildung 32: Heat Map - Hamburger und Birne – adipös

Abbildung 33: Heat Map – Hamburger und Birne – untergewichtig

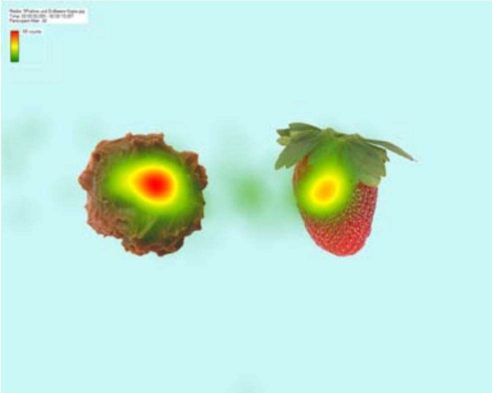

Abbildung 34: Heat Map – Praline und Erdbeere – adipös

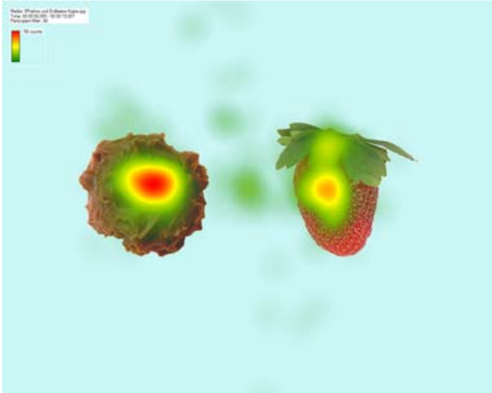

Abbildung 35: Heat Map – Praline und Erdbeere – untergewichtig

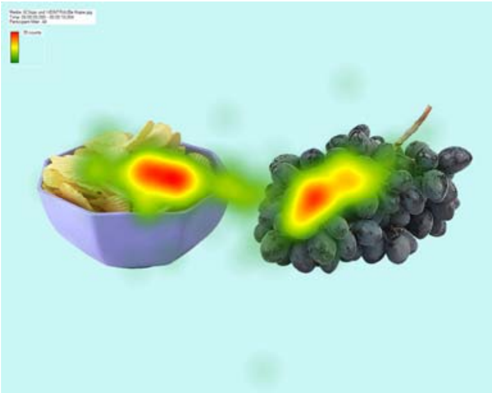

Abbildung 36: Heat Map – Chips und Weintrauben – adipös

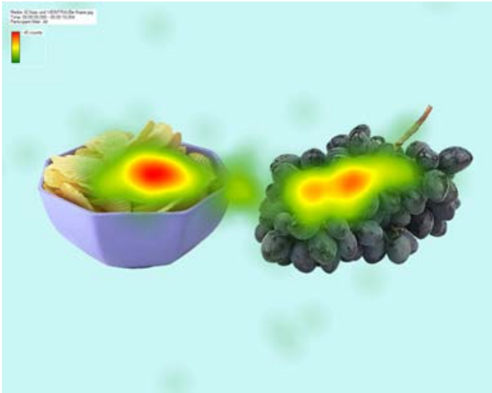

Abbildung 37: Heat Map – Chips und Weintrauben – untergewichtig

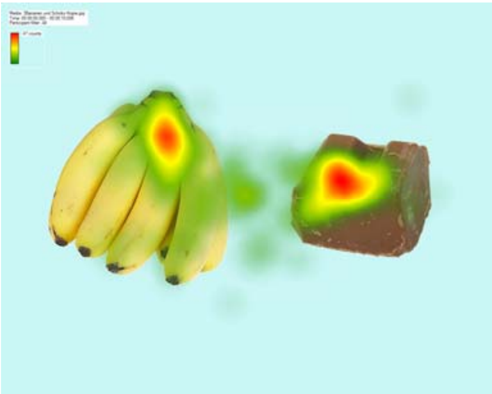

Abbildung 38: Heat Map – Bananen und Schokolade – adipös

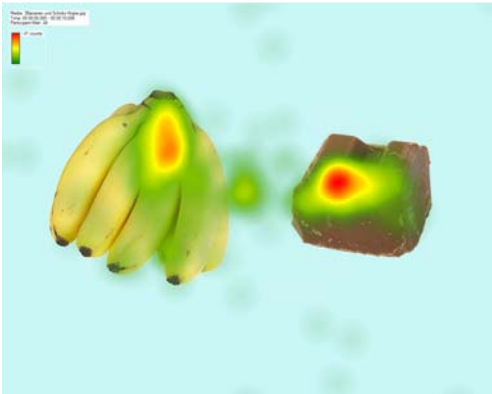

Abbildung 39: Heat Map – Bananen und Schokolade– untergewichtig

Abbildung 40: Heat Map – Schnitzel mit Pommes und Salat – adipös

Abbildung 41: Heat Map – Schnitzel mit Pommes und Salat – untergewichtig

5.2 Zusammenfassung wichtiger Parameter und ihre Interpretation

Auf Grund der Datenmenge befinden sich die Urdaten, die Details zur statistischen Auswertung und alle Grafiken auf der beiliegenden CD.

Folgende Auswertungen werden herausgegriffen und tabellarisch zusammengefasst:

Regressionsanalytische Auswertung:

Als abhängige Variable wird das Verhältnis von Eyetracking-Parameter für das energiedichte Lebensmittel zu Parameter für das nicht energiedichte Lebensmittel gewählt. Als unabhängige Variable wird der BMI definiert. Eine Regressionsanalyse wird mit den Medianen der abhängigen und unabhängigen Variablen, die andere mit den Einzelwerten durchgeführt. Als Basis wird ein lineares Modell (y=a+bx) angenommen.

Das Bestimmtheitsmaß R^2 gibt bei der Regressionsanalyse an, wie viel der Variabilität des abhängigen durch das unabhängige Merkmal bestimmt wird. Der Regressionskoeffizient gibt die Art des Zusammenhanges an. Ist der P-Wert des Regressionskoeffizienten unter 0.05, handelt es sich um einen statistisch signifikanten Unterschied.

Kolmogorov-Smirnov-Test:

Der Kolmogorov-Smirnov-Test prüft, ob sich die Verteilungen zweier Variablen signifikant voneinander unterscheiden. Der Prüfwert P muss unter 0.05 sein, damit ein statistisch signifikanter Unterschied gegeben ist.

Paarweiser Vergleich:

Bei den paarweisen Vergleichen wird geprüft, ob sich das Blickverhalten der Adipösen und der Nicht-Adipösen, also der untergewichtigen, normalgewichtigen und übergewichtigen Probandinnen, bzw. der Adipösen und Untergewichtigen signifikant voneinander unterscheidet. Hierfür wurde der Mann-Whitney-Test herangezogen.

ANOVA:

Ist der P-Wert unter 0.05, handelt es sich um einen statistisch signifikanten Unterschied.

Multipler Vergleich (MV):

Durch den Multiple Range Test wird das Blickverhalten aller Gruppen untereinander verglichen.

5.2.1 Time to first Fixation

5.2.1.1 Zusammenfassung der Ergebnisse

Tabelle 3: Zusammenfassung - Time to first Fixation

Bilder	Time to first Fixation					
	Regressionsanalyse Mediane			Regressionsanalyse Einzelwerte		
	Regressionskoeff.	P-Wert	R² [%]	Regressionskoeff.	P-Wert	R² [%]
Hamburger und Birne	-0,3557	0,7561	5,95	-0,7984	0,4261	0,50
Praline und Erdbeere	0,8245	0,4964	25,37	1,7166	0,0885	2,29
Chips und Weintrauben	-13,7878	0,0052	98,96	-0,7340	0,4652	0,69
Bananen und Schokolade	1,3087	0,3208	46,13	1,9263	0,0564	3,00
Schnitzel mit Pommes und Salat	0,3264	0,7751	5,06	1,7907	0,0757	2,46

Bilder	Time to first Fixation					
	Kolmogorov-Smirnov-Test	Mann-Whitney-Test	Kolmogorov-Smirnov-Test	Mann-Whitney-Test	ANOVA	Multiple Range Test
	P-Wert: Adi. - Nicht adi.	P-Wert: Adi. - Nicht adi.	P-Wert: Adi. - Ug.	P-Wert: Adi. - Ug.	P-Wert	
Hamburger und Birne	0,2443	0,6093	0,1167	0,3144	0,2131	nicht signifikant
Praline und Erdbeere	0,3587	0,4887	0,2257	0,9898	0,7744	nicht signifikant
Chips und Weintrauben	0,4551	0,0416	0,0592	0,1268	0,7342	nicht signifikant
Bananen und Schokolade	0,0345	0,2515	0,5883	0,2130	0,2049	nicht signifikant
Schnitzel mit Pommes und Salat	0,4107	0,5598	0,3930	0,6694	0,5196	nicht signifikant

5.2.1.2 Hamburger und Birne

Die P-Werte der Regressionskoeffizienten betragen über 0.05, somit besteht bei der regressionsanalytischen Betrachtung der Mediane der „Time to first Fixation“ und des BMIs und bei der regressionsanalytischen Betrachtung der Einzelwerte kein signifikanter Zusammenhang.

Der Vergleich mit alternativen Modellen zeigt, dass das lineare Modell am besten geeignet ist, den Zusammenhang zwischen Fett-Nichtfett-Verhältnis und BMI zu beschreiben.

Beim paarweisen Vergleich der adipösen und nicht adipösen bzw. der adipösen und ungewichtigen Versuchspersonen, sowie beim Multiplen Vergleich zeigen sich keine signifikanten Unterschiede.

5.2.1.3 Praline und Erdbeere

Auch bei dieser statistischen Auswertung der „Time to first Fixation“ des Bildes „Praline und Erdbeere“ liegen keine signifikanten Zusammenhänge vor.

5.2.1.4 Chips und Weintrauben

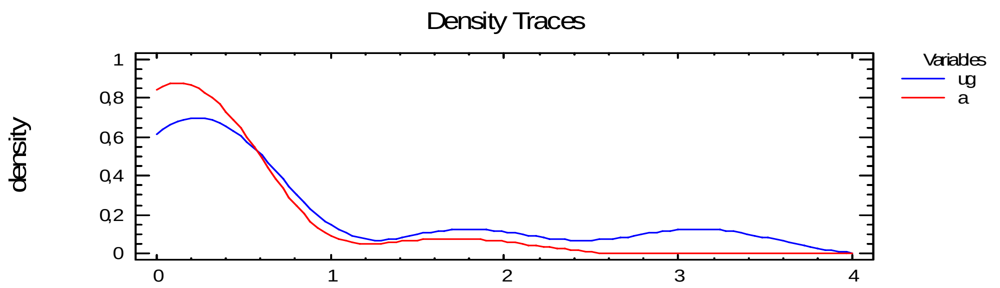

Abbildung 42: Time to first Fixation - Density trace - Chips und Weintrauben - Untergewichtige und Adipöse

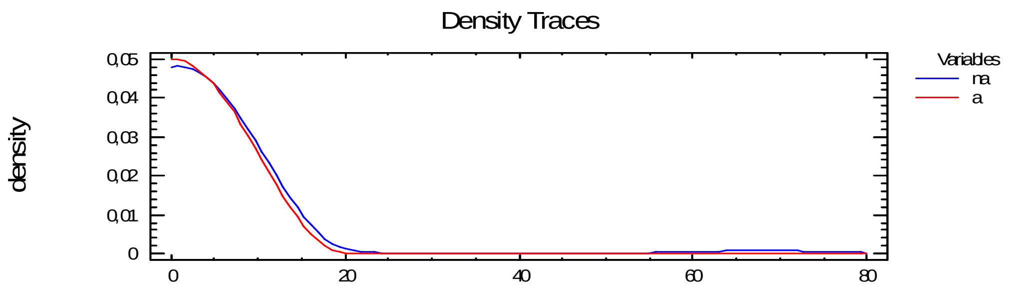

Abbildung 43: Time to first Fixation - Density trace - Chips und Weintrauben - Nicht Adipöse und Adipöse

Bei der Regressionsanalyse der Mediane der „Time to first Fixation“ und des BMIs zeigt sich, dass der Prüfwert unter 0,05 liegt. Es besteht somit ein signifikanter Unterschied zwischen den Medianen der „Time to first Fixation“ und des BMIs. Je niedriger der BMI, desto länger schauen Frauen auf die fettreichere Komponente, in dem Fall auf Chips. Das Bestimmtheitsmaß gibt an, dass fast 100% der Variabilität der Mediane der Wahrnehmung durch den BMI bestimmt wird. Der hochsignifikante Zusammenhang kann bei der regressionsanalytischen Betrachtung der Einzelwerte nicht festegestellt werden. Der Prüfwert des Kolmogorov-Smirnov-Tests zwischen Adipöse und Untergewichtige liegt knapp über 0,05. Man kann somit davon ausgehen, dass sich die

Gruppen (Adipöse und Untergewichtige) voneinander signifikant unterscheiden. Der paarweise Vergleich der Mediane der „Time to first Fixation“ der Adipösen und Nicht-Adipösen zeigt einen signifikanten Zusammenhang, der P-Wert des Mann-Whitney-Tests ist kleiner als 0,05.

In den obigen Abbildungen ist dieser Unterschied zwischen den jeweiligen zwei Gruppen grafisch dargestellt. Es ist zu erkennen, dass in beiden Fällen die Kurve der Adipösen höher als die Kurve der Untergewichtigen bzw. der Nicht-Adipösen liegt.

5.2.1.5 Bananen und Schokolade

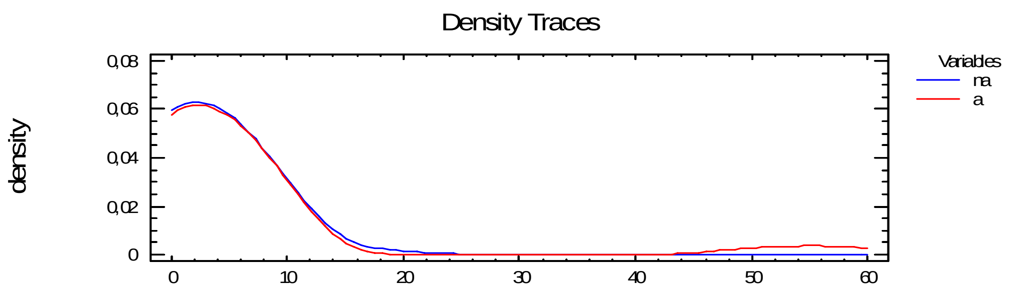

Abbildung 44: Time to first Fixation - Density trace – Bananen und Schokolade - Nicht Adipöse und Adipöse

Es zeigt sich kein signifikanter Zusammenhang zwischen den Medianen der „Time to first Fixation“ und des BMIs. Werden die Einzelwerte regressionsanalytisch untersucht, so liegt der P-Wert knapp über 0.05, man kann in diesem Fall somit von einem signifikanten Zusammenhang ausgehen. Das Bestimmtheitsmaß ist 3%, somit wird 3% der Variabilität der Wahrnehmung durch den BMI bestimmt. Beim Kolmogorov-Smirnov-Test der adipösen und nicht adipösen Frauen zeigt sich ebenfalls ein signifikanter Zusammenhang ($\tilde{x}_a$=2,6 [ ], $\tilde{x}_{na}$=2,0 [ ]). Der paarweise Vergleich zwischen den untergewichtigen und adipösen Versuchspersonen und der Multiple Vergleich weisen keine signifikanten Unterschiede zwischen den Gruppen auf. In Abbildung 44 wird der Unterschied im Blickverhalten der Nicht-Adipösen und der Adipösen dargestellt.

5.2.1.6 Schnitzel mit Pommes und Salat

Es zeigen sich keine signifikanten Zusammenhänge zwischen den Medianen der „Time to first Fixation“ und des BMIs, beim Vergleich der Einzelwerte ist der P-Wert 0,0757.

Ergebnisse und Interpretation

Wird von einem 90%-Konfidenznivau ausgegangen, besteht ein signifikanter Zusammenhang, und es kann gesagt werden, dass der BMI einen Einfluss von rund 2,5% auf die Variabilität der Wahrnehmung hat. Es zeigt sich somit ein ähnliches Ergebnis wie bei den Bildern „Bananen und Schokolade“ bzw. „Praline und Erdbeere“. Bei allen 3 Bildern kann man unter der Voraussetzung eines Konfidenznivaus von 90% von einem signifikanten Zusammenhang sprechen, und außerdem kann gesagt werden, dass der BMI einen Einfluss von ca. 3% auf die Wahrnehmung hat.

Das doppeltreziproke Modell wäre am besten geeignet, den Zusammenhang zwischen der „Time to first Fixation“ und des BMIs aufzuzeigen.

Beim paarweisen Vergleich, beim Mann-Whitney-Test und beim multiplen Vergleich zeigen sich P-Werte von über 0.05, es gibt somit bezüglich der „Time to first Fixation“ keine signifikanten Unterschiede zwischen den Gruppen.

5.2.2 Fixation Length

5.2.2.1 Zusammenfassung der Ergebnisse

Tabelle 4: Zusammenfassung - Fixation Length

Bilder	**Fixation Length**					
	Regressionsanalyse Mediane			Regressionsanalyse Einzelwerte		
	Regressionskoeff.	P-Wert	R² [%]	Regressionskoeff.	P-Wert	R² [%]
Hamburger und Birne	2,6013	0,1214	77,19	0,1260	0,9000	0,01
Praline und Erdbeere	1,9276	0,1937	65,01	1,4914	0,1383	1,68
Chips und Weintrauben	0,6808	0,5663	18,81	-0,2804	0,7796	0,06
Bananen und Schokolade	-2,1494	0,1646	69,79	1,5265	0,1293	1,72
Schnitzel mit Pommes und Salat	-0,5940	0,6127	15,00	0,7103	0,4788	0,39

Bilder	**Fixation Length**					
	Kolmogorov-Smirnov-Test	Mann-Whitney-Test	Kolmogorov-Smirnov-Test	Mann-Whitney-Test	ANOVA	Multiple Range Test
	P-Wert: Adi. - Nicht adi.	P-Wert: Adi. - Nicht adi.	P-Wert: Adi. - Ug.	P-Wert: Adi. - Ug.	P-Wert	
Hamburger und Birne	0,8818	0,3088	0,0329	0,0251	0,2224	normalgew.-untergew.
Praline und Erdbeere	0,0791	0,5012	0,3004	0,3348	0,2857	nicht signifikant
Chips und Weintrauben	0,6415	0,7948	0,5579	0,9240	0,9245	nicht signifikant
Bananen und Schokolade	0,3413	0,6949	0,2882	0,8251	0,6733	nicht signifikant
Schnitzel mit Pommes und Salat	0,5523	0,7879	0,4929	0,9126	0,5296	nicht signifikant

5.2.2.2 Hamburger und Birne

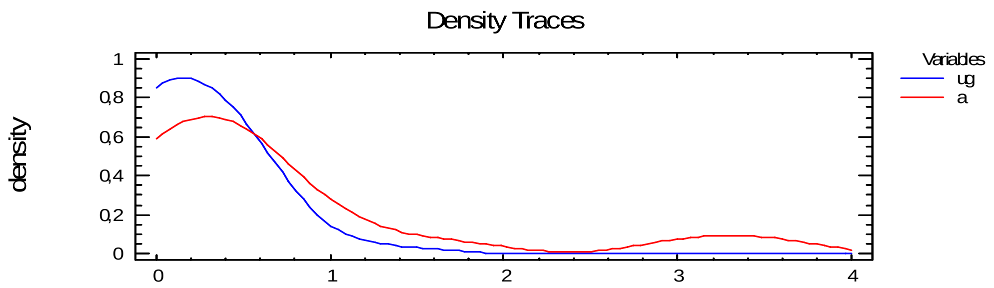

Abbildung 45: Fixation Length - Density trace – Hamburger und Birne - Untergewichtige und Adipöse

Der Prüfwert der regressionsanalytischen Auswertung der Mediane der „Fixation Length“ und des BMIs liegt knapp über dem 90%-Konfidenzniveau, das Bestimmtheitsmaß erklärt einen circa 77-prozentigen Einfluss des BMIs auf die Variabilität der Wahrnehmung. Der Kolmogorov-Smirnov-Test bestätigt, dass es einen signifikanten Unterschied zwischen der Wahrnehmung der adipösen und untergewichtigen Frauen gibt ($\tilde{x}_a$=0,4 [ ], $\tilde{x}_{ug}$=0,1 [ ]). Der P-Wert des Mann-Whitney-Tests beträgt unter 0.05, es kann somit von einem statistisch signifikanten Unterschied zwischen der „Fixation Length“ der Adipösen und der Untergewichtigen ausgegangen werden. Die obige Abbildung stellt diesen Unterschied grafisch dar. Der Multiple-Range-

Test zeigt, dass ein signifikanter Unterschied zwischen den untergewichtigen und normalgewichtigen Frauen vorherrscht.

5.2.2.3 Praline und Erdbeere

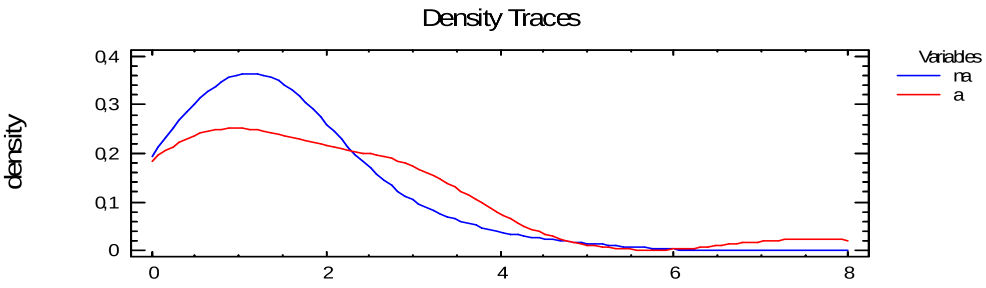

Abbildung 46: Fixation Length - Density trace – Praline und Erdbeere - Nicht Adipöse und Adipöse

Beim Vergleich der „Fixation Length“ der Nicht-Adipösen und Adipösen zeigt sich beim Kolmogorov-Smirnov-Test ein P-Wert von rund 0,08. Unter Voraussetzung des 90%-Konfidenzniveaus besteht hier somit ein statistisch signifikanter Unterschied zwischen den Adipösen und Nicht-Adipösen, den die Abbildung 46 verbildlicht.

5.2.2.4 Chips und Weintrauben

Bei der regressionsanalytischen Betrachtung zeigen sich keine signifikanten Zusammenhänge, auch bei den anderen Tests ergeben sich keine Unterschiede zwischen den Gruppen.

5.2.2.5 Bananen und Schokolade

Beim Bild „Bananen und Schokolade“ zeigen sich keine statistisch signifikanten Zusammenhänge zwischen den Gruppen.

5.2.2.6 Schnitzel mit Pommes und Salat

Die Vergleiche und die regressionsanalytische Auswertung ergeben, dass es keine signifikanten Unterschiede bzw. Zusammenhänge gibt.

5.2.3 Fixation Count

5.2.3.1 Zusammenfassung der Ergebnisse

Tabelle 5: Zusammenfassung - Fixation Count

Bilder	Fixation Count					
	Regressionsanalyse Mediane			Regressionsanalyse Einzelwerte		
	Regressionskoeff.	P-Wert	R² [%]	Regressionskoeff.	P-Wert	R² [%]
Hamburger und Birne	5,6875	0,1174	94,18	0,1937	0,8467	0,03
Praline und Erdbeere	17,5217	0,1102	99,35	0,3468	0,7293	0,09
Chips und Weintrauben	3,0642	0,7675	82,44	1,0991	0,2738	0,93
Bananen und Schokolade	-0,2467	0,3433	2,95	0,3148	0,7534	0,07
Schnitzel mit Pommes und Salat	0,3645	0,2756	6,23	0,7644	0,4460	0,45

Bilder	Fixation Count					
	Kolmogorov-Smirnov-Test	Mann-Whitney-Test	Kolmogorov-Smirnov-Test	Mann-Whitney-Test	ANOVA	Multiple Range Test
	P-Wert: Adi. - Nicht adi.	P-Wert: Adi. - Nicht adi.	P-Wert: Adi. - Ug.	P-Wert: Adi. - Ug.	P-Wert	
Hamburger und Birne	0,6911	0,2111	0,0713	0,0321	0,2187	normalgew.-untergew.
Praline und Erdbeere	0,4920	0,5942	0,1450	0,4582	0,6622	nicht signifikant
Chips und Weintrauben	0,3664	0,3147	0,1064	0,1246	0,6545	nicht signifikant
Bananen und Schokolade	0,9091	0,4593	0,3109	0,4390	0,8212	nicht signifikant
Schnitzel mit Pommes und Salat	0,0988	0,3253	0,4245	0,6343	0,4036	nicht signifikant

5.2.3.2 Hamburger und Birne

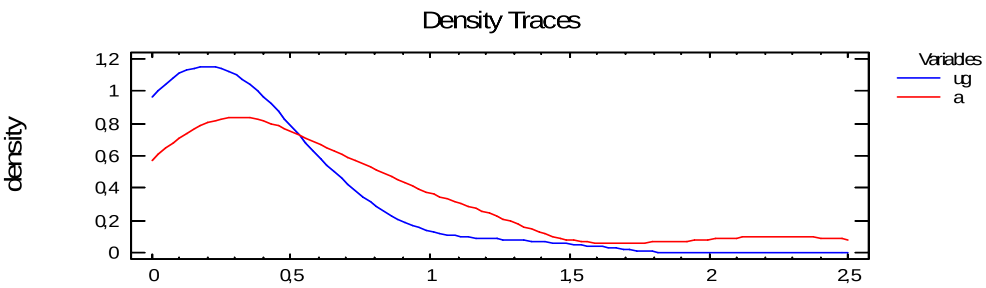

Abbildung 47: Fixation Count - Density trace – Hamburger und Birne - Untergewichtige und Adipöse

Bei der regressionsanalytischen Betrachtung der Mediane der „Fixation Count“ und des BMIs liegt der P-Wert knapp über dem 90%-Konfidenzniveau, das Bestimmtheitsmaß beträgt ca. 94%, somit hätte der BMI einen großen Einfluss auf die Variabilität der Wahrnehmung. Beim Vergleich der Einzelwerte ergibt sich dieser Zusammenhang jedoch nicht.

Der Kolmogorov-Smirnov–Test zeigt, dass der P-Wert der „Fixation Count“ zwischen Adipösen und Untergewichtigen nur knapp über 0,05 liegt. Man kann somit von einem signifikanten Unterschied zwischen der Wahrnehmung von Adipösen und

Untergewichtigen ausgehen, den die Abbildung 47 verdeutlicht. Weiters zeigt sich ein signifikanter Unterschied zwischen den Untergewichtigen und den Normalgewichtigen.

5.2.3.3 Praline und Erdbeere

Der Prüfwert der Regressionsanalyse der Mediane der „Fixation Count“ und des BMIs ist knapp über dem 90%-Konfidenzniveau, das Bestimmtheitsmaß ist fast 100%. Es zeigen sich aber keine signifikanten Zusammenhänge bzw. Unterschiede bei der regressionsanalytischen Auswertung der Einzelwerte bzw. bei den Vergleichen zwischen den einzelnen Gruppen.

5.2.3.4 Chips und Weintrauben

Der Kolmogorov-Smirnov-Test und Mann-Whitney-Test der „Fixation Count“ der Adipösen und der Untergewichtigen ergeben P-Werte von knapp über 0.1, die Regressionsanalyse zeigt keine statistisch signifikanten Zusammenhänge.

5.2.3.5 Bananen und Schokolade

Es bestehen keine signifikanten Unterschiede und Zusammenhänge zwischen den Gruppen.

5.2.3.6 Schnitzel mit Pommes und Salat

Der P-Wert des Komogorov-Smirnov-Tests beträgt knapp unter 0,1. Somit kann unter Annahme eines 90%-Konfidenzniveaus ein statistisch signifikanter Unterschied zwischen der „Fixation Count“ der Adipösen und der Nicht-Adipösen angenommen werden.

5.2.4 Observation Length

5.2.4.1 Zusammenfassung der Ergebnisse

Tabelle 6: Zusammenfassung - Observation Length

Bilder	Observation Length					
	Regressionsanalyse Mediane			Regressionsanalyse Einzelwerte		
	Regressionskoeff.	P-Wert	R² [%]	Regressionskoeff.	P-Wert	R² [%]
Hamburger und Birne	2,6544	0,1174	77,89	0,2043	0,8385	0,03
Praline und Erdbeere	2,7567	0,1102	79,17	0,6431	0,5213	0,32
Chips und Weintrauben	-0,3381	0,7675	5,41	-0,4873	0,6269	0,19
Bananen und Schokolade	-1,2315	0,3433	43,13	1,5518	0,1231	1,78
Schnitzel mit Pommes und Salat	1,4859	0,2756	52,47	1,4108	0,1607	1,52

Bilder	Observation Length					
	Kolmogorov-Smirnov-Test	Mann-Whitney-Test	Kolmogorov-Smirnov-Test	Mann-Whitney-Test	ANOVA	Multiple Range Test
	P-Wert: Adi. - Nicht adi.	P-Wert: Adi. - Nicht adi.	P-Wert: Adi. - Ug.	P-Wert: Adi. - Ug.	P-Wert	
Hamburger und Birne	0,3100	0,3348	0,0316	0,0461	0,2710	nicht signifikant
Praline und Erdbeere	0,2148	0,2622	0,2276	0,2639	0,3772	nicht signifikant
Chips und Weintrauben	0,6403	0,8442	0,7811	0,7754	0,6362	nicht signifikant
Bananen und Schokolade	0,3376	0,4274	0,5540	0,3829	0,5661	nicht signifikant
Schnitzel mit Pommes und Salat	0,3823	0,5074	0,4929	0,4870	0,3393	nicht signifikant

5.2.4.2 Hamburger und Birne

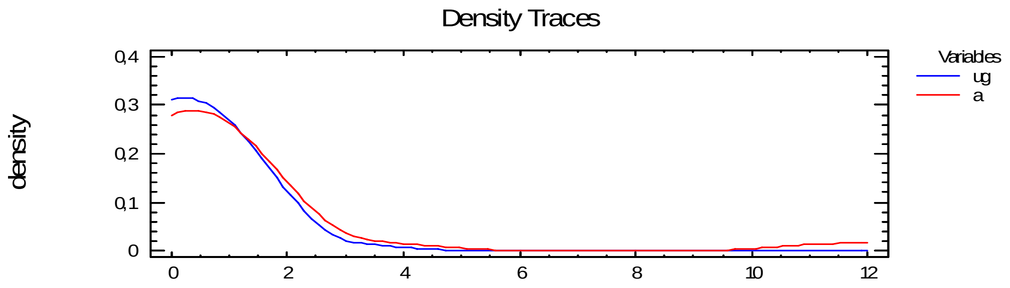

Abbildung 48: Observation Length - Density trace – Hamburger und Birne - Untergewichtige und Adipöse

Es besteht kein signifikanter Zusammenhang zwischen den Medianen der „Observation Length" und des BMIs. Erwähnenswert ist, dass sich der P-Wert knapp außerhalb des 90%-Konfidenzniveaus befindet. Beim paarweisen Vergleich der Adipösen und Untergewichtigen bzw. beim Kolmogorov-Smirnov-Test zeigt sich ein signifikanter Unterschied ($\tilde{x}_{a}$=0,3 [ ], $\tilde{x}_{ug}$=0,1 [ ]). Die Abbildung 48 stellt diesen Unterschied grafisch dar.

5.2.4.3 Praline und Erdbeere

Auch bei dieser Regressionsanalyse der Mediane der „Observation Length“ und des BMIs befindet sich der Prüfwert knapp außerhalb des 90%-Konfidenzniveaus. Zwischen den Gruppen zeigen sich keine signifikanten Unterschiede.

5.2.4.4 Chips und Weintrauben

Das x-reziproke Modell beschreibt den Zusammenhang zwischen BMI und der Wahrnehmung von fettreichen und –armen Speisen am besten. Es gibt keine signifikanten Unterschiede zwischen den Gruppen.

5.2.4.5 Bananen und Schokolade

Auch bei diesem Bild beschreibt das x-reziproke Modell den Zusammenhang am besten. Weiters zeigen sich keine signifikanten Unterschiede zwischen den Gruppen.

5.2.4.6 Schnitzel mit Pommes und Salat

Das doppeltreziproke bzw. x-reziproke Modell stellen den Zusammenhang zwischen den Merkmalen besser als das lineare Modell dar. Es zeigen sich keine statistisch signifikanten Unterschiede zwischen den Gruppen.

5.2.5 Observation Count

5.2.5.1 Zusammenfassung der Ergebnisse

Tabelle 7: Zusammenfassung - Observation Count

Bilder	Observation Count					
	Regressionsanalyse Mediane			Regressionsanalyse Einzelwerte		
	Regressionskoeff.	P-Wert	R^2 [%]	Regressionskoeff.	P-Wert	R^2 [%]
Hamburger und Birne	1,3738	0,3032	48,55	-0,6995	0,4855	0,38
Praline und Erdbeere	-0,6830	0,5651	18,91	-0,9727	0,3325	0,72
Chips und Weintrauben	0,3365	0,7686	5,36	0,2854	0,7758	0,06
Bananen und Schokolade	0,1468	0,8967	1,07	1,1370	0,2576	0,96
Schnitzel mit Pommes und Salat	2,4915	0,0988	81,22	2,1396	0,0343	3,43

Bilder	Observation Count					
	Kolmogorov-Smirnov-Test	Mann-Whitney-Test	Kolmogorov-Smirnov-Test	Mann-Whitney-Test	ANOVA	Multiple Range Test
	P-Wert: Adi. - Nicht adi.	P-Wert: Adi. - Nicht adi.	P-Wert: Adi. - Ug.	P-Wert: Adi. - Ug.	P-Wert	
Hamburger und Birne	0,4922	0,9594	0,2630	0,1995	0,2085	normalgew.-untergew.
Praline und Erdbeere	0,4960	0,5899	0,0669	0,8373	0,6746	nicht signifikant
Chips und Weintrauben	0,5949	0,6351	0,0140	0,8519	0,6637	nicht signifikant
Bananen und Schokolade	0,3127	0,2044	0,0008	0,3994	0,4215	nicht signifikant
Schnitzel mit Pommes und Salat	0,0211	0,3534	0,2251	engerl	0,0681	normalgew.-adipös

5.2.5.2 Hamburger und Birne

Es besteht kein signifikanter Unterschied bei der regressionsanalytischen Betrachtung der Mediane der „Observation Count“ und des BMIs bzw. bei der regressionsanalytischen Auswertung der Einzelwerten. Das x-reziproke Modell wäre in diesem Fall dem linearen Modell vorzuziehen. Es herrscht kein signifikanter Unterschied zwischen den Gruppen vor, mit Ausnahme der untergewichtigen Frauen im Vergleich zu der Gruppe der normalgewichtigen Probandinnen.

5.2.5.3 Praline und Erdbeere

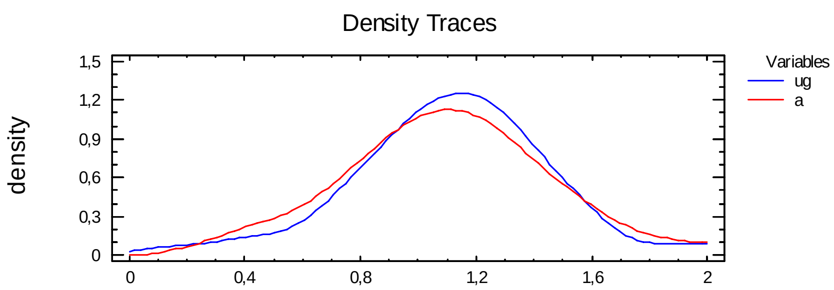

Abbildung 49: Observation Count- Density trace – Praline und Erdbeere - Untergewichtige und Adipöse

Der P-Wert des Kolmogorov-Smirnov-Tests der Adipösen und Untergewichtigen zeigt im Konfidenzniveau von 90% einen statistisch signifikanten Unterschied. Grafisch ist dieser Unterschied in Abbildung 49 ersichtlich.

5.2.5.4 Chips und Weintrauben

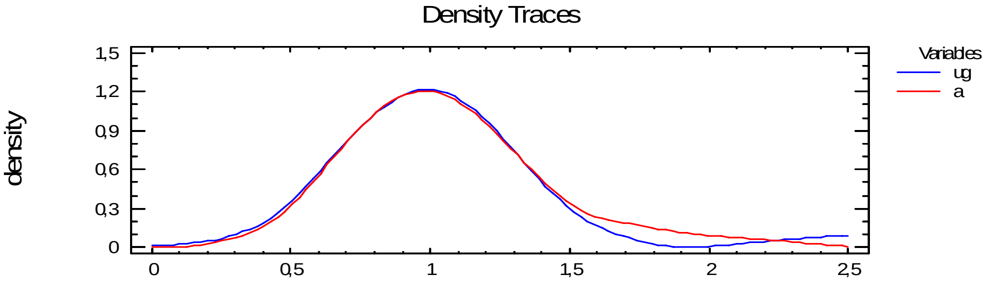

Abbildung 50: Observation Count- Density trace – Chips und Weintrauben - Untergewichtige und Adipöse

Es zeigt sich kein signifikanter Zusammenhang bei der regressionsanalytischen Auswertung der Mediane der „Observation Count“ und des BMIs bzw. bei der Auswertung der Einzelwerte, doch es zeigt sich ein signifikanter Unterschied in der Verteilung der Wahrnehmung der adipösen und der untergewichtigen Frauen ($\tilde{x}_a$=1,0 [ ] , $\tilde{x}_{ug}$=1,0 [ ]). Der P-Wert des Kolmogorov-Smirnov-Tests beträgt circa 0,01.

5.2.5.5 Bananen und Schokolade

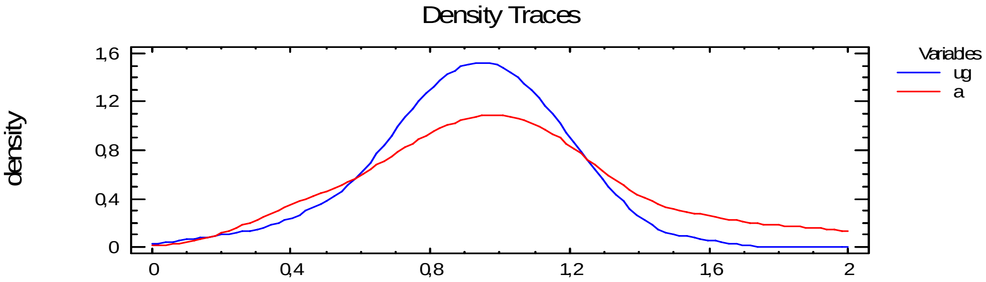

Abbildung 51: Observation Count- Density trace – Bananen und Schokolade - Untergewichtige und Adipöse

Der Prüfwert des Kolmogorov-Smirnov-Tests beträgt unter 0.05, es besteht somit ein statistisch signifikanter Unterschied zwischen der „Observation Count" der Gruppe der adipösen und der der untergewichtigen Frauen ($\tilde{x}_{a}$=1,0 [ ], $\tilde{x}_{ug}$=1,0 [ ]).

5.2.5.6 Schnitzel mit Pommes und Salat

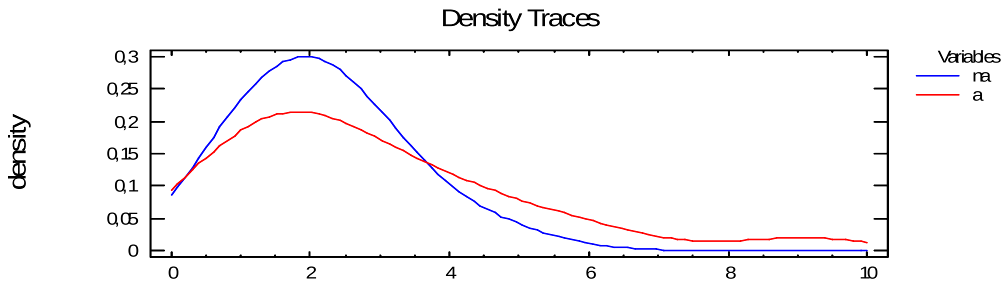

Abbildung 52: Observation Count- Density trace – Schnitzel mit Pommes und Salat – Nicht Adipöse und Adipöse

Die Regressionsanalyse lässt auf einen signifikanten Zusammenhang zwischen den Einzelwerten der „Observation Count" und des BMIs im Konfidenzniveau von 95% und zwischen den Medianen der zwei Merkmale im Konfidenzniveau von 90% schließen. Das Bestimmtheitsmaß erklärt einen linearen Zusammenhang zwischen den Medianen der „Observation Count" und des BMIs von ca. 81% und zwischen den Einzelwerten von ca. 3%. Weiters besteht ein signifikanter Unterschiede zwischen der Gruppe der Normalgewichtigen und der Adipösen bzw. zeigt der Komogorov-Smirnov-Test einen signifikanten Unterschied zwischen der adipösen und nicht adipösen Versuchspersonen ($\tilde{x}_{a}$=2,3 [ ], $\tilde{x}_{na}$=2,0 [ ]), der in Abbildung 52 grafisch dargestellt ist.

5.3 Hauptkomponentendarstellung

5.3.1 First Fixation

5.3.1.1 Hamburger und Birne

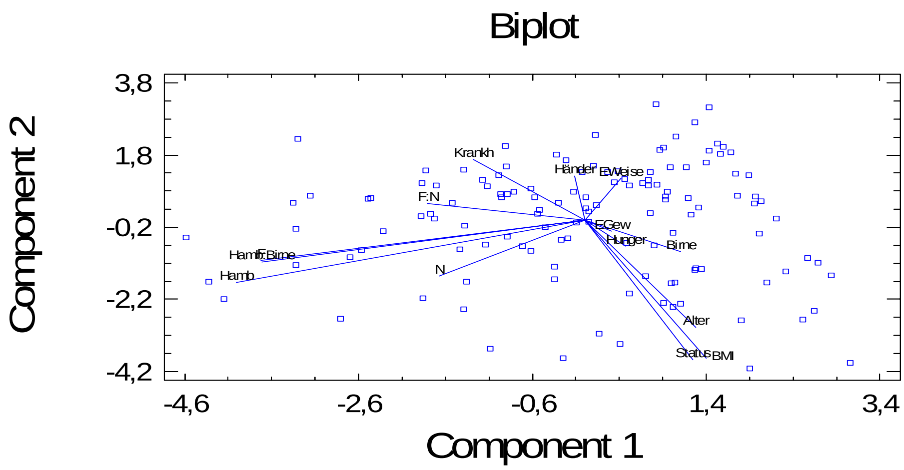

Abbildung 53: HKA - First Fixation - Hamburger und Birne

Bei der Darstellung der Hauptkomponentenanalyse ist ein Zusammenhang zwischen BMI und Alter zu sehen. Außerdem zeigen sich Abhängigkeiten zwischen Rechts- bzw. Linkshänder und der Ernährungsweise bzw. der Ernährungsgewohnheit und dem Hunger.

5.3.1.2 Praline und Erdbeere

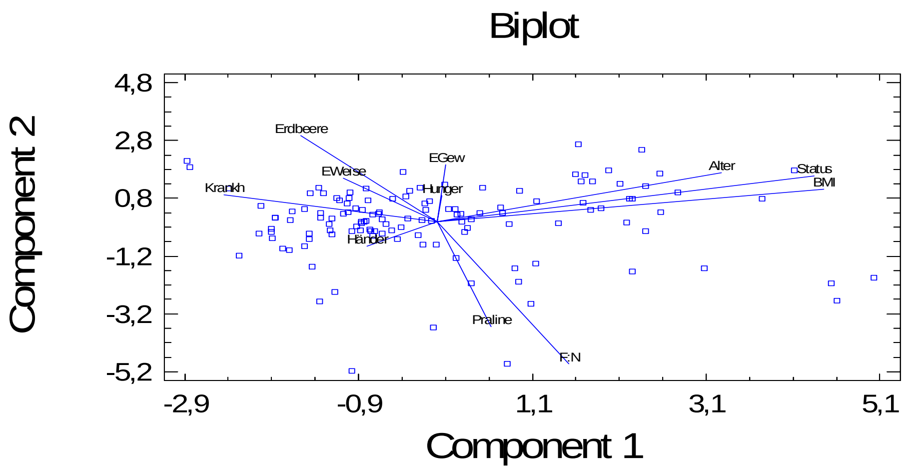

Abbildung 54: HKA - First Fixation – Praline und Erdbeere

Die Hauptkomponentenanalyse zeigt eine Abhängigkeit zwischen BMI und Alter bzw. zwischen der Ernährungsgewohnheit und dem Hunger.

5.3.1.3 Chips und Weintrauben

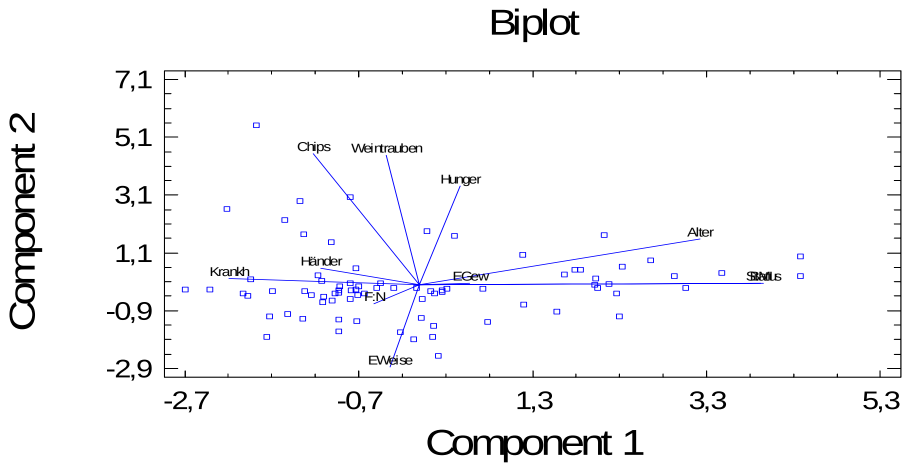

Abbildung 55: HKA - First Fixation – Chips und Weintrauben

Die Hauptkomponentenanalyse beschreibt einen Zusammenhang zwischen BMI und Alter bzw. zwischen Ernährungsgewohnheit und Alter.

5.3.1.4 Bananen und Schokolade

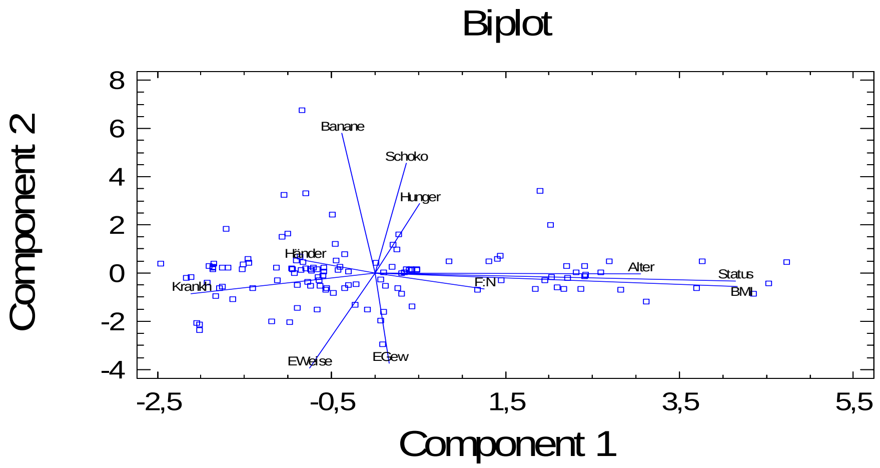

Abbildung 56: HKA - First Fixation – Bananen und Schokolade

Es gibt Zusammenhänge zwischen drei Merkmalen, nämlich zwischen Fett-Nichtfett-Verhältnis, Alter und BMI.

5.3.1.5 Schnitzel mit Pommes und Salat

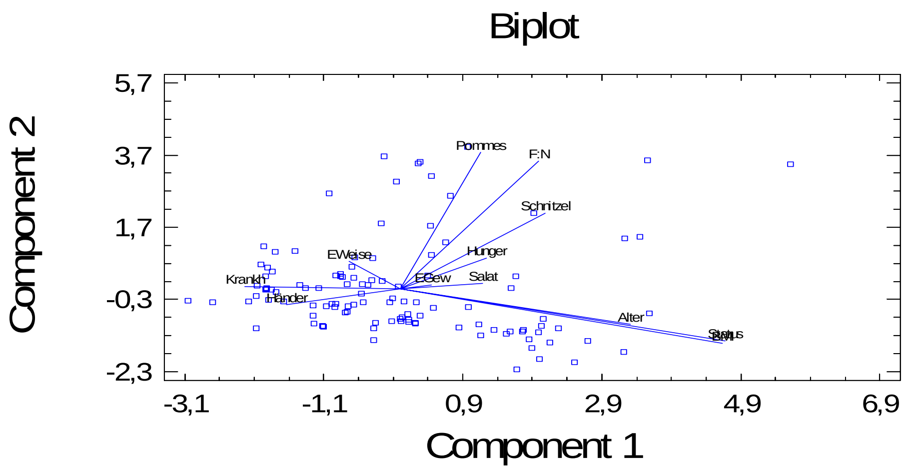

Abbildung 57: HKA - First Fixation – Schnitzel mit Pommes und Salat

Es gibt Zusammenhänge zwischen Alter und BMI bzw. zwischen Ernährungsgewohnheit und Hunger.

5.3.2 Fixation Length

5.3.2.1 Hamburger und Birne

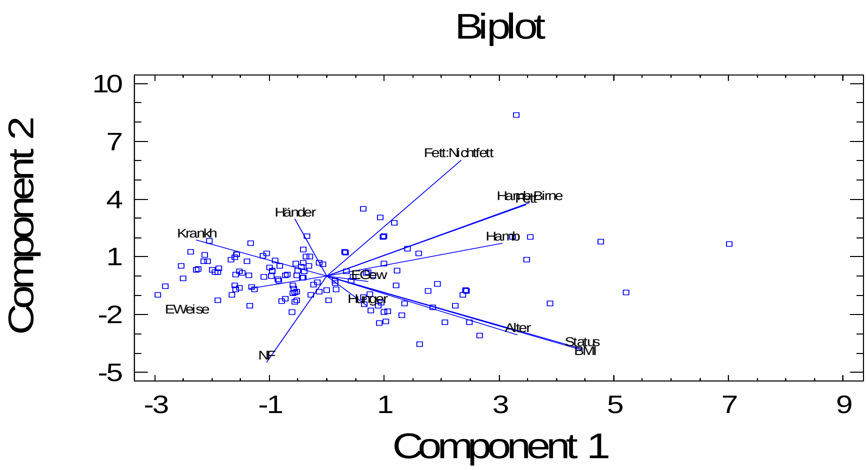

Abbildung 58: HKA – Fixation Length- Hamburger und Birne

Die Hauptkomponentenanalyse beschreibt einen Zusammenhang zwischen BMI und Alter bzw. zwischen Ernährungsgewohnheit und Hunger.

5.3.2.2 Praline und Erdbeere

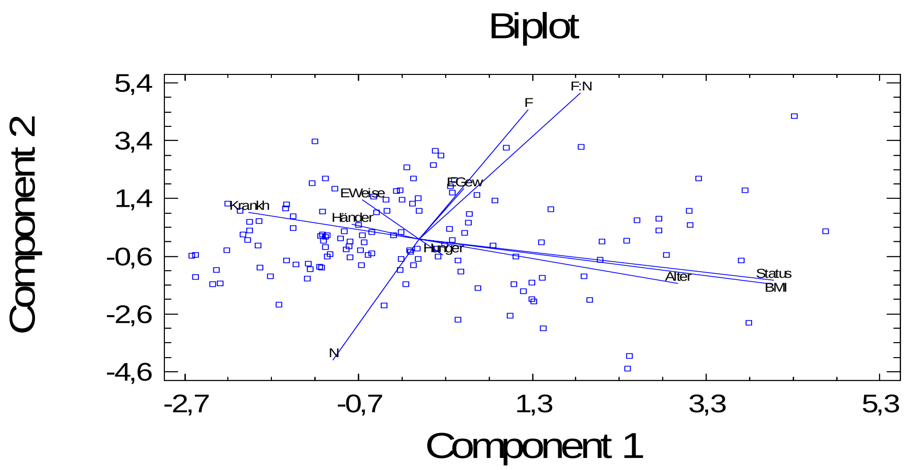

Abbildung 59: HKA – Fixation Length- Praline und Erdbeere

Die Hauptkomponentenanalyse zeigt, dass die Ernährungsweise und Rechts- bzw. Linkshänder bzw. Alter und BMI zusammenhängen.

5.3.2.3 Chips und Weintrauben

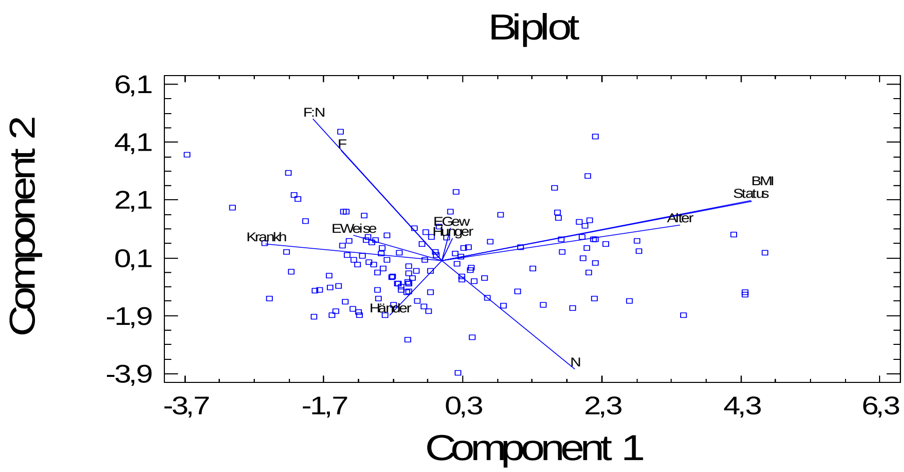

Abbildung 60: HKA – Fixation Length- Chips und Weintrauben

Die Hauptkomponentenanalyse beschreibt einen Zusammenhang zwischen BMI und Alter, Ernährungsgewohnheit und Hunger bzw. Ernährungsweise und Krankheit.

5.3.2.4 Bananen und Schokolade

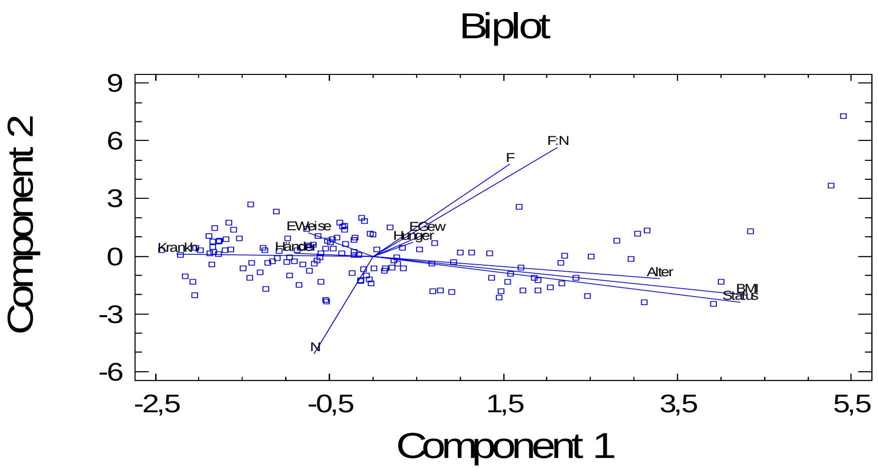

Abbildung 61: HKA – Fixation Length- Bananen und Schokolade

Die Hauptkomponentenanalyse beschreibt einen Zusammenhang zwischen BMI und Alter, Ernährungsgewohnheit und Hunger bzw. Rechts- bzw. Linkshänder und das Auftreten von Krankheiten.

5.3.2.5 Schnitzel mit Pommes und Salat

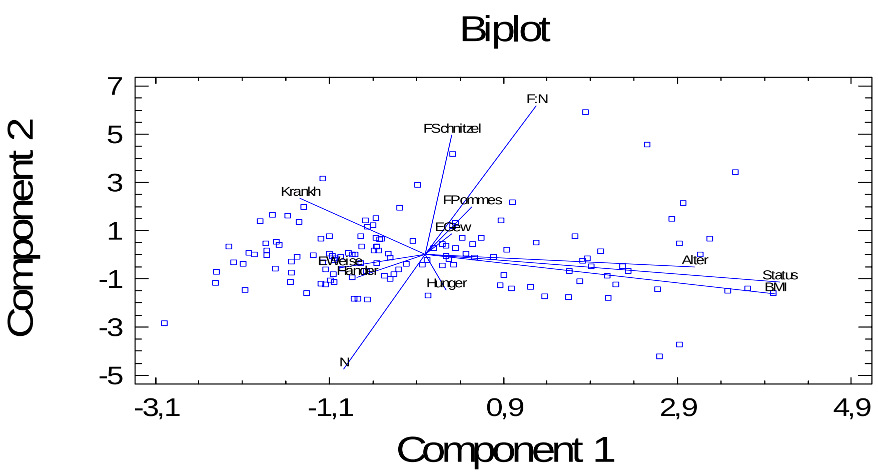

Abbildung 62: HKA – Fixation Length- Schnitzel mit Pommes und Salat

Die Hauptkomponentenanalyse beschreibt einen Zusammenhang zwischen BMI und Alter bzw. Ernährungsweise und Rechts- bzw. Linkshänder.

5.3.3 Fixation Count

5.3.3.1 Hamburger und Birne

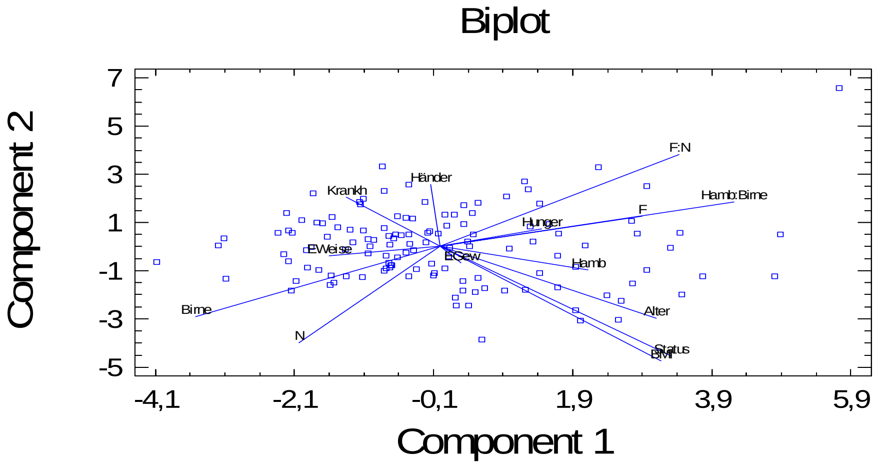

Abbildung 63: HKA – Fixation Count - Hamburger und Birne

Es gibt Zusammenhänge zwischen Alter und BMI bzw. zwischen Hunger und der Wahrnehmung fettreicher Lebensmittel.

5.3.3.2 Praline und Erdbeere

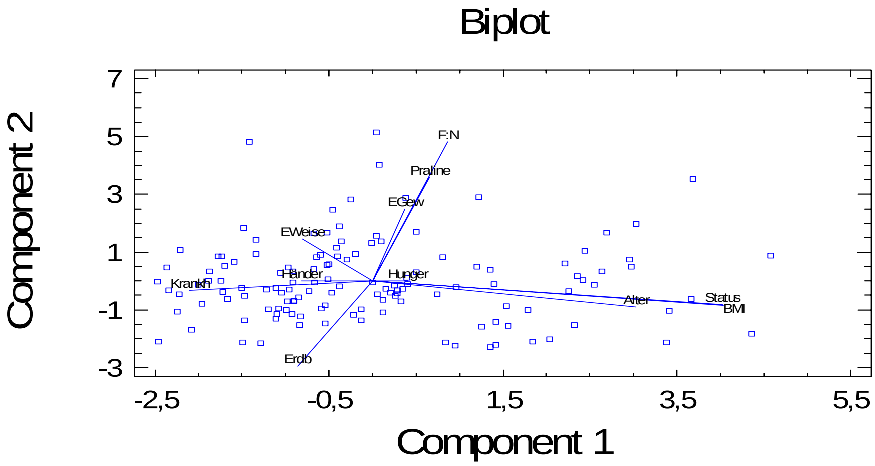

Abbildung 64: HKA – Fixation Count – Praline und Erdbeere

Die Hauptkomponentenanalyse beschreibt einen Zusammenhang zwischen BMI und Alter, Krankheit und Rechts- bzw. Linkshänder bzw. Wahrnehmung fettreicher Speisen und der Ernährungsgewohnheit.

5.3.3.3 Chips und Weintrauben

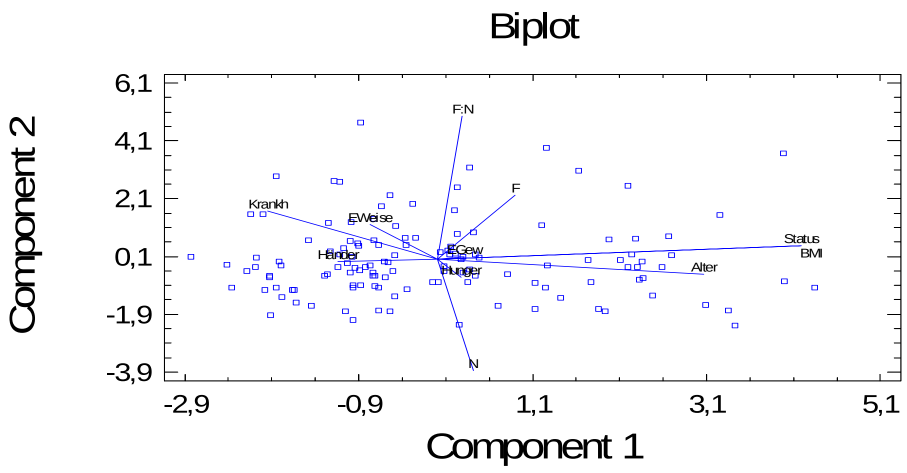

Abbildung 65: HKA – Fixation Count – Chips und Weintrauben

Es zeigt sich ein Zusammenhang zwischen Krankheit, Ernährungsweise und Links- bzw. Rechtshänder.

5.3.3.4 Bananen und Schokolade

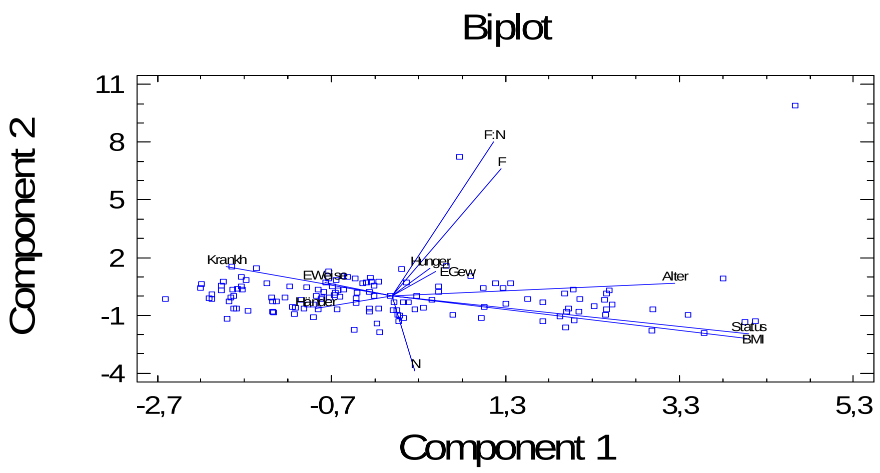

Abbildung 66: HKA – Fixation Count – Bananen und Schokolade

Die Hauptkomponentenanalyse beschreibt einen Zusammenhang zwischen Hunger, Ernährungsgewohnheit und der Wahrnehmung von fettreichen Speisen.

5.3.3.5 Schnitzel mit Pommes und Salat

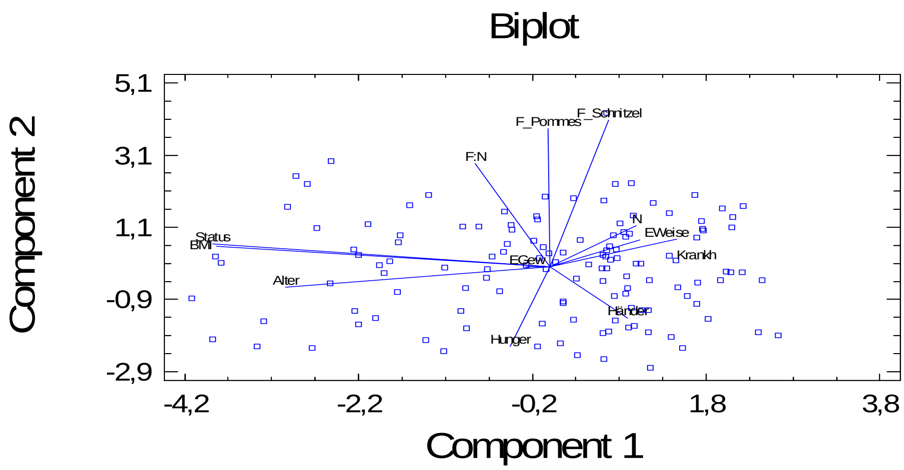

Abbildung 67: HKA – Fixation Count – Schnitzel mit Pommes und Salat

Die Ernährungsweise korreliert mit der Wahrnehmung von fettarmen Speisen bzw. mit dem Auftreten von Krankheiten.

5.3.4 Observation Length

5.3.4.1 Hamburger und Birne

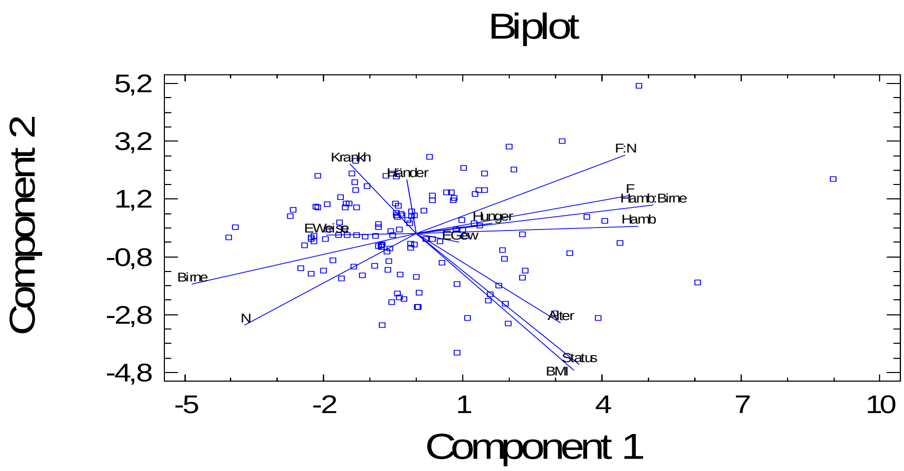

Abbildung 68: HKA – Observation Length - Hamburger und Birne

Die Hauptkomponentenanalyse beschreibt einen Zusammenhang zwischen Hunger, Ernährungsgewohnheit und der Wahrnehmung von fettreichen Speisen, außerdem zwischen Alter und BMI.

5.3.4.2 Praline und Erdbeere

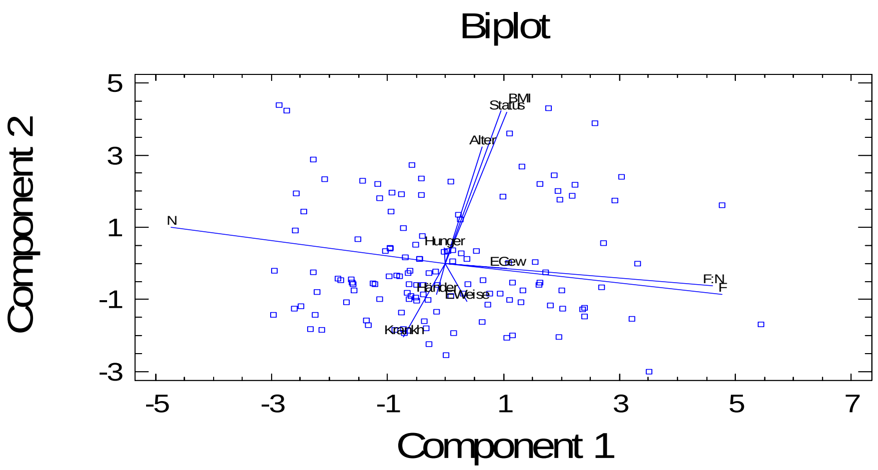

Abbildung 69: HKA – Observation Length – Praline und Erdbeere

Es gibt Zusammenhänge zwischen Rechts- bzw. Linkshänder und Krankheit und zwischen Hunger, Alter und BMI.

5.3.4.3 Chips und Weintrauben

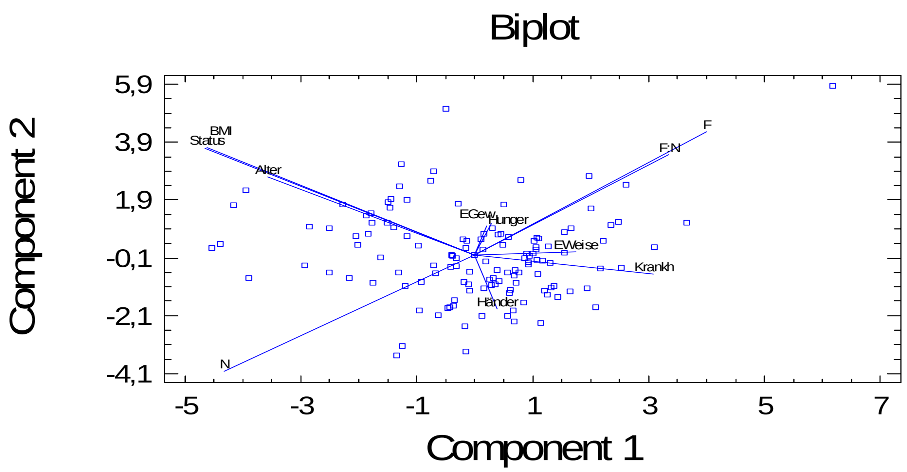

Abbildung 70: HKA – Observation Length – Chips und Weintrauben

Es gibt Zusammenhänge zwischen Alter und BMI bzw. zwischen Ernährungsgewohnheit und Hunger.

5.3.4.4 Bananen und Schokolade

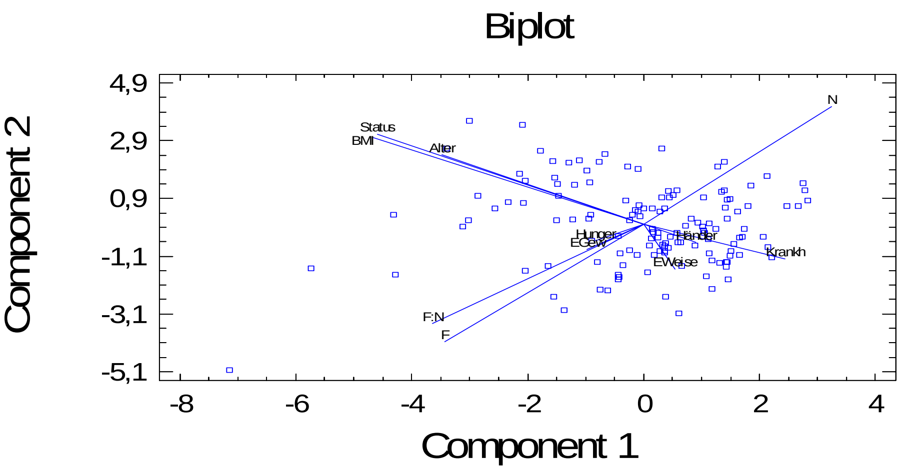

Abbildung 71: HKA – Observation Length – Bananen und Schokolade

Es zeigen sich Zusammenhänge zwischen Rechts- bzw. Linkshänder und dem Auftreten von Krankheiten bzw. zwischen Hunger und Ernährungsgewohnheit.

5.3.4.5 Schnitzel mit Pommes und Salat

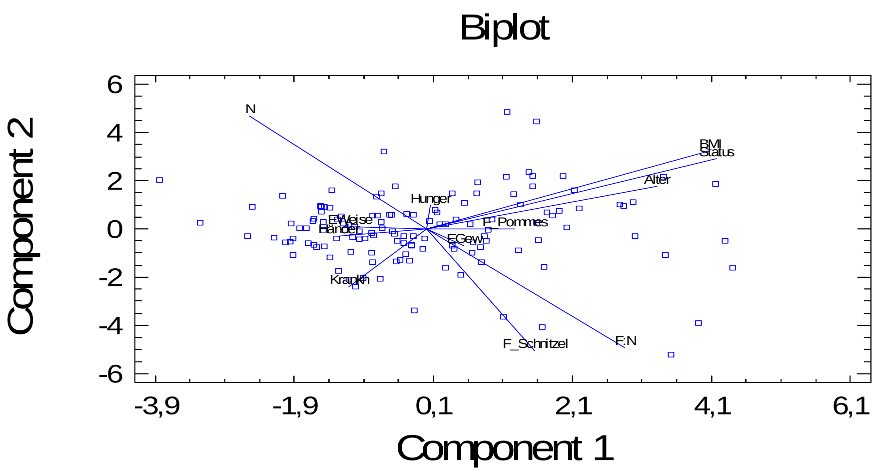

Abbildung 72: HKA – Observation Length – Schnitzel mit Pommes und Salat

Es gibt Zusammenhänge zwischen BMI und Alter bzw. zwischen Ernährungsweise und Rechts- bzw. Linkshänder.

5.3.5 Observation Count

5.3.5.1 Hamburger und Birne

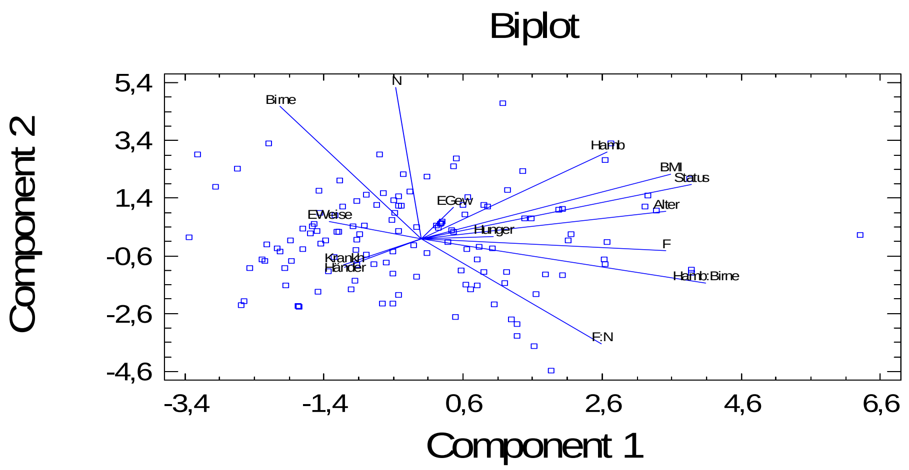

Abbildung 73: HKA – Observation Count - Hamburger und Birne

Laut Hauptkomponentenanalyse gibt es Zusammenhänge zwischen Links- bzw. Rechtshänder und dem Auftreten von Krankheiten.

5.3.5.2 Praline und Erdbeere

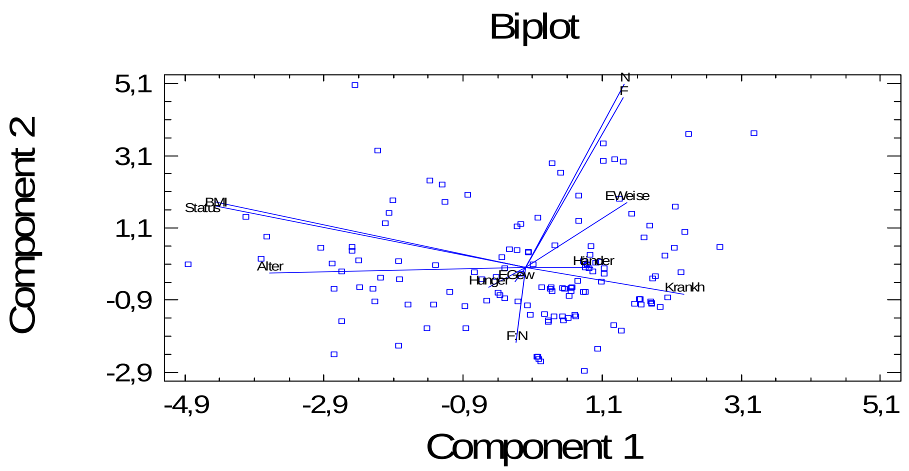

Abbildung 74: HKA – Observation Count – Praline und Erdbeere

Es zeigen sich Zusammenhänge zwischen Hunger und der Ernährungsgewohnheit.

5.3.5.3 Chips und Weintrauben

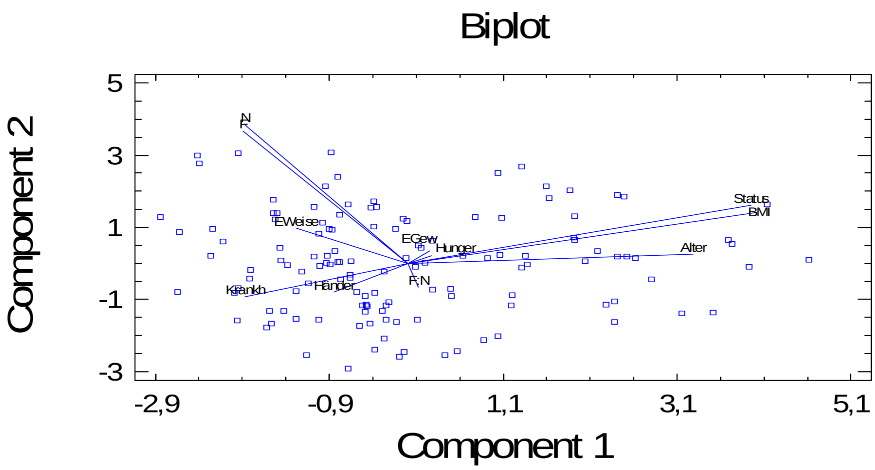

Abbildung 75: HKA – Observation Count – Chips und Weintrauben

Es zeigen sich Zusammenhänge zwischen Hunger und Ernährungsgewohnheit und zwischen dem Auftreten von Krankheiten und Rechts- bzw. Linkshänder.

5.3.5.4 Bananen und Schokolade

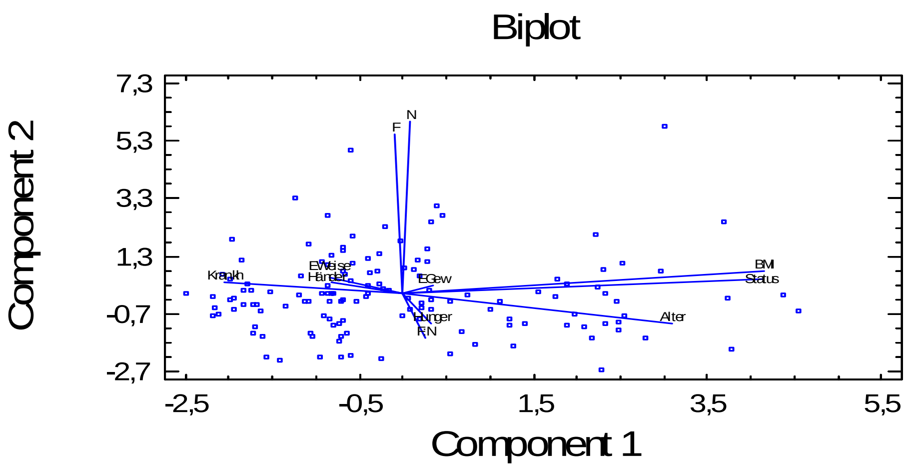

Abbildung 76: HKA – Observation Count – Bananen und SChokolade

Es gibt Zusammenhänge zwischen der Wahrnehmung von fettreichen bzw. -armen Speisen und Hunger bzw. zwischen Krankheit, Ernährungsweise und Rechts- bzw. Linkshänder.

5.3.5.5 Schnitzel mit Pommes und Salat

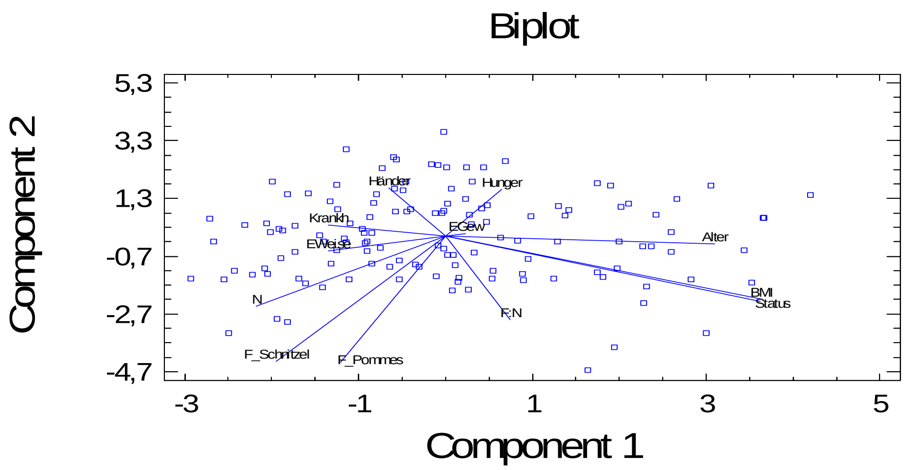

Abbildung 77: HKA – Observation Count – Schnitzel mit Pommes und Salat

Es zeigt sich ein Zusammenhang zwischen Ernährungsgewohnheit und Hunger.

5.3.6 Fixation Before

5.3.6.1 Hamburger und Birne

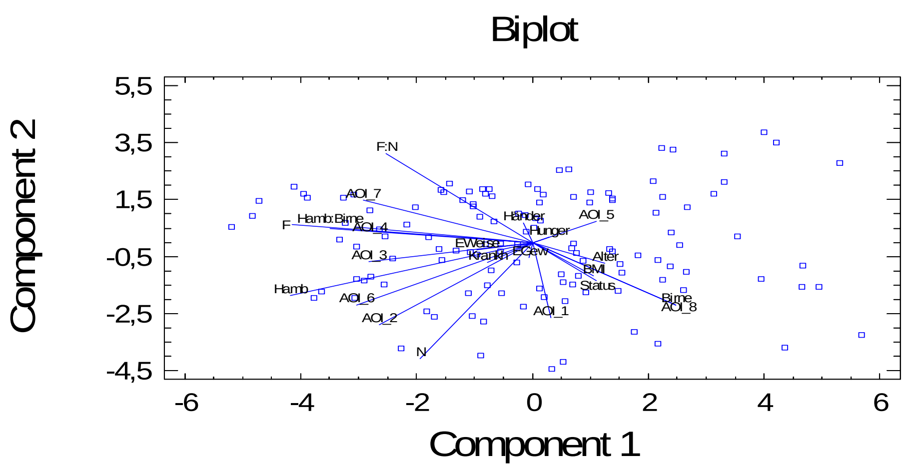

Abbildung 78: HKA – Fixation Before - Hamburger und Birne

Es zeigen sich Zusammenhänge zwischen Rechts- bzw. Linkshänder und Hunger bzw. zwischen BMI, Wahrnehmung von fettarmen Speisen und dem Alter.

5.3.6.2 Praline und Erdbeere

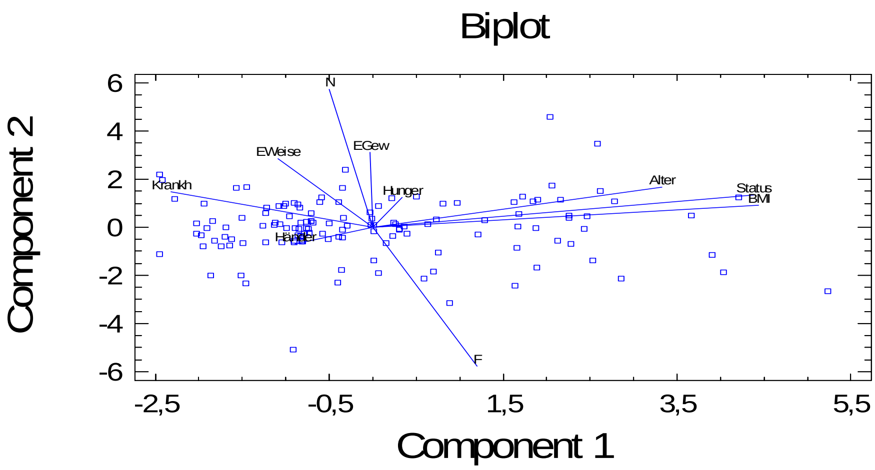

Abbildung 79: HKA – Fixation Before – Praline und Erdbeere

Laut Hauptkomponentenanalyse gibt es Zusammenhänge zwischen BMI und Alter.

5.3.6.3 Chips und Weintrauben

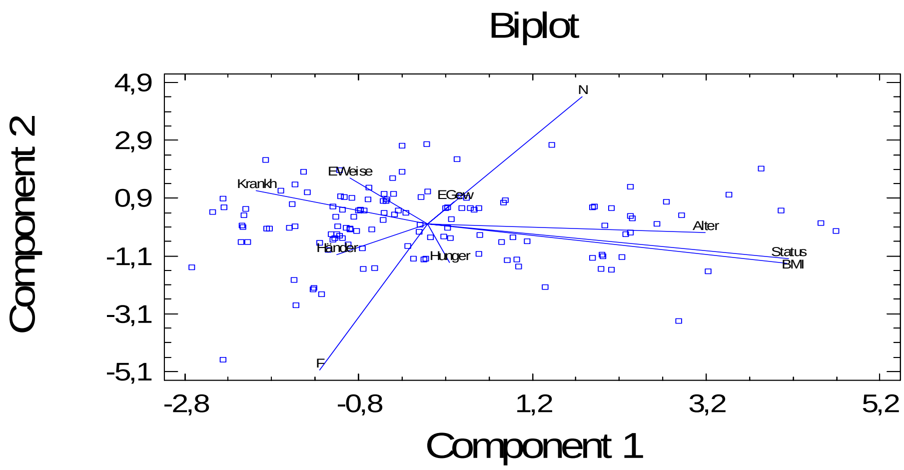

Abbildung 80: HKA – Fixation Before – Chips und Weintrauben

Die Hauptkomponentenanalyse zeigt Zusammenhänge zwischen der Ernährungsgewohnheit und der Wahrnehmung von fettarmen Speisen.

5.3.6.4 Bananen und Schokolade

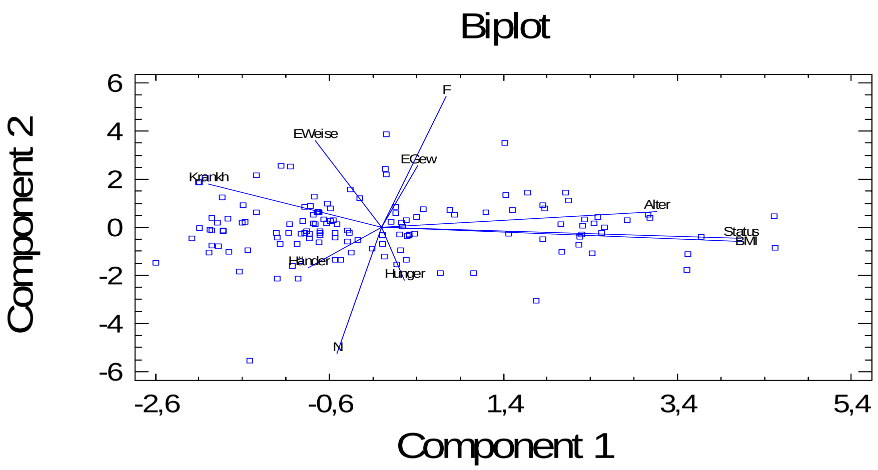

Abbildung 81: HKA – Fixation Before – Bananen und Schokolade

Es besteht ein Zusammenhang zwischen Ernährungsgewohnheit und der Wahrnehmung von fettreichen Speisen.

5.3.6.5 Schnitzel mit Pommes und Salat

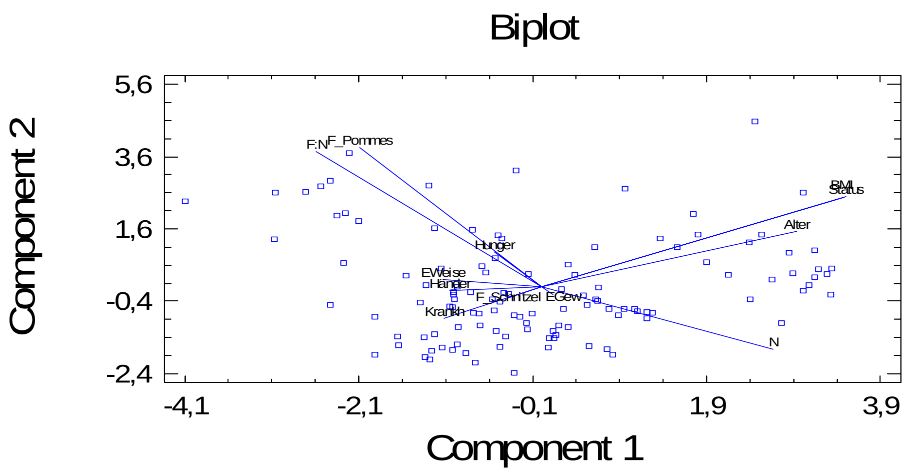

Abbildung 82: HKA – Fixation Before – Schnitzel mit Pommes und Salat

Laut Hauptkomponentenanalyse gibt es Zusammenhänge zwischen Ernährungsweise und Links- bzw. Rechtshänder bzw. zwischen Wahrnehmung von fettreichen Lebensmitteln und Krankheit.

5.4 Allgemeines

Grundsätzlich fällt bei den Diagrammen und Daten auf, dass es sich nicht um typische lineare Zusammenhänge mit einigen, wenigen Ausreißern handelt. Es gibt Werte, die sehr stark von den anderen Werten abweichen, aber nicht eliminiert wurden, weil die jeweiligen Probandinnen die Situation auf diese Weise wahrgenommen haben und es sich somit nicht um Ausreißer handelt.

Beim Vergleich mit alternativen Modellen fällt auch auf, dass sich das lineare Modell am besten zur Auswertung eignet.

5.5 Spezielles

5.5.1 Auffälliges

Alle 4 Gruppen schauen beim ersten Bild zuerst auf den Tomate-Zwiebelringe-Bereich, die Untergewichtigen, Übergewichtigen und Adipösen schauen zuletzt auf die untere Brotscheibe, die Normalgewichtigen zuletzt auf den Salat. Adipöse schauen im Vergleich zu den Untergewichtigen länger auf den Hamburger als auf die Birne. Nur wenige Übergewichtige schauen auf den unteren Brotdeckel.

Beim zweiten Bild wird in allen 4 Gruppen zuerst auf die Praline geschaut, und dann erst auf die Erdbeere.

Viele Frauen schauen beim dritten Bild sofort auf die Weintraube. Das liegt zum Teil daran, dass sich das Kreuz des Zwischenbildes sich teilweise mit den Areas of Interests, v.a. mit AOI_2 (also den Weintrauben) deckt. Daher ist die Time to First Fixation oft Null.

Beim letzten Bild schauen die Frauen zuerst auf das Schnitzel, dann auf den Salat und zuletzt auf die Pommes.

Bei allen fünf Bildern schauen hungrige Frauen schneller auf die Lebensmitteln als satte Frauen, die Time to first Fixation ist bei hungrigen Frauen kürzer als bei satten Frauen. Weiters betrachten ältere Damen die Lebensmittel öfters: Der Fixation Count von Frauen über 50 Jahre ist bei vier von fünf Bildern (Praline und Erdbeere, Hamburger und Birne, Weintrauben und Birne, Schokolade und Bananen) höher als bei jüngeren Frauen (unter 50 Jahre).

Alle getesteten Frauen, die nicht alles essen (Vegetarier etc.), sind unter 26, haben keine Schilddrüsen-Probleme bzw. leiden nicht unter Zuckerkrankheit und sind Rechtshänder. Keine davon ist adipös.

Korreliert man bestimmte AOIs mit dem BMI, zeigt sich öfters ein trichterförmiger Zusammenhang zwischen den zwei untersuchten Merkmalen. Die folgende Abbildung zeigt den Einfluss des BMIs auf die Wahrnehmung von Chips.

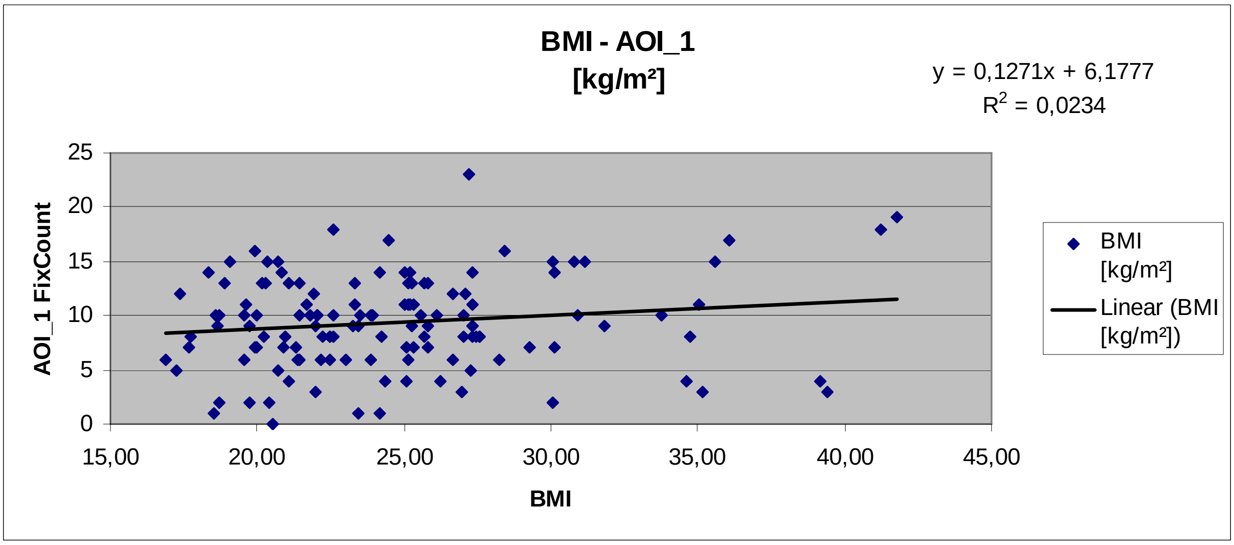

Abbildung 83: Diagramm – Fixation Count - AOI vs. BMI

Es zeigt sich, dass sich die Punkte bei höherem BMI in zwei Gruppen aufspalten.

Laut Hauptkomponentenanalyse zeigen sich öfters Zusammenhänge zwischen dem Auftreten von Rechts- bzw. Linkshänder und der Ernährungsweise bzw. Krankheit und zwischen dem Vorhandensein von Hunger und der Ernährungsgewohnheit.

Bei den Vergleichen zeigen sich statistisch signifikante Unterschiede vor allem zwischen Hamburger und Birne, Chips und Weintrauben und Schnitzel mit Pommes und Salat. Das könnte daran liegen, dass es sich bei den beschriebenen, kalorienreichen Speisen um pikante, also nicht süße, Lebensmittel handelt. Ein weiterer Grund dafür ist, dass es sich um komplexe Lebensmittel handelt. Beim Hamburger gibt es mehrere Schichten, es ist mehr zu sehen, als z. B. bei der Schokolade oder bei der Praline. Komplexere Mahlzeiten geben somit vielleicht mehr Aufschluss über die Wahrnehmung der Versuchspersonen als die gewählte minimalistische Darstellung der Speisen.

Obwohl der Vergleich nicht immer eindeutig ist, zeigt sich sehr oft eine Tendenz dahinführend, dass es einen Zusammenhang zwischen dem BMI und dem Blickverhalten gibt.

5.5.2 Alter und BMI

Es zeigt sich ein deutlich signifikanter Zusammenhang zwischen dem BMI und dem Alter. Je älter die Frauen sind, desto höher ist der BMI. Der Kolmogorov-Smirnov-Test besagt, dass sich die Werte signifikant voneinander unterscheiden.

5.5.3 Einflussfaktoren

Es gibt viele Faktoren, die einen Einfluss auf die sechs Parameter der Testergebnisse haben.

Zum Beispiel spielt die räumliche Anordnung der Objekte eine wesentliche Rolle. Natürlich wurde geschaut, dass sich die Objekte ungefähr in der gleichen Höhe und im gleichen Abstand von der Mitte entfernt befinden, trotzdem kann eines der Objekte durch Größe oder Lage der Versuchsperson schneller und öfter ins Auge springen als das Objekt daneben. Selbstverständlich ist auch die Farbe ein großer Einflussfaktor. Es wurde auf gleiche Mattheit bzw. auf gleichen Glanz geachtet, trotzdem ist es wahrscheinlich, dass bestimmte Menschen von gewissen Farben mehr oder weniger angesprochen werden. Weiters haben auch die Tagesverfassung und die Müdigkeit der Probandinnen einen Einfluss auf das Ergebnis. Eine ausgeruhte Person nimmt die Lebensmittel anders wahr als eine Frau, die sich im Stress befindet oder erschöpft ist. Der Zyklus der Frau beeinflusst das Ergebnis wahrscheinlich auch, genauso wie das Gemüt der Frau, also ob es sich um eine ruhige oder aktive Person handelt. Des weiteren muss beachtet werden, dass es generell so ist, dass die Blickfolge in der westlichen Welt von links nach rechts bzw. von oben nach unten erfolgt.[63] Menschen beginnen im Allgemeinen im linken, oberen Eck zu lesen, der nächste natürliche Punkt für eine Blickfolge ist der dieser Ecke am nächsten gelegene Schnittpunkt der Geraden des Goldenen Schnitts. Daher werden wichtige Informationen auch meistens links oben dargstellt bzw. angereiht.[64] Auch eine Eye-Tracking- Studie bewies, dass Menschen generell zuerst links und oben wahrnehmen.[65] Durch die Zwischenbilder mit den Kreuzen wurde versucht, diesen Einfluss so klein wie möglich zu halten. Geräusche bzw. Geruch im Raum können natürlich auch einen Einfluss auf die Wahrnehmung der ProbandInnen haben.

6. Zusammenfassung

Zusammenfassend kann gesagt werden, dass sich das Blickverhalten der einzelnen Gruppen (Untergewichtige, Normalgewichtige, Übergewichtige, Adipöse) statistisch nicht generell signifikant unterscheidet. Zwischen Adipösen und Untergewichtigen gibt es in Bezug auf die Wahrnehmung manchmal einen signifikanten Unterschied, wie zum Beispiel beim paarweisen Vergleich der „Time to first Fixation“ des Bildes „Bananen und Schokolade“, der „Fixation Length“ und der „Observation Length“ des Bildes „Hamburger und Birne“, sowie der „Observation Count“ der Bilder „Chips und Weintrauben“, „Bananen und Schokolade“ bzw. „Schnitzel mit Pommes und Salat“.

Die vorliegenden Ergebnisse zeigen, dass es einen Zusammenhang zwischen BMI und Blickverhalten bezüglich Lebensmittel unterschiedlicher Kaloriendichte gibt, dass dieser aber nicht leicht und einfach zu beschreiben ist, sondern von vielen Faktoren wie Zustand der Personen, Umgebung, Blickfolge etc. abhängig ist.

7. Ausblick

Trotz Vorversuchen, Gedankenexperimenten und unterschiedlichen Konzepten treten im Laufe der Versuchsreihe einige Fehler bzw. Fehlerquellen auf, die bei Wiederholung des Versuches bzw. bei Beginn neuer, ähnlicher Versuche mitbedacht werden sollten.

Es sollte immer darauf geachtet werden, dass sich die Kreuze der Zwischenbilder nicht mit dem Areas of Interests der zu betrachtenden Objekte decken, da es sonst zu eine Verfälschung des Ergebnisses kommen könnte. Da die Versuchsperson inder Regel automatisch nach Ende der Fixierung des Zwischenbildes auf die AOI des neuen Bildes schaut, ist die Time To First Fixation gleich Null und die Fixation Length ist möglicherweise länger als sie sein würde, wenn sich das Kreuz des Zwischenbildes nicht mit dem Objekt decken würde.

Außerdem soll darauf geachtet werden, dass die AOIs genau bestimmt werden und das Objekt genau umrandet wird. Der Objektbereich soll ident dem AOI-Bereich sein. Somit werden visuelle Fixierungen, die knapp neben dem Objekt liegen bzw. dort vorbeischweifen, nicht zu den AOIs gezählt und verfälschen somit auch nicht das Ergebnis.

In zukünftigen derartigen Tests sollten Darstellungen komplexer Speisen gewählt werden. Die visuellen Reize beim Hamburger zum Beispiel sind komplexer als bei einfacheren Lebensmitteln, wie der Birne. Eine Darstellung mit mehreren Speisen ist realitätsnäher als die minimalistische Darstellung und erinnert die Versuchsperson an einen (typischen) Mittagsteller.

8. Anhang

VP	Geschlecht [a=m., b=w.]	Alter [Jahre]	Körper-größe [m]	Körper-gewicht [kg]	Rechts-/Links-händer [a=Re, b= Li]	Ernährungsweise [a=alles, b=Einschränkung]	Ernährungsgewohnheiten [A=Eltern, B=Schule, C=Vorbilder, D=Sonstiges]	Krankheiten [a=ja, b=nein]	Hunger [a=ja, b=nein, c=weiß nicht]	BMI [kg/m²]	Status
1	b	21	1,77	75	a	a	A	b	a	23,94	normalgewichtig
2	b	32	1,56	43	a	a	D	b	a	17,67	untergewichtig
3	b	47	1,62	70	a	a	A	a	b	26,67	übergewichtig
4	b	30	1,7	70	a	a	D	b	b	24,22	normalgewichtig
5	b	23	1,72	80	a	a	A	b	a	27,04	übergewichtig
6	b	25	1,76	70	a	a	A	b	a	22,60	normalgewichtig
7	b	23	1,63	53	a	a	A	b	b	19,95	untergewichtig
8	b	39	1,72	72	b	a	AD	b	b	24,34	normalgewichtig
9	b	32	1,58	51	a	a	A	b	b	20,43	normalgewichtig
10	b	26	1,6	64	a	a	A	b	a	25,00	übergewichtig
11	b	23	1,76	68	a	b	D	b	b	21,95	normalgewichtig
12	b	31	1,57	62	a	a	A	b	b	25,15	übergewichtig
13	b	48	1,58	68	a	a	D	b	b	27,24	übergewichtig
14	b	28	1,7	63	a	a	A	b	b	21,80	normalgewichtig
15	b	21	1,68	53	a	a	D	b	b	18,78	untergewichtig
16	b	25	1,8	72	b	a	A	a	b	22,22	normalgewichtig
17	b	24	1,65	46	a	a	A	b	b	16,90	untergewichtig
18	b	23	1,74	86	a	b	D	b	a	28,41	übergewichtig
19	b	25	1,57	50	a	b	D	b	b	20,28	normalgewichtig
20	b	21	1,61	49	a	a	AD	b	b	18,90	untergewichtig
21	b	22	1,72	55	a	a	A	b	b	18,59	untergewichtig
22	b	20	1,6	50	a	a	A	b	b	19,53	untergewichtig
23	b	23	1,69	75	a	a	A	b	a	26,26	übergewichtig
24	b	56	1,6	107	a	a	A	b	b	41,80	adipös
25	b	20	1,63	67	a	b	A	b	b	25,22	übergewichtig
26	b	22	1,5	43	a	a	D	b	a	19,11	untergewichtig
27	b	19	1,78	59	a	a	A	b	b	18,62	untergewichtig

28	b	22	1,6	70	a	a	A	b	b	27,34	übergewichtig
29	b	34	1,69	67	a	a	A	b	b	23,46	normalgewichtig
30	b	18	1,63	57	a	a	A	b	b	21,45	normalgewichtig
31	b	24	1,7	64	a	a	ABD	b	b	22,15	normalgewichtig
32	b	31	1,65	65	a	a	A	b	b	23,88	normalgewichtig
33	b	45	1,59	64	a	a	D	b	b	25,32	übergewichtig
34	b	56	1,64	68	a	a	D	b	b	25,28	übergewichtig
35	b	22	1,75	80	a	b	A	b	b	26,12	übergewichtig
36	b	25	1,75	75	a	a	A	b	a	24,49	normalgewichtig
37	b	25	1,8	64	a	a	A	b	b	19,75	untergewichtig
38	b	25	1,63	55	a	a	A	b	b	20,70	normalgewichtig
39	b	23	1,73	64	a	a	D	b	b	21,38	normalgewichtig
40	b	43	1,6	90	a	a	A	b	b	35,16	adipös
41	b	25	1,79	60	a	b	AB	b	b	18,73	untergewichtig
42	b	26	1,71	59	a	a	AD	b	b	20,18	normalgewichtig
43	b	28	1,63	54	a	a	A	b	b	20,32	normalgewichtig
44	b	25	1,65	58	a	a	A	b	b	21,30	normalgewichtig
45	b	32	1,63	68	a	a	D	b	a	25,59	übergewichtig
46	b	43	1,6	70	a	a	D	b	b	27,34	übergewichtig
47	b	21	1,75	60	a	b	D	b	b	19,59	untergewichtig
48	b	29	1,58	52	a	a	D	b	b	20,83	normalgewichtig
49	b	30	1,63	57	a	a	D	b	b	21,45	normalgewichtig
50	b	24	1,6	70	a	a	AD	b	b	27,34	übergewichtig
51	b	24	1,6	49	a	a	D	b	a	19,14	untergewichtig
52	b	26	1,65	65	a	a	A	b	b	23,88	normalgewichtig
53	b	39	1,57	52	a	a	A	b	b	21,10	normalgewichtig
54	b	23	1,65	60	a	a	AD	b	b	22,04	normalgewichtig
55	b	24	1,69	67	b	a	A	b	a	23,46	normalgewichtig
56	b	20	1,68	58	a	a	B	b	b	20,55	normalgewichtig
57	b	20	1,7	53	a	a	A	b	b	18,34	untergewichtig
58	b	69	1,5	57	a	a	D	b	b	25,33	übergewichtig
59	b	25	1,65	70	a	b	D	b	b	25,71	übergewichtig
60	b	38	1,7	92	a	a	D	b	b	31,83	adipös
61	b	28	1,68	62	a	a	A	b	a	21,97	normalgewichtig

62	b	24	1,75	79	a	a	A	b	b	25,80	übergewichtig
63	b	20	1,7	65	a	a	AB	b	a	22,49	normalgewichtig
64	b	21	1,6	50	b	a	D	b	b	19,53	untergewichtig
65	b	23	1,62	50	a	b	D	b	b	19,05	untergewichtig
66	b	29	1,61	65	a	a	AD	b	b	25,08	übergewichtig
67	b	22	1,55	50	a	a	A	b	b	20,81	normalgewichtig
68	b	23	1,72	70	a	a	A	b	b	23,66	normalgewichtig
69	b	23	1,58	58	a	a	A	b	b	23,23	normalgewichtig
70	b	24	1,69	69	a	a	A	b	b	24,16	normalgewichtig
71	b	51	1,78	98	a	a	A	b	b	30,93	adipös
72	b	25	1,7	73	a	a	A	b	a	25,26	übergewichtig
73	b	21	1,83	92	a	a	A	b	b	27,47	übergewichtig
74	b	18	1,82	67	a	a	A	b	b	20,23	normalgewichtig
75	b	19	1,7	79	a	a	A	a	b	27,34	übergewichtig
76	b	24	1,73	52	a	a	D	b	a	17,37	untergewichtig
77	b	22	1,79	72	a	a	A	b	b	22,47	normalgewichtig
78	b	30	1,7	54	a	a	A	b	b	18,69	untergewichtig
79	b	23	1,75	83	a	a	A	b	b	27,10	übergewichtig
80	b	27	1,76	80	a	a	A	b	b	25,83	übergewichtig
81	b	25	1,68	88	a	a	A	a	b	31,18	adipös
82	b	28	1,68	71	a	a	A	b	b	25,16	übergewichtig
83	b	25	1,7	62	a	a	A	b	c	21,45	normalgewichtig
84	b	19	1,74	68	a	a	A	b	b	22,46	normalgewichtig
85	b	20	1,58	63	a	a	A	b	b	25,24	übergewichtig
86	b	23	1,62	66	a	a	AD	b	a	25,15	übergewichtig
87	b	34	1,67	115	a	a	AD	b	b	41,23	adipös
88	b	31	1,6	69	a	a	AD	b	b	26,95	übergewichtig
89	b	31	1,56	42	a	a	AB	b	a	17,26	untergewichtig
90	b	40	1,62	79	a	a	AD	a	b	30,10	adipös
91	b	37	1,62	92	a	a	A	b	b	35,06	adipös
92	b	58	1,56	75	a	a	A	b	b	30,82	adipös
93	b	66	1,58	75	a	a	D	b	b	30,04	adipös
94	b	22	1,6	77	a	a	A	a	b	30,08	adipös
95	b	19	1,6	50	a	a	A	b	b	19,53	untergewichtig

96	b	19	1,6	53	a	a	A	b	b	20,70	normalgewichtig
97	b	18	1,58	63	b	a	B	b	c	25,24	übergewichtig
98	b	23	1,67	70	b	a	D	b	b	25,10	übergewichtig
99	b	18	1,72	80	a	a	AD	b	b	27,04	übergewichtig
100	b	22	1,83	62	a	a	A	b	a	18,51	untergewichtig
101	b	37	1,65	82	a	a	A	b	b	30,12	adipös
102	b	44	1,6	90	a	a	A	b	a	35,16	adipös
103	b	38	1,53	79	a	a	A	b	b	33,75	adipös
104	b	20	1,78	73	a	a	A	b	b	23,04	normalgewichtig
105	b	23	1,67	72	a	a	A	b	b	25,82	übergewichtig
106	b	58	1,64	76	a	a	A	b	a	28,26	übergewichtig
107	b	36	1,65	64	a	a	D	a	a	23,51	normalgewichtig
108	b	21	1,62	55	b	a	A	b	b	20,96	normalgewichtig
109	b	57	1,65	70	a	a	D	b	b	25,71	übergewichtig
110	b	24	1,58	55	a	a	D	b	b	22,03	normalgewichtig
111	b	67	1,7	100	a	a	AD	a	b	34,60	adipös
112	b	75	1,68	98	a	a	A	a	b	34,72	adipös
113	b	40	1,66	75	a	a	A	b	a	27,22	übergewichtig
114	b	39	1,63	80	a	a	A	b	a	30,11	adipös
115	b	20	1,69	69	b	a	A	b	c	24,16	normalgewichtig
116	b	24	1,68	62	a	a	A	b	b	21,97	normalgewichtig
117	b	20	1,66	55	a	a	A	b	b	19,96	untergewichtig
118	b	29	1,65	59	a	a	AD	b	a	21,67	normalgewichtig
119	b	19	1,72	59	a	a	A	b	b	19,94	untergewichtig
120	b	21	1,63	56	a	a	D	b	b	21,08	normalgewichtig
121	b	27	1,6	41	a	a	A	b	a	16,02	untergewichtig
122	b	20	1,83	70	a	a	A	b	b	20,90	normalgewichtig
123	b	20	1,67	55	a	a	D	a	b	19,72	untergewichtig
124	b	33	1,67	110	a	a	A	a	b	39,44	adipös
125	b	30	1,66	108	a	a	AB	a	b	39,19	adipös
126	b	24	1,69	57	a	a	A	b	b	19,96	untergewichtig
127	b	48	1,6	70	a	a	A	b	c	27,34	übergewichtig
128	b	45	1,6	75	a	a	A	b	a	29,30	übergewichtig
129	b	23	1,63	62	a	a	D	b	b	23,34	normalgewichtig

130	b	23	1,67	65	a	a	D	b	b	23,31	normalgewichtig
131	b	30	1,76	70	a	a	AD	b	b	22,60	normalgewichtig
132	b	32	1,6	92	a	a	D	b	b	35,94	adipös
133	b	35	1,58	90	a	a	D	b	b	36,05	adipös
134	b	36	1,7	53	a	a	A	b	b	18,34	untergewichtig
135	b	20	1,63	67	a	a	A	b	b	25,22	übergewichtig
136	b	68	1,65	75	a	a	D	b	b	27,55	übergewichtig
137	b	65	1,66	76	a	a	D	b	b	27,58	übergewichtig
138	b	81	1,66	69	a	a	D	b	c	25,04	übergewichtig
139	b	20	1,62	70	a	a	A	b	b	26,67	übergewichtig
140	b	20	1,68	50	b	a	A	b	b	17,72	untergewichtig
141	b	20	1,63	60	a	a	A	b	b	22,58	normalgewichtig
142	b	23	1,59	90	a	a	A	b	b	35,60	adipös

9. Lebenslauf

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09/04	Bewag, Oberwart, Büro
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Lebenslauf

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Abteilung für Lebensmittelqualitätssicherung (LQS)

UNTERSUCHUNGEN ZUR BMI-ABHÄNGIGKEIT DES BLICKVERHALTENS VON FRAUEN BEI LEBENSMITTELN MIT UNTERSCHIEDLICHEM KALORIENGEHALT MIT HILFE EINES TOBII EYE TRACKERS

Masterarbeit

Details zur Berechnung und Urdaten

eingereicht von:

JENNIFER MARIA WALLNER

Inhaltsangabe

1. Details zur Berechnung

1.1 Parameter

1.1.1 First Fixation

1.1.1.1 Hamburger und Birne

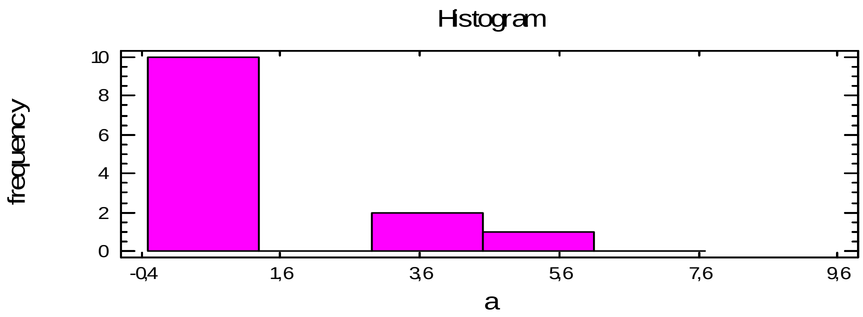
1.1.1.1.1 Prüfung auf Normalverteilung

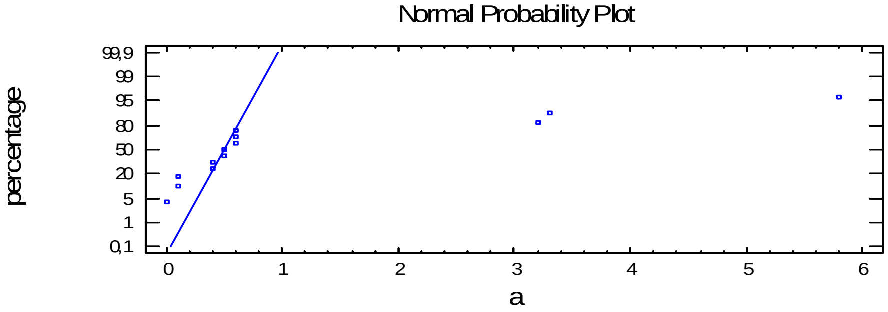
Tabelle 1: Fett – Nichtfett –Verhältnis - First Fixation [s] der vier Gruppen - Hamburger und Birne

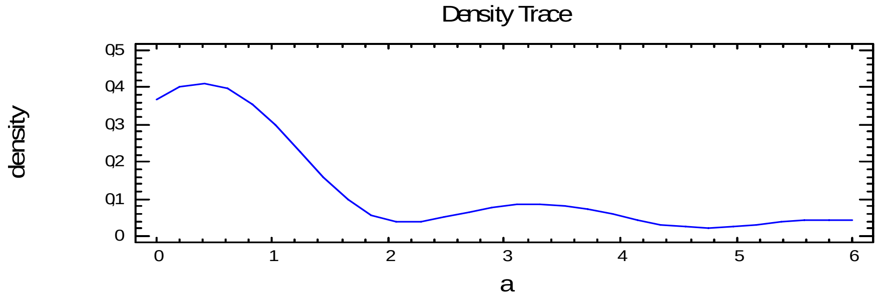
ug	ng	üg	a
0,0	2,5	0,2	0,8
0,6	1,8	0,0	0,5
0,0	0,9	3,7	0,0
0,0	3,3	0,9	0,2
0,0	0,3	3,4	0,4
0,4	0,0	0,3	5,8
0,9	0,0	0,8	0,6
0,0	2,1	0,0	4,0
0,0	1,5	0,0	2,9
2,4	0,9	1,1	0,6
1,7	2,6	9,2	0,0
20,4	0,3	11,1	0,4
1,0	5,2	0,5	0,6
1,3	0,4	0,8	3,3
0,3	3,9	3,6	0,4
0,0	0,6	3,0	1,2
0,8	4,2	0,2	0,1
1,3	4,0	1,5	0,5
0,8	2,2	0,0	3,2
3,2	3,0	2,0	
0,2	0,0	0,0	0,1

0,0	0,1	15,1	2,5
	5,4	0,7	
	3,2	0,5	
	1,9	1,7	
	0,7	1,2	
	20,9	0,5	
	0,0	0,1	
	7,3	0,0	
	9,7	0,7	
	5,7	0,0	
	18,5	4,3	
	0,0	1,6	
	2,2	1,6	
	0,0	0,4	
	0,4	3,8	
	0,3	1,8	
	0,3	4,5	
	2,3	0,9	
	14,8	0,1	
	0,4	0,0	
	0,8		
	1,0		
	1,0		
	7,4		
	0,1		

Die Gruppe der Untergewichtigen (ug) wird mit der Gruppe der Adipösen (a) verglichen.







Summary Statistics for a

Count = 13

Average = 1,23846

Variance = 3,06256

Standard deviation = 1,75002

Minimum = 0,0

Maximum = 5,8

Range = 5,8

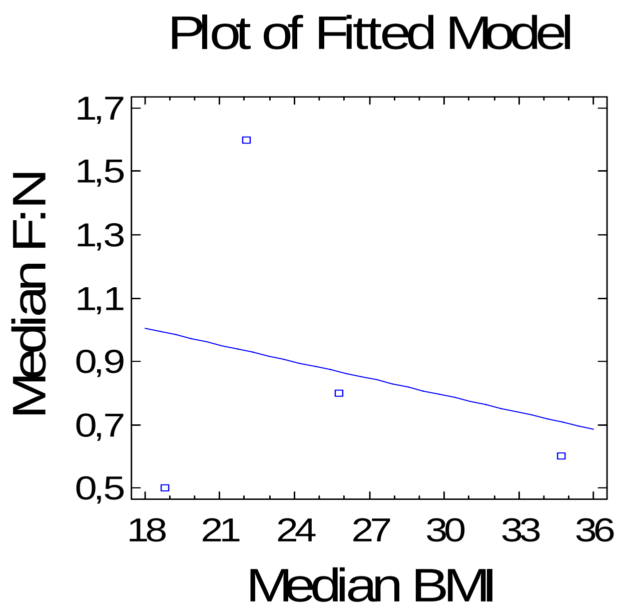
Stnd. skewness = 2,8024

Stnd. kurtosis = 2,23375

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

1.1.1.1.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N

Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	1,32508	1,29958	1,01962	0,4152
Slope	-0,0177546	0,049914	-0,355704	0,7561

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,0444753	1	0,0444753	0,13	0,7561
Residual	0,703025	2	0,351512		
Total (Corr.)	0,7475	3			

Correlation Coefficient = -0,243924
R-squared = 5,94988 percent
R-squared (adjusted for d.f.) = -41,0752 percent
Standard Error of Est. = 0,592885
Mean absolute error = 0,333649
Durbin-Watson statistic = 2,67886 (P=0,0074)
Lag 1 residual autocorrelation = -0,519542

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

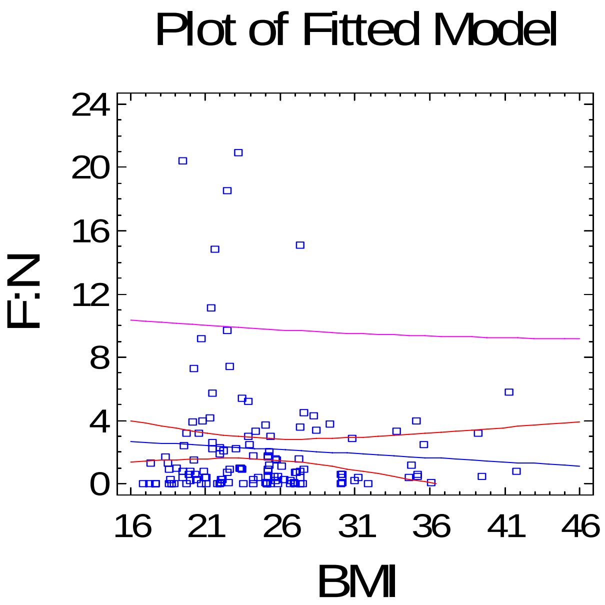
Median F:N = 1,32508 - 0,0177546*Median BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between Median F:N and Median BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 5,94988% of the variability in Median F:N. The correlation coefficient equals -0,243924, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,592885. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,333649 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation. Plot the residuals versus row order to see if there is any pattern which can be seen.

1.1.1.1.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	3,50325	1,63497	2,1427	0,0340
Slope	-0,0515328	0,064544	-0,798414	0,4261

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	9,24078	1	9,24078	0,64	0,4261
Residual	1855,51	128	14,4961		
Total (Corr.)	1864,75	129			

Correlation Coefficient = -0,0703954

R-squared = 0,495552 percent

R-squared (adjusted for d.f.) = -0,281827 percent

Standard Error of Est. = 3,80738

Mean absolute error = 2,33888

Durbin-Watson statistic = 2,05838 (P=0,3703)

Lag 1 residual autocorrelation = -0,0293923

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 3,50325 - 0,0515328*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 0,495552% of the variability in F:N. The correlation coefficient equals -0,0703954, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 3,80738. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 2,33888 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.1.1.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Linear	-0,2439	5,95%
Square root-X	-0,2192	4,81%
Square root-Y	-0,2144	4,60%
Logarithmic-X	-0,1920	3,69%
Exponential	-0,1773	3,14%
Reciprocal-X	0,1312	1,72%
Multiplicative	-0,1165	1,36%

Reciprocal-Y	0,0832	0,69%
Double reciprocal	0,0621	0,39%
S-curve	0,0476	0,23%
Logistic	<no fit>	
Log probit	<no fit>	

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the linear model yields the highest R-Squared value with 5,94988%. This is the currently selected model.

1.1.1.1.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 0,5

Median of sample 2: 0,6

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 21,0652

Average rank of sample 2: 25,0227

W = 297,5 P-value = 0,314445

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,363636
Two-sided large sample K-S statistic = 1,19194
Approximate P value = 0,116695

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,363636, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.1.1.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	65,0471	3	21,6824	1,52	0,2131
Within groups	1799,7	126	14,2833		
Total (Corr.)	1864,75	129			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 1,51802, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

	Count	Mean	Homogeneous Groups
a	21	1,3381	X
ug	22	1,60455	X
üg	41	1,99512	X
ng	46	3,13261	X

Contrast	Difference	+/- Limits
a - ng	-1,79451	1,96972
a - ug	-0,26645	2,28175
a - üg	-0,657027	2,00701

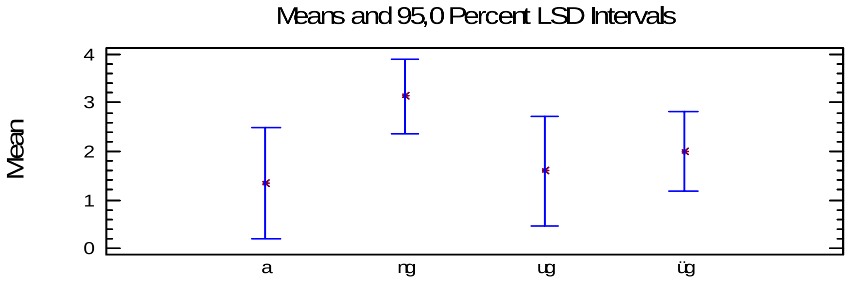
ng - ug	1,52806	1,93874
ng - üg	1,13749	1,60636
ug - üg	-0,390576	1,97661

----

* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.1.1.7 Paarweiser Vergleich (Adipös vs. Nicht-Adipös)

Comparison of Medians

Median of sample 1: 0,9

Median of sample 2: 0,6

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 66,2431

Average rank of sample 2: 61,6429

W = 1063,5   P-value = 0,609312

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	19,7182	1	19,7182	1,37	0,2443
Within groups	1845,03	128	14,4143		
Total (Corr.)	1864,75	129			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 1,36796, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 2 variables at the 95,0% confidence level.

1.1.1.1.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

Alter
Birne
BMI
EGew
EWeise
F
F:N
Hamb
Hamb:Birne

Händer
Hunger
Krankh
N
Status

Data input: observations
Number of complete cases: 128
Missing value treatment: listwise
Standardized: yes

Number of components extracted: 6

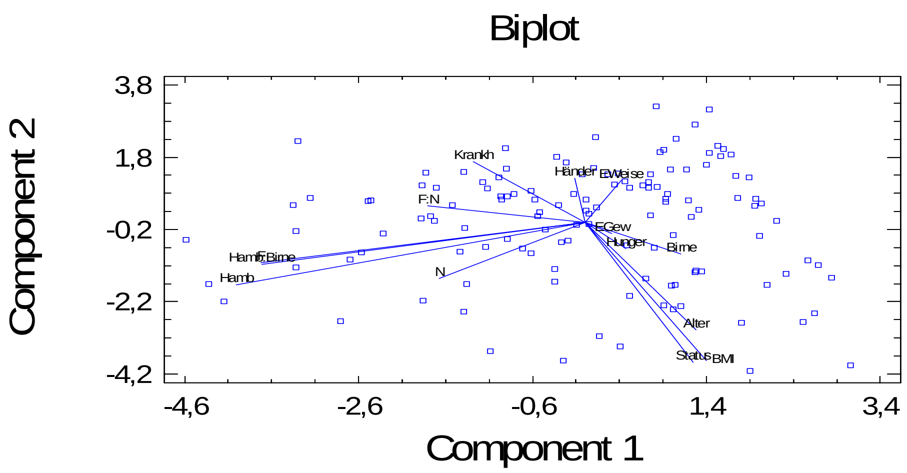
Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,67591	19,114	19,114
2	2,5164	17,974	37,088
3	1,88562	13,469	50,557
4	1,20168	8,583	59,140
5	1,10933	7,924	67,064
6	1,05687	7,549	74,613
7	0,913585	6,526	81,139
8	0,826409	5,903	87,041
9	0,712796	5,091	92,133
10	0,51659	3,690	95,823
11	0,263854	1,885	97,707
12	0,213155	1,523	99,230
13	0,0958437	0,685	99,915
14	0,0119594	0,085	100,000

The StatAdvisor

This procedure performs a principal components analysis. The

purpose of the analysis is to obtain a small number of linear combinations of the 14 variables which account for most of the variability in the data. In this case, 6 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 74,6129% of the variability in the original data.



1.1.1.2 Praline und Erdbeere

1.1.1.2.1 Prüfung auf Normalverteilung

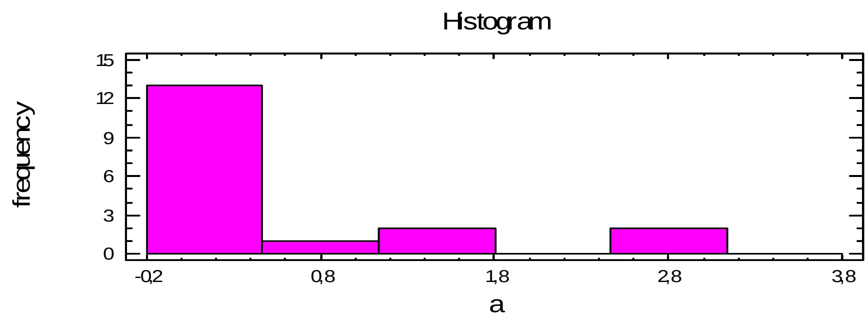
Tabelle 2: Fett – Nichtfett –Verhältnis - First Fixation [s] der vier Gruppen - Praline und Erdbeere

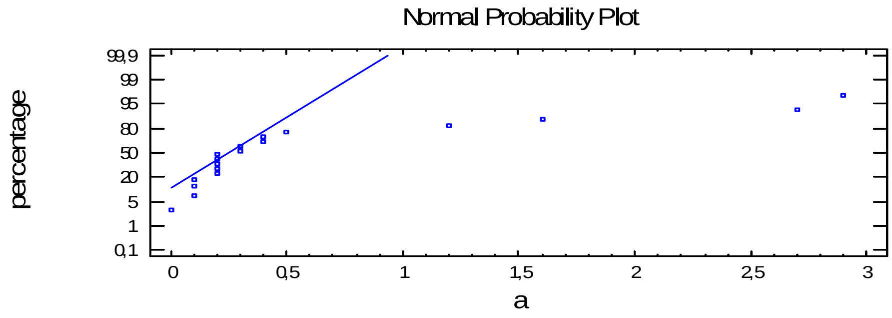
ug	ng	üg	a
0,3	0,2	0,3	0,5
0,6	1,5	1,8	0,0
0,4	0,2	0,2	0,1
0,2	0,3	0,3	0,3
0,2	0,1	0,1	1,6
0,4	0,2	0,3	0,1
	0,1	0,2	0,2
0,2	0,1	0,2	0,2
0,0	0,2	0,4	0,0
0,4	2,0	0,2	0,2
0,1	0,1	0,3	0,4
0,2	0,1	0,2	0,2

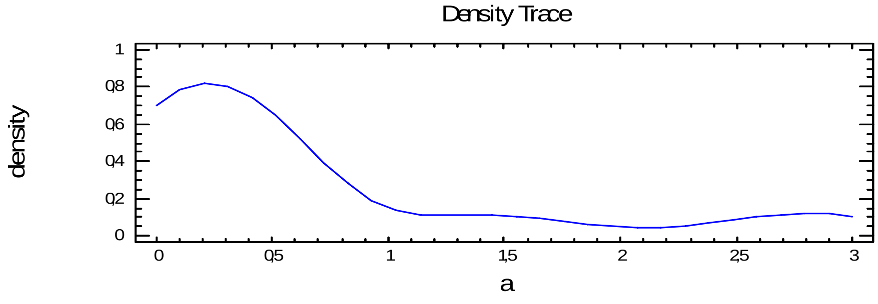
2,2	0,6	2,1	0,4
0,1	0,1	0,0	
0,2	0,3	0,3	0,1
0,2	0,1	0,4	1,2
1,7	0,2	0,1	0,2
1,7	0,4	0,0	2,7
0,4	0,3	0,3	2,9
0,2	0,2		0,2
0,1	0,1	1,6	0,3
0,1	0,2	0,1	
0,3	0,5	0,2	
	0,3	0,0	
	0,1	0,2	
	0,3	0,1	
	4,9	0,7	
	0,1	0,3	
	0,2	0,1	
	0,2	2,0	
	0,3		
	0,1	0,1	
	0,1	0,3	
	1,6	0,4	
	0,2	0,1	
	0,1	0,2	
	0,1	0,2	
	0,2	0,2	
	0,2	2,6	
	0,1		
	0,1		

	0,1		
	0,6		
	0,3		
	0,2		
	0,2		
	0,2		
	0,1		
	0,1		

Die Gruppe der Untergewichtigen (ug) wird mit der Gruppe der Adipösen (a) verglichen.







Summary Statistics for a

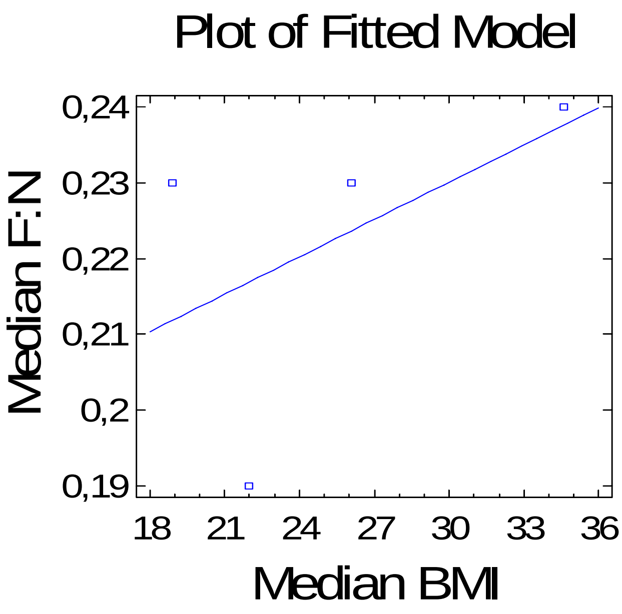
Count = 18

Average = 0,644444
Variance = 0,776732
Standard deviation = 0,881324
Minimum = 0,0
Maximum = 2,9
Range = 2,9
Stnd. skewness = 3,33201
Stnd. kurtosis = 2,32604

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

1.1.1.2.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N

Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	0,180819	0,0518988	3,48407	0,0734
Slope	0,001641	0,00199038	0,824464	0,4964

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,000374147	1	0,000374147	0,68	0,4964
Residual	0,00110085	2	0,000550426		
Total (Corr.)	0,001475	3			

Correlation Coefficient = 0,503646

R-squared = 25,3659 percent
R-squared (adjusted for d.f.) = -11,9511 percent
Standard Error of Est. = 0,0234612
Mean absolute error = 0,0134603
Durbin-Watson statistic = 2,86637 (P=0,0025)
Lag 1 residual autocorrelation = -0,585703

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

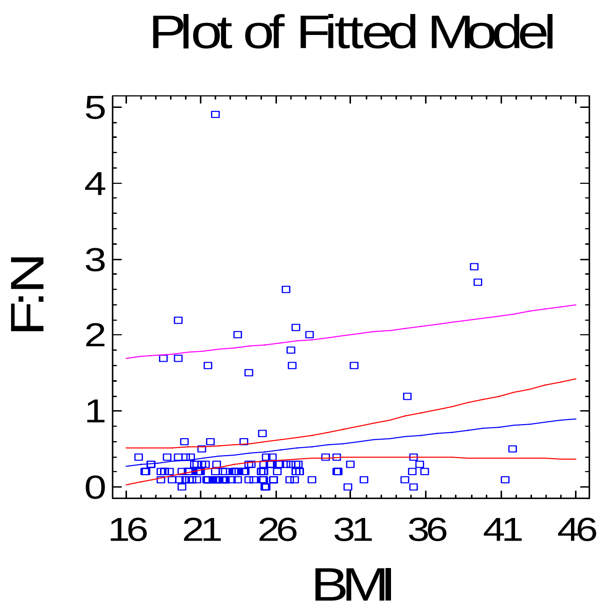
Median F:N = 0,180819 + 0,001641*Median BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between Median F:N and Median BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 25,3659% of the variability in Median F:N. The correlation coefficient equals 0,503646, indicating a moderately strong relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,0234612. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,0134603 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation. Plot the residuals versus row order to see if there is any pattern which can be seen.

1.1.1.2.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	-0,0597714	0,306189	-0,195211	0,8455
Slope	0,0208575	0,0121507	1,71657	0,0885

Analysis of Variance

Source Sum of Squares Df Mean Square F-Ratio P-Value

Model	1,48254	1	1,48254	2,95	0,0885
Residual	63,3947	126	0,503132		
Total (Corr.)	64,8772	127			

Correlation Coefficient = 0,151167

R-squared = 2,28514 percent

R-squared (adjusted for d.f.) = 1,50963 percent

Standard Error of Est. = 0,709318

Mean absolute error = 0,427704

Durbin-Watson statistic = 2,03351 (P=0,4253)

Lag 1 residual autocorrelation = -0,0183633

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = -0,0597714 + 0,0208575*BMI

Since the P-value in the ANOVA table is less than 0.10, there is a statistically significant relationship between F:N and BMI at the 90% confidence level.

The R-Squared statistic indicates that the model as fitted explains 2,28514% of the variability in F:N. The correlation coefficient

equals 0,151167, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,709318. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,427704 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.1.2.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Linear	0,5036	25,37%
Square root-Y	0,4956	24,56%
Logistic	0,4921	24,22%
Exponential	0,4877	23,79%
Square root-X	0,4870	23,72%
Reciprocal-Y	-0,4726	22,34%
Logarithmic-X	0,4677	21,88%
Log probit	0,4588	21,05%
Multiplicative	0,4523	20,46%
Reciprocal-X	-0,4217	17,79%
S-curve	-0,4069	16,56%
Double reciprocal	0,3929	15,44%

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the linear model yields the highest R-Squared value with 25,3659%. This is the currently selected model.

1.1.1.2.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 0,2

Median of sample 2: 0,2

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 21,5455

Average rank of sample 2: 21,45

W = 219,0   P-value = 0,98975

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the

average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,322727
Two-sided large sample K-S statistic = 1,04457
Approximate P value = 0,225737

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,322727, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.1.2.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	0,576353	3	0,192118	0,37	0,7744
Within groups	64,3008	124	0,518555		
Total (Corr.)	64,8772	127			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,370487, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

	Count	Mean	Homogeneous Groups
ng	49	0,389796	X
üg	37	0,462162	X
ug	22	0,463636	X
a	20	0,59	X

Contrast	Difference	+/- Limits
a - ng	0,200204	0,378196
a - ug	0,126364	0,440356
a - üg	0,127838	0,395573
ng - ug	-0,0738404	0,365785
ng - üg	-0,0723662	0,310424
ug - üg	0,0014742	0,383724

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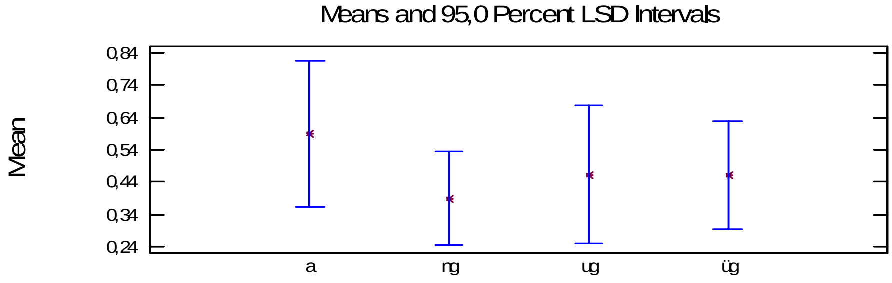
* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine

which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.1.2.7   Paarweiser Vergleich (Adipös vs. Nicht-Adipös)

Comparison of Medians

Median of sample 1: 0,2

Median of sample 2: 0,2

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 63,5417

Average rank of sample 2: 69,675

W = 1183,5   P-value = 0,48865

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	0,434002	1	0,434002	0,85	0,3587
Within groups	64,4432	126	0,511454		
Total (Corr.)	64,8772	127			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,848566, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 2 variables at the 95,0% confidence level.

1.1.1.2.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:
Alter
BMI
EGew
Erdbeere
EWeise
F:N
Händer
Hunger
Krankh
Praline
Status

Data input: observations
Number of complete cases: 128
Missing value treatment: listwise
Standardized: yes

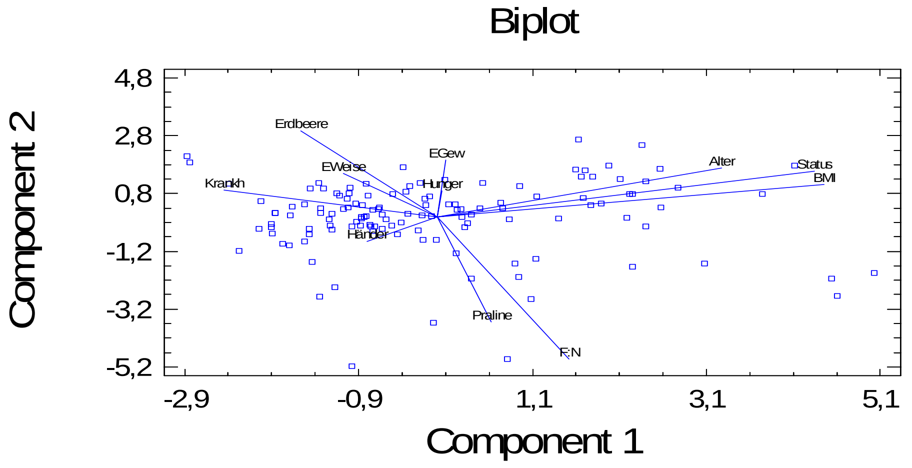
Number of components extracted: 5

Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,57725	23,430	23,430
2	1,61739	14,704	38,133
3	1,21882	11,080	49,213
4	1,129	10,264	59,477
5	1,04985	9,544	69,021
6	0,916603	8,333	77,354
7	0,804954	7,318	84,671
8	0,707299	6,430	91,101
9	0,505692	4,597	95,699
10	0,390006	3,546	99,244
11	0,0831412	0,756	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 11 variables which account for most of the variability in the data. In this case, 5 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 69,021% of the variability in the original data.



1.1.1.3 Chips und Weintrauben

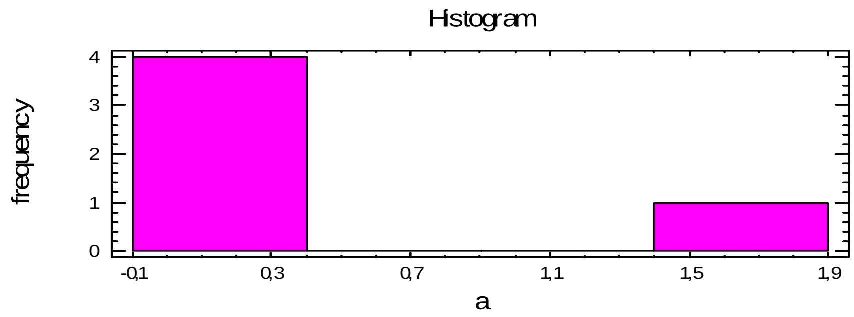
1.1.1.3.1 Prüfung auf Normalverteilung

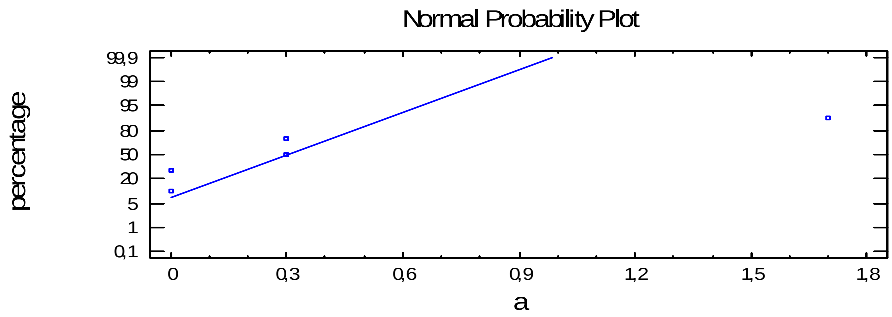
Tabelle 3: Fett – Nichtfett –Verhältnis - First Fixation [s] der vier Gruppen - Chips und Weintrauben

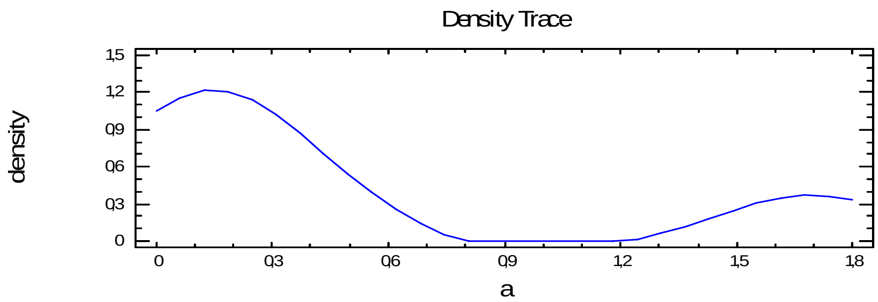
ug	ng	üg	a
0,3		0,2	0,3
	0,2	0,0	0,1
	0,2		0,3
	1,6	0,2	
0,4		0,2	
0,0	0,2	0,2	0,1
	0,2	0,7	0,0
0,4		0,0	0,3
		3,2	
	0,1	4,6	0,1
	0,4		0,4
0,3	0,1		0,0
3,1	0,3		1,7
1,8		0,3	0,0
	0,0	2,9	0,0
	0,3	0,5	0,0
	0,1		
0,0	3,2		
	10,2	8,3	
	0,4	0,4	
	2,2		
	3,3	0,0	
		0,0	
	0,4		

	67,6	0,0	
	0,3	6,5	
	0,0		
		0,3	
	0,2		
	0,4		
	0,3	2,0	
	0,4		
		0,2	
	1,3	0,2	
	0,2	0,0	
	0,0	0,3	
	0,0		
	0,1		
	0,3		
	0,5		
	1,4		
	0,0		
	0,2		

Die Gruppe der Untergewichtigen (ug) wird mit der Gruppe der Adipösen (a) verglichen.







Summary Statistics for a

Count = 5

Average = 0,46

Variance = 0,503

Standard deviation = 0,709225

Minimum = 0,0

Maximum = 1,7

Range = 1,7

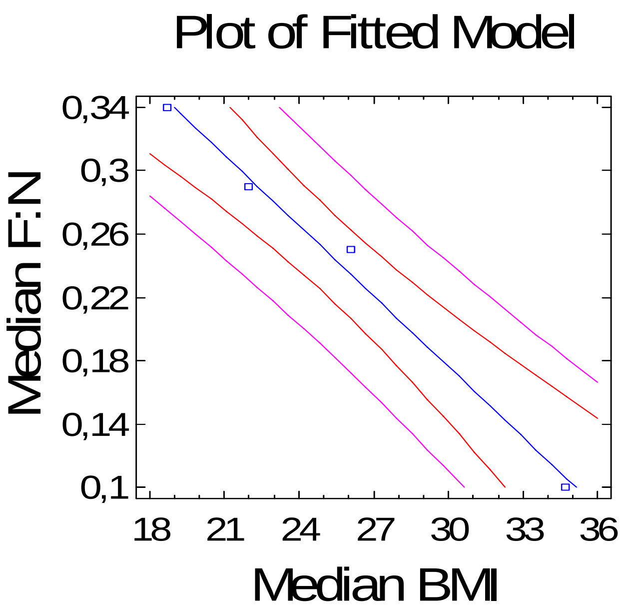
Stnd. skewness = 1,81658

Stnd. kurtosis = 1,88479

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is within the range expected for data from a normal distribution. The standardized kurtosis value is within the range expected for data from a normal distribution.

1.1.1.3.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N

Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	0,622633	0,0281411	22,1254	0,0020
Slope	-0,0148821	0,00107936	-13,7878	0,0052

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,0317658	1	0,0317658	190,10	0,0052
Residual	0,000334193	2	0,000167097		
Total (Corr.)	0,0321	3			

Correlation Coefficient = -0,994781
R-squared = 98,9589 percent
R-squared (adjusted for d.f.) = 98,4383 percent
Standard Error of Est. = 0,0129266
Mean absolute error = 0,00789476
Durbin-Watson statistic = 2,77416 (P=0,0042)
Lag 1 residual autocorrelation = -0,473202

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

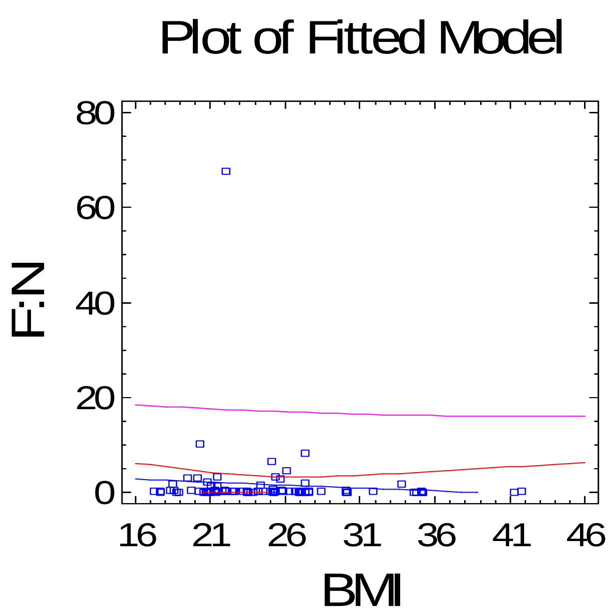
Median F:N = 0,622633 - 0,0148821*Median BMI

Since the P-value in the ANOVA table is less than 0.01, there is a statistically significant relationship between Median F:N and Median BMI at the 99% confidence level.

The R-Squared statistic indicates that the model as fitted explains 98,9589% of the variability in Median F:N. The correlation coefficient equals -0,994781, indicating a relatively strong relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,0129266. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,00789476 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation. Plot the residuals versus row order to see if there is any pattern which can be seen.

1.1.1.3.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

		Standard	T	
Parameter	Estimate	Error	Statistic	P-Value

Intercept	4,77576	4,25161	1,12328	0,2648
Slope	-0,12315	0,167782	-0,733987	0,4652

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	31,8581	1	31,8581	0,54	0,4652
Residual	4612,51	78	59,1347		
Total (Corr.)	4644,37	79			

Correlation Coefficient = -0,0828221

R-squared = 0,685951 percent

R-squared (adjusted for d.f.) = -0,587306 percent

Standard Error of Est. = 7,68991

Mean absolute error = 2,4145

Durbin-Watson statistic = 2,07273 (P=0,3632)

Lag 1 residual autocorrelation = -0,0373017

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 4,77576 - 0,12315*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 0,685951% of the variability in F:N. The correlation coefficient equals -0,0828221, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 7,68991. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 2,4145 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.1.3.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Linear	-0,9948	98,96%
Square root-X	-0,9903	98,07%

Square root-Y	-0,9867	97,35%
Logarithmic-X	-0,9838	96,78%
Logistic	-0,9818	96,38%
Exponential	-0,9751	95,08%
Log probit	-0,9667	93,46%
Reciprocal-X	0,9643	92,98%
Multiplicative	-0,9521	90,66%
Reciprocal-Y	0,9487	90,00%
S-curve	0,9207	84,78%
Double reciprocal	-0,8774	76,98%

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the linear model yields the highest R-Squared value with 98,9589%. This is the currently selected model.

1.1.1.3.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 0,35

Median of sample 2: 0,1

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

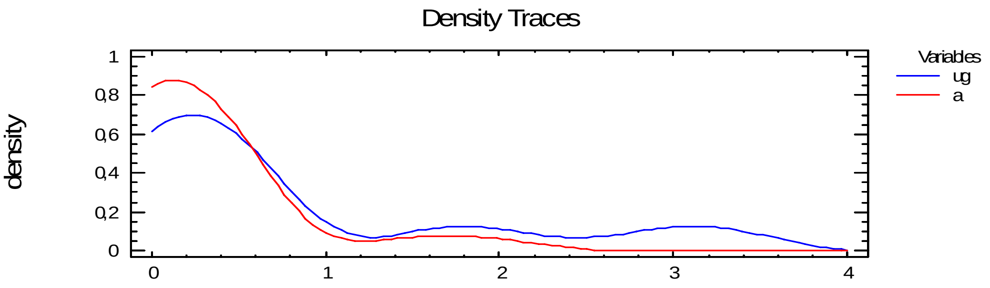
Average rank of sample 1: 13,625

Average rank of sample 2: 9,38462

W = 31,0   P-value = 0,126798

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.



Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,596154
Two-sided large sample K-S statistic = 1,32668
Approximate P value = 0,059191

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,596154, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.1.3.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	76,9904	3	25,6635	0,43	0,7342
Within groups	4567,89	76	60,1038		
Total (Corr.)	4644,88	79			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,426986, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

	Count	Mean	Homogeneous Groups

----

a	13	0,253846	X
ug	8	0,7875	X
üg	24	1,3	X
ng	35	2,76	X

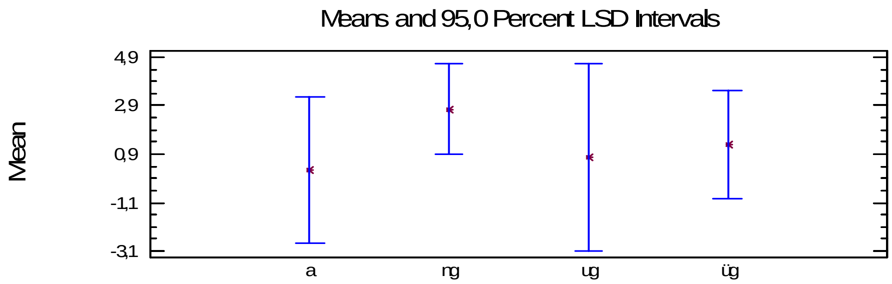
Contrast	Difference	+/- Limits
a - ng	-2,50615	5,01516
a - ug	-0,533654	6,93845
a - üg	-1,04615	5,31732
ng - ug	1,9725	6,05097
ng - üg	1,46	4,09219
ug - üg	-0,5125	6,30368

----

* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.1.3.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 0,3

Median of sample 2: 0,1

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 42,8134

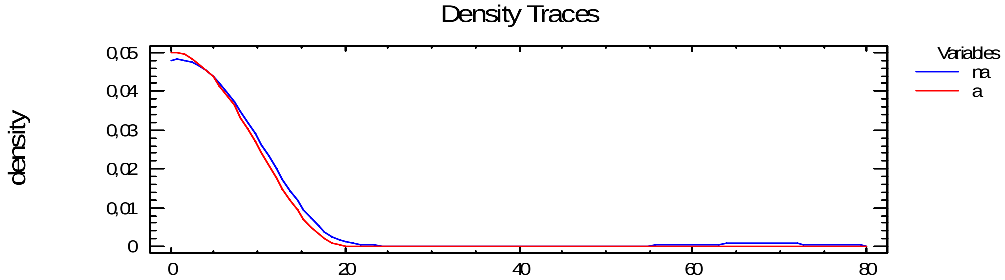
Average rank of sample 2: 28,5769

W = 280,5   P-value = 0,041602

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the

average ranks of the two samples in the combined data. Since the P-value is less than 0,05, there is a statistically significant difference between the medians at the 95,0% confidence level.



ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	33,3209	1	33,3209	0,56	0,4551
Within groups	4611,05	78	59,116		
Total (Corr.)	4644,37	79			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,563653, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 2 variables at the 95,0% confidence level.

1.1.1.3.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:
- Alter
- BMI
- Chips
- EGew
- EWeise
- F:N
- Händer
- Hunger
- Krankh
- Status
- Weintrauben

Data input: observations
Number of complete cases: 79
Missing value treatment: listwise
Standardized: yes

Number of components extracted: 4

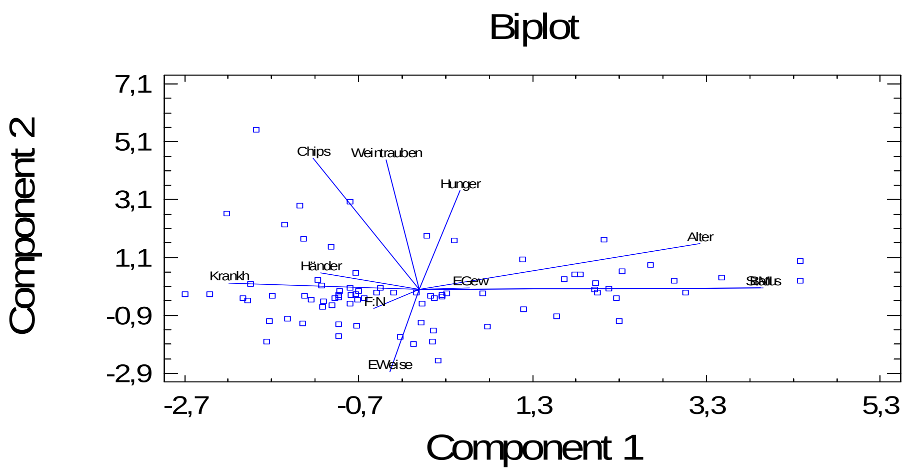
Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,6085	23,714	23,714
2	1,50643	13,695	37,408
3	1,33514	12,138	49,546

4	1,09073	9,916	59,462
5	0,987964	8,981	68,443
6	0,947863	8,617	77,060
7	0,802836	7,299	84,359
8	0,774316	7,039	91,398
9	0,51081	4,644	96,042
10	0,350226	3,184	99,226
11	0,0851893	0,774	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 11 variables which account for most of the variability in the data. In this case, 4 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 59,4618% of the variability in the original data.



1.1.1.4 Bananen und Schokolade

1.1.1.4.1 Prüfung auf Normalverteilung

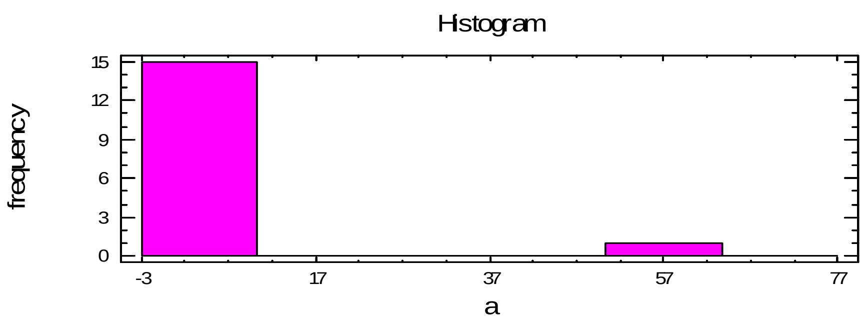
Tabelle 4: Fett – Nichtfett –Verhältnis - First Fixation [s] der vier Gruppen - Bananen und Schokolade

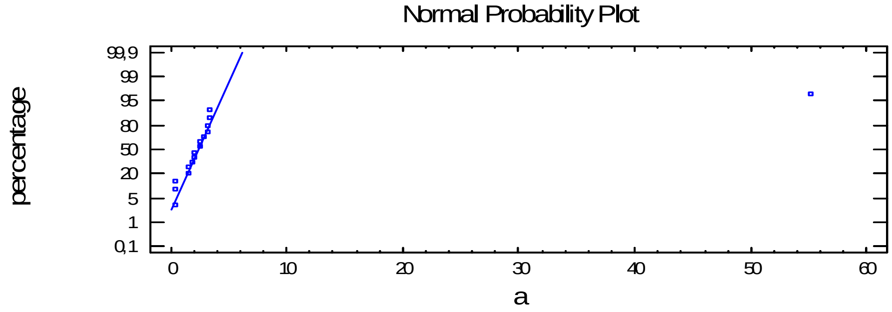
ug	ng	üg	a
2,8	3,9	0,1	

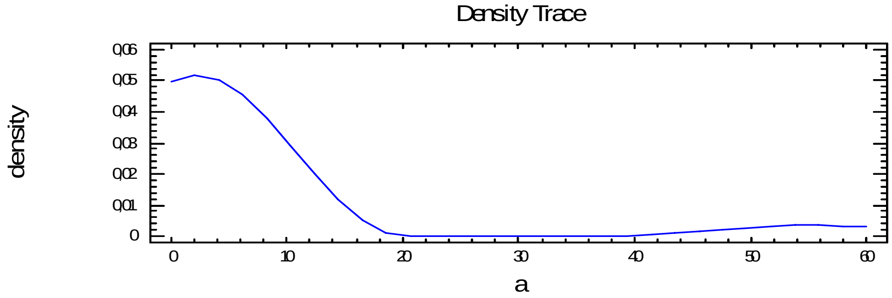
3,6	0,4	1,8	55,1
1,7	2,8	1,7	3,4
1,9	2,2	1,9	2,6
0,6	6,4	2,6	3,2
0,3	5,4	0,2	3,3
3,0	2,4	3,0	
2,2	7,6	0,5	2,1
0,3	3,2	0,3	1,6
1,9	0,2	2,4	2,0
2,9	5,4	1,8	1,9
2,2		2,5	
1,9	0,2	0,1	0,4
2,0	2,1	3,6	3,2
5,4	10,0	3,7	2,9
		1,7	6,7
9,5	0,3	0,2	0,4
0,4	1,6		0,4
2,3	3,2	1,5	1,5
0,5	2,3	0,3	
0,2	1,7	1,4	2,6
2,0	2,6	2,0	
2,8	2,7	4,6	
0,2	0,5		
0,5	2,9	1,9	
	0,7		
	0,2		
	2,2	1,6	
	1,2	1,6	
	2,7	3,3	

	3,0	0,3	
	1,5		
	3,5	15,2	
	0,2	8,2	
	1,6	4,1	
	3,6	1,5	
	2,1	4,3	
		9,2	
	0,5	2,3	
	0,1	0,3	
	0,3		
	0,1		
	3,0		
	1,7		
	2,7		
	0,4		
	15,5		
	0,4		
	3,0		

Die Gruppe der Untergewichtigen (ug) wird mit der Gruppe der Adipösen (a) verglichen.







Summary Statistics for a

Count = 16

Average = 5,4125

Variance = 176,631

Standard deviation = 13,2902

Minimum = 0,4

Maximum = 55,1

Range = 54,7

Stnd. skewness = 6,46397

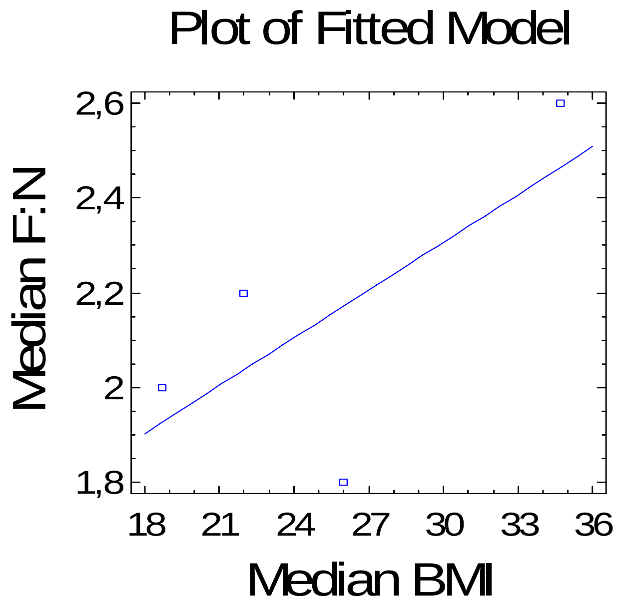
Stnd. kurtosis = 12,873

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized

skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

1.1.1.4.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N

Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	1,29904	0,668086	1,94443	0,1913
Slope	0,0335683	0,0256493	1,30874	0,3208

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,161463	1	0,161463	1,71	0,3208
Residual	0,188537	2	0,0942683		

Total (Corr.)	0,35	3

Correlation Coefficient = 0,679209

R-squared = 46,1324 percent

R-squared (adjusted for d.f.) = 19,1986 percent

Standard Error of Est. = 0,307031

Mean absolute error = 0,18591

Durbin-Watson statistic = 2,92478 (P=0,0016)

Lag 1 residual autocorrelation = -0,525762

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

Median F:N = 1,29904 + 0,0335683*Median BMI

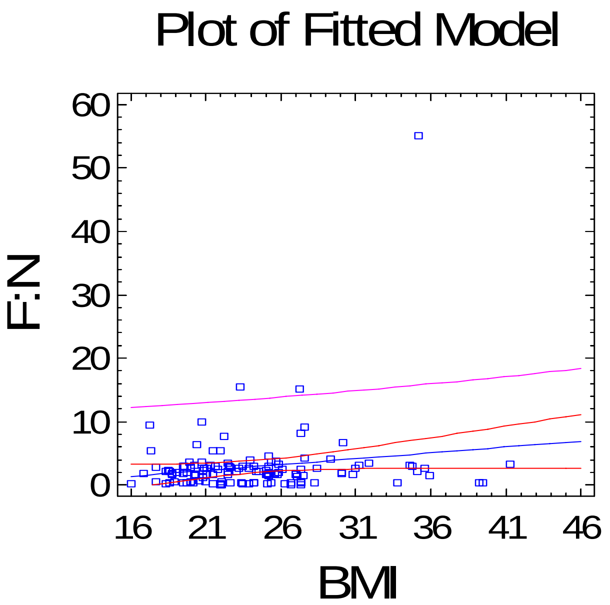
Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between Median F:N and Median BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 46,1324% of the variability in Median F:N. The correlation coefficient equals 0,679209, indicating a moderately strong relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,307031. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,18591 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation.

Plot the residuals versus row order to see if there is any pattern which can be seen.

1.1.1.4.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	-1,5862	2,38931	-0,663873	0,5080
Slope	0,185037	0,09606	1,92626	0,0564

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	106,408	1	106,408	3,71	0,0564
Residual	3441,31	120	28,6776		
Total (Corr.)	3547,72	121			

Correlation Coefficient = 0,173186

R-squared = 2,99933 percent

R-squared (adjusted for d.f.) = 2,19099 percent

Standard Error of Est. = 5,35515

Mean absolute error = 2,30273

Durbin-Watson statistic = 1,78247 (P=0,1156)

Lag 1 residual autocorrelation = 0,107766

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = -1,5862 + 0,185037*BMI

Since the P-value in the ANOVA table is less than 0.10, there is a statistically significant relationship between F:N and BMI at the 90% confidence level.

The R-Squared statistic indicates that the model as fitted explains 2,99933% of the variability in F:N. The correlation coefficient equals 0,173186, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 5,35515. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 2,30273 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.1.4.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Linear	0,6792	46,13%
Square root-Y	0,591	43,45%
Square root-X	0,6563	43,07%
Exponential	0,6381	40,72%
Logarithmic-X	0,6321	39,96%
Reciprocal-Y	-0,5938	35,26%
Multiplicative	0,5900	34,80%
Reciprocal-X	-0,5816	33,82%
S-curve	-0,5389	29,04%
Double reciprocal	0,4929	24,30%
Logistic	<no fit>	
Log probit	<no fit>	

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the linear model yields the highest R-Squared value with 46,1324%. This is the currently selected model.

1.1.1.4.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 1,95

Median of sample 2: 2,6

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 19,0208

Average rank of sample 2: 23,7941

W = 251,5   P-value = 0,212951

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,245098
Two-sided large sample K-S statistic = 0,773175
Approximate P value = 0,588335

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,245098, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.1.4.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	134,623	3	44,8745	1,55	0,2049

Within groups	3413,1	118	28,9245
Total (Corr.)	3547,72	121	

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 1,55143, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

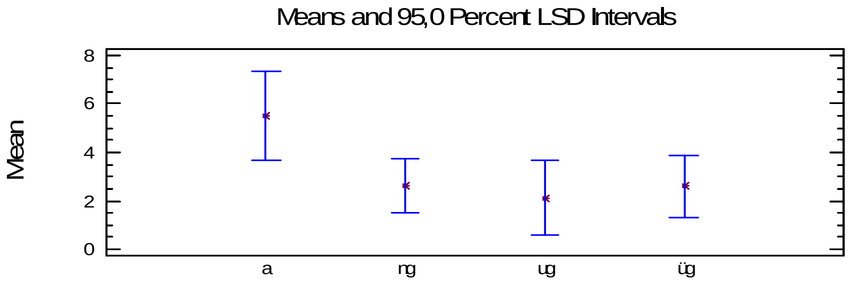
	Count	Mean	Homogeneous Groups
ug	24	2,12917	X
ng	46	2,61304	X
üg	35	2,62	X
a	17	5,48824	X

Contrast	Difference	+/- Limits
a - ng	2,87519	3,02291
a - ug	3,35907	3,37614
a - üg	2,86824	3,14849
ng - ug	0,483877	2,68178
ng - üg	-0,00695652	2,38885
ug - üg	-0,490833	2,82257

* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.1.4.7 Paarweiser Vergleich (Adipös vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 2,0

Median of sample 2: 2,6

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

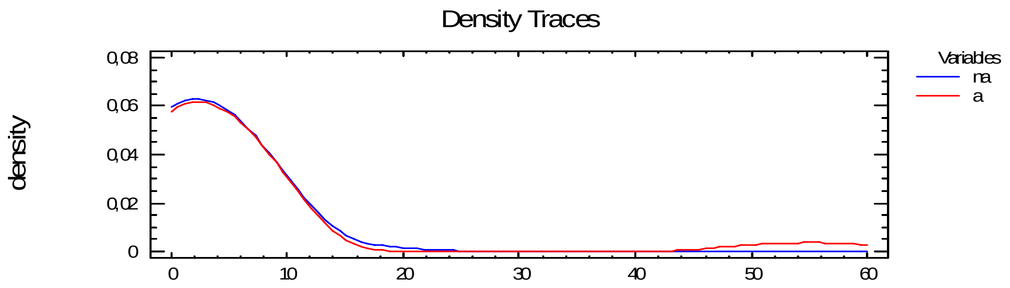
Average rank of sample 1: 60,019

Average rank of sample 2: 70,6471

W = 1048,0   P-value = 0,251494

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.



ANOVA Table

Analysis of Variance

Source   Sum of Squares   Df Mean Square   F-Ratio   P-Value

Between groups	130,234	1	130,234	4,57	0,0345
Within groups	3417,49	120	28,479		

Total (Corr.)	3547,72	121

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 4,57296, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is less than 0,05, there is a statistically significant difference between the means of the 2 variables at the 95,0% confidence level. To determine which means are significantly different from which others, select Multiple Range Tests from the list of Tabular Options.

1.1.1.4.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

Alter
Banane
BMI
EGew
EWeise
F:N
Händer

Hunger
Krankh
Schoko
Status

Data input: observations
Number of complete cases: 122
Missing value treatment: listwise
Standardized: yes

Number of components extracted: 5

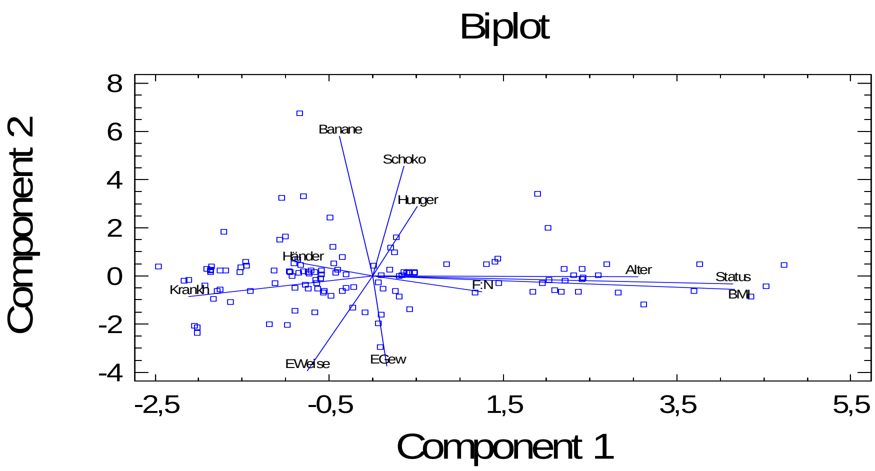
Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,52747	22,977	22,977
2	1,41919	12,902	35,879
3	1,29462	11,769	47,648
4	1,16329	10,575	58,223
5	1,05348	9,577	67,800
6	0,926747	8,425	76,225
7	0,81604	7,419	83,644
8	0,698947	6,354	89,998
9	0,571376	5,194	95,192
10	0,457624	4,160	99,352
11	0,0712262	0,648	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 11 variables which account for most of the variability in the data. In this case, 5 components have been extracted, since 2090115364 components had eigenvalues greater than or

equal to 1,0. Together they account for 67,8004% of the variability in the original data.



1.1.1.5 Schnitzel mit Pommes und Salat

1.1.1.5.1 Prüfung auf Normalverteilung

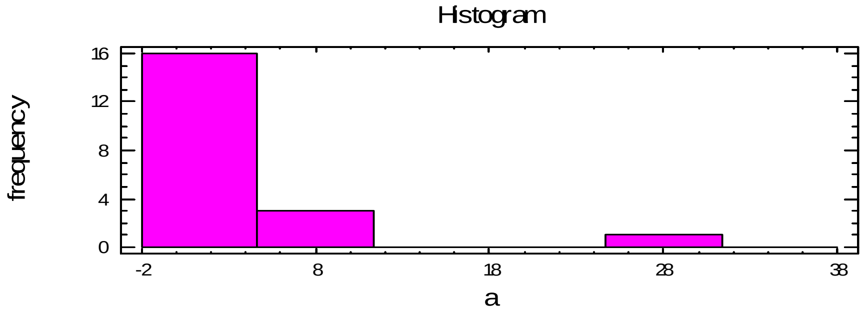
Tabelle 5: Fett – Nichtfett –Verhältnis - First Fixation [s] der vier Gruppen - Schnitzel mit Pommes und Salat

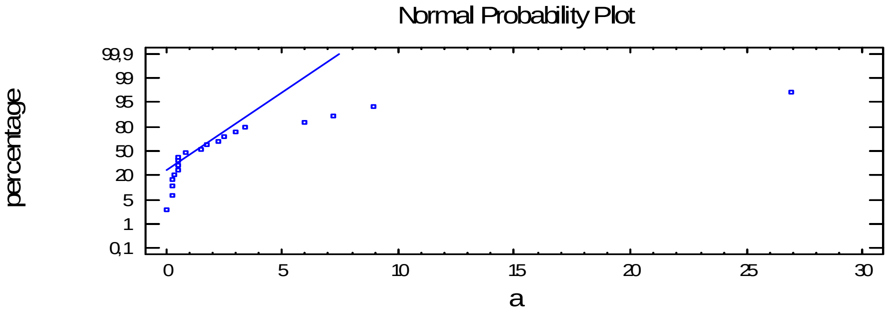
ug	ng	üg	a
1,9	0,3	0,7	3,0
6,4	5,8	0,3	
3,1	4,1	1,0	0,0
0,4	1,0	2,6	2,5
2,2	2,0	2,1	0,3
1,0	0,8	1,9	0,5
0,8	0,9	2,6	0,5
1,2	0,3	0,6	3,4
3,0	1,0	2,9	0,3
1,0	4,2	2,5	8,9
3,4	2,2	2,2	0,4
2,7		2,5	0,9
0,6	11,7	0,7	0,5
0,4	0,5	2,1	0,5

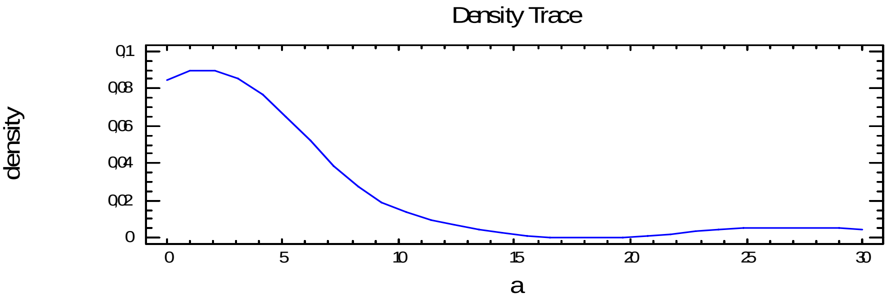
3,2	0,5	14,6	0,3
0,5	1,7	7,9	1,5
0,4	2,7	0,7	6,0
3,9	0,6	12,4	7,2
0,8	0,5	0,9	26,9
4,2	2,4	13,1	2,3
1,0	0,6	0,5	1,8
0,4	0,6	4,7	
0,7	2,8	1,1	
	2,4	12,1	
	1,0	2,8	
	0,4	2,4	
	3,8	2,3	
	0,5	0,8	
	0,4	0,8	
	14,7	5,0	
	0,4	0,4	
	14,6	0,4	
	9,6	4,9	
	1,1	0,7	
	0,3	4,0	
		0,4	
	0,2	0,7	
	1,0	4,1	
	2,6	0,3	
	5,8		
	0,3		
	0,0		
	4,6		

	3,4		
	0,4		
	2,6		
	0,6		
	0,1		
	0,5		

Die Gruppe der Untergewichtigen (ug) wird mit der Gruppe der Adipösen (a) verglichen.







Summary Statistics for a

Count = 20

Average = 3,385

Variance = 36,9119

Standard deviation = 6,07551

Minimum = 0,0

Maximum = 26,9

Range = 26,9

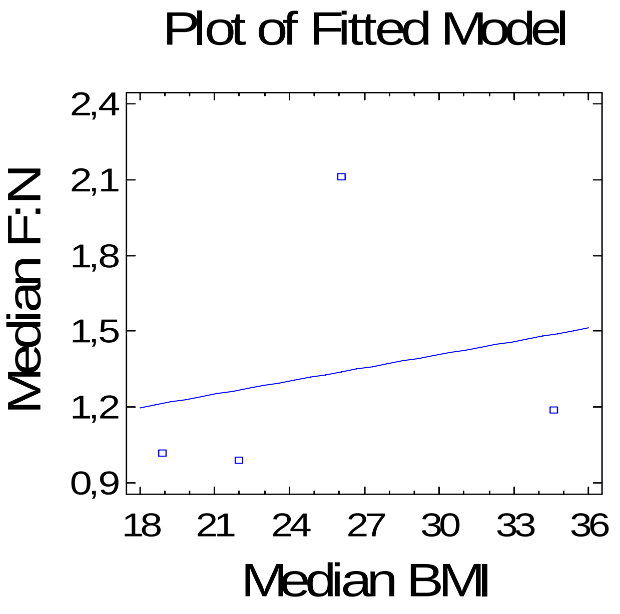
Stnd. skewness = 6,17321

Stnd. kurtosis = 11,665

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

1.1.1.5.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N
Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	0,883448	1,39662	0,632561	0,5917
Slope	0,0174824	0,0535621	0,326394	0,7751

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,0424647	1	0,0424647	0,11	0,7751
Residual	0,79721	2	0,398605		
Total (Corr.)	0,839675	3			

Correlation Coefficient = 0,224884
R-squared = 5,05727 percent
R-squared (adjusted for d.f.) = -42,4141 percent
Standard Error of Est. = 0,631352
Mean absolute error = 0,385131
Durbin-Watson statistic = 2,8198 (P=0,0034)
Lag 1 residual autocorrelation = -0,489296

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

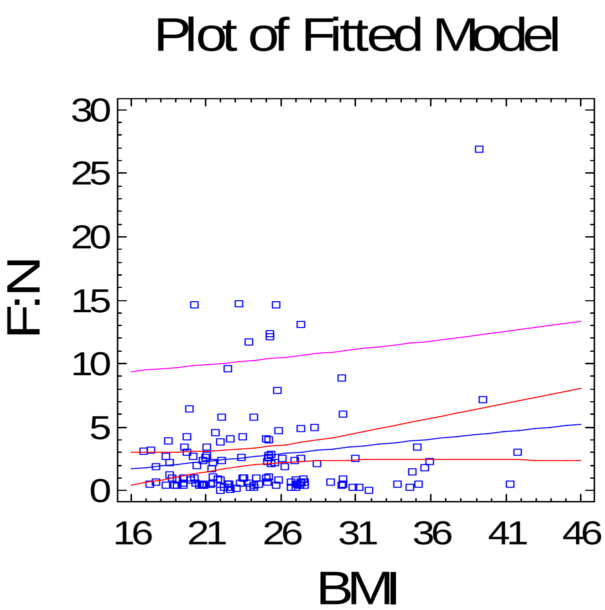
Median F:N = 0,883448 + 0,0174824*Median BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between Median F:N and Median BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 5,05727% of the variability in Median F:N. The correlation coefficient equals 0,224884, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,631352. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,385131 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation. Plot the residuals versus row order to see if there is any pattern which can be seen.

1.1.1.5.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	-0,172998	1,65547	-0,104501	0,9169
Slope	0,117554	0,0656461	1,79072	0,0757

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	46,9457	1	46,9457	3,21	0,0757
Residual	1859,28	127	14,64		
Total (Corr.)	1906,23	128			

Correlation Coefficient = 0,156932

R-squared = 2,46275 percent

R-squared (adjusted for d.f.) = 1,69474 percent

Standard Error of Est. = 3,82623

Mean absolute error = 2,44651

Durbin-Watson statistic = 2,00478 (P=0,4892)

Lag 1 residual autocorrelation = -0,00518127

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = -0,172998 + 0,117554*BMI

Since the P-value in the ANOVA table is less than 0.10, there is a statistically significant relationship between F:N and BMI at the 90% confidence level.

The R-Squared statistic indicates that the model as fitted explains 2,46275% of the variability in F:N. The correlation coefficient equals 0,156932, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 3,82623. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 2,44651 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.1.5.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Double reciprocal	0,4535	20,57%
S-curve	-0,3963	15,70%
Reciprocal-Y	-0,3469	12,04%
Reciprocal-X	-0,3448	11,89%
Multiplicative	0,3419	11,69%
Logarithmic-X	0,2872	8,25%
Exponential	0,2822	7,96%
Square root-X	0,2563	6,57%
Square root-Y	0,2524	6,37%
Linear	0,2249	5,06%
Logistic	<no fit>	
Log probit	<no fit>	

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the double reciprocal model yields the highest R-Squared value with 20,5661%. This is 15,5088% higher than the currently selected linear model. To change models, select the Analysis Options dialog box.

1.1.1.5.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 1,0

Median of sample 2: 1,2

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 22,7826

Average rank of sample 2: 21,1

W = 212,0   P-value = 0,669424

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,276087

Two-sided large sample K-S statistic = 0,903006

Approximate P value = 0,392999

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,276087, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.1.5.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	34,0678	3	11,3559	0,76	0,5196
Within groups	1872,16	125	14,9773		
Total (Corr.)	1906,23	128			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,75821, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

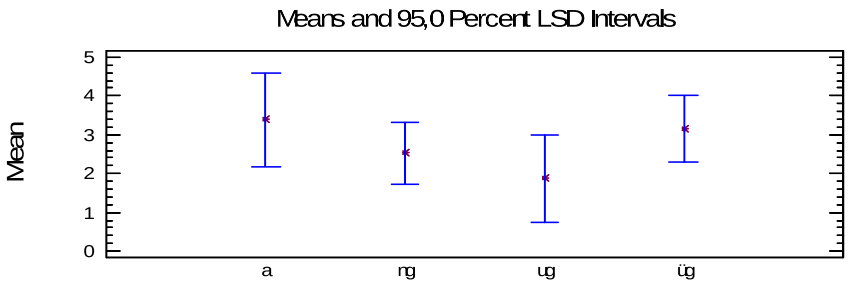
	Count	Mean	Homogeneous Groups
ug	23	1,87826	X
ng	47	2,52128	X
üg	39	3,14615	X
a	20	3,385	X

Contrast	Difference	+/- Limits
a - ng	0,863723	2,04486
a - ug	1,50674	2,34178
a - üg	0,238846	2,10654
ng - ug	0,643016	1,94907
ng - üg	-0,624877	1,65905
ug - üg	-1,26789	2,01368

* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.1.5.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 1,1

Median of sample 2: 1,2

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 65,8257

Average rank of sample 2: 60,5

W = 1000,0   P-value = 0,559839

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the

average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	10,1717	1	10,1717	0,68	0,4107
Within groups	1896,06	127	14,9296		
Total (Corr.)	1906,23	128			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,681314, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 2 variables at the 95,0% confidence level.

1.1.1.5.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

- Alter
- BMI
- EGew
- EWeise
- F:N
- Händer
- Hunger
- Krankh
- Pommes
- Salat
- Schnitzel
- Status

Data input: observations

Number of complete cases: 112

Missing value treatment: listwise

Standardized: yes

Number of components extracted: 5

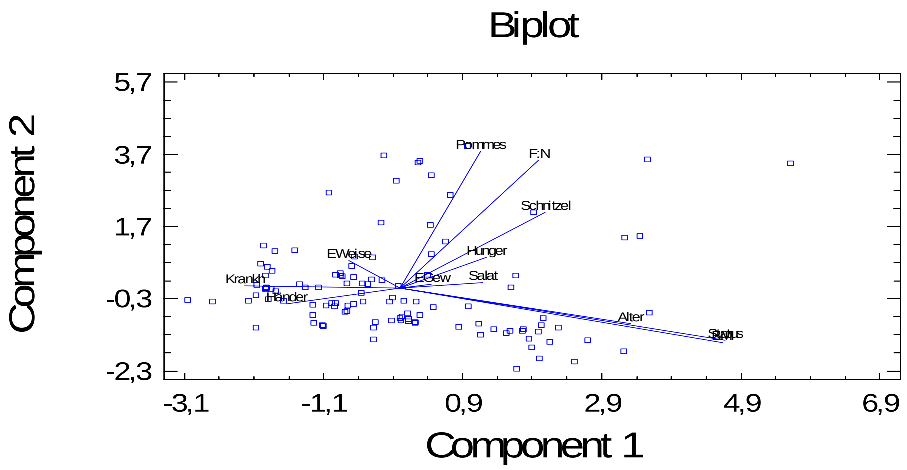
Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,50251	20,854	20,854
2	1,77035	14,753	35,607
3	1,57097	13,091	48,699
4	1,18363	9,864	58,562
5	1,05384	8,782	67,344
6	0,974182	8,118	75,462
7	0,972214	8,102	83,564
8	0,760274	6,336	89,900

9	0,537022	4,475	94,375
10	0,467861	3,899	98,274
11	0,126167	1,051	99,325
12	0,0809892	0,675	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 12 variables which account for most of the variability in the data. In this case, 5 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 67,3441% of the variability in the original data.



1.1.2 Fixation Length

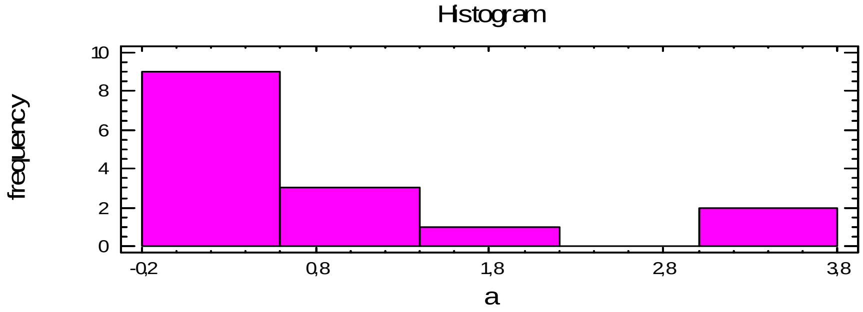
1.1.2.1 Hamburger und Birne

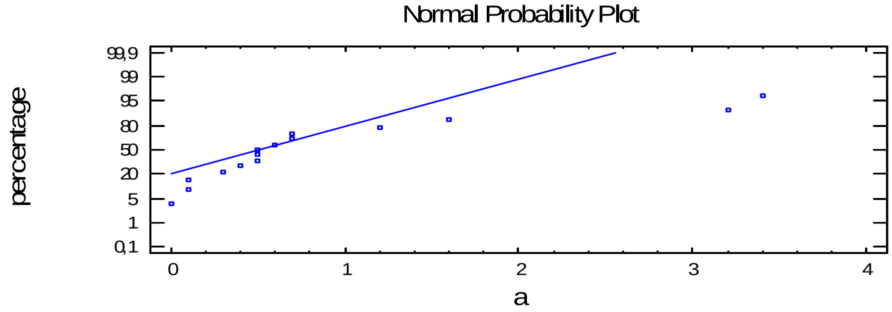
1.1.2.1.1 Prüfung auf Normalverteilung

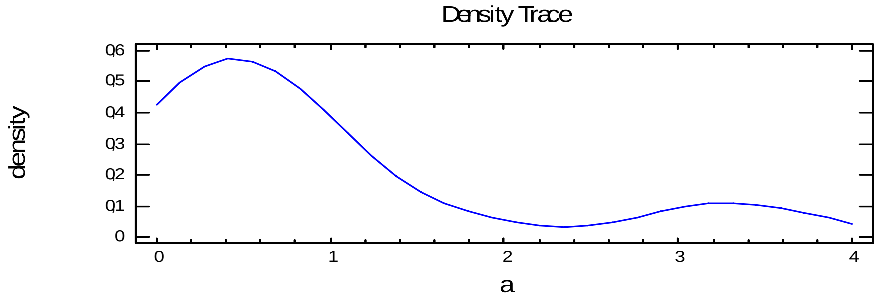
Tabelle 6: Fett – Nichtfett –Verhältnis - Fixation Length [s] der vier Gruppen - Hamburger und Birne

Ug F:N	Ng F:N	Üg F:N	A F:N
0,0	0,3	0,1	0,1
0,2	0,1	0,0	0,7
0,0	0,7	0,2	0,0
1,1	0,1	0,2	3,2
0,0	0,4	0,4	0,1
0,3	0,0	0,0	0,1
0,5	0,0	2,0	0,5
0,0	0,3	0,1	0,0
0,0	0,3	0,0	0,3
0,1	0,2	0,0	3,4
0,1	0,0	1,7	0,0
0,1	0,1	0,3	0,7
0,1	0,2	0,6	0,6
0,4	0,6	0,3	0,5
0,3	0,1	0,6	1,6
0,0	1,6	0,3	0,2
0,2	0,2	0,0	0,1
0,1	0,9	0,2	1,2
0,2	0,0	0,0	0,3
0,5	2,0	0,3	
0,1	0,2	0,4	0,5
0,2	0,2	1,2	0,4
	0,0	0,1	
	0,4	1,5	

	0,3	0,7	
	0,8	1,5	
	1,1	0,0	
	0,6	0,4	
	0,2	0,0	
	0,0	0,1	
	5,0	3,9	
	0,1	0,1	
	1,2	0,2	
	0,2	1,6	
	0,0	0,3	
	0,3	0,1	
	0,2	0,3	
	0,4	1,0	
	1,2	0,0	
	13,3		
	4,2		
	2,1		
	0,3		
	2,1		
	0,1		
	0,3		
	0,4		
	1,3		







Summary Statistics for a

Count = 15

Average = 0,92

Variance = 1,10457

Standard deviation = 1,05099

Minimum = 0,0

Maximum = 3,4

Range = 3,4

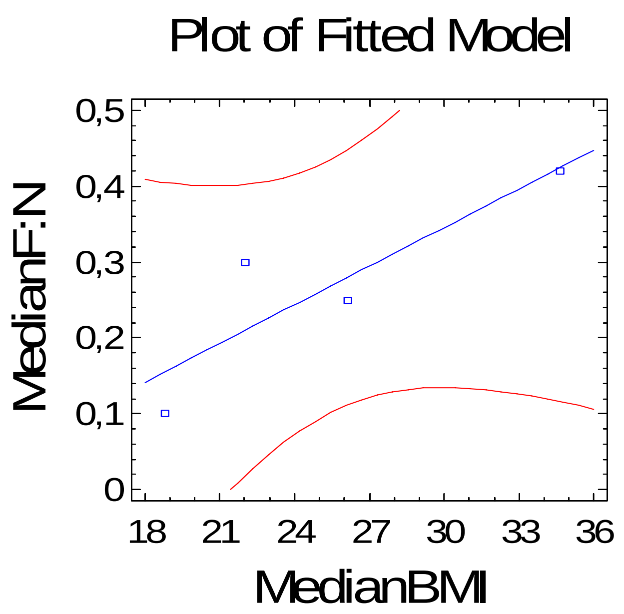
Stnd. skewness = 2,79567

Stnd. kurtosis = 1,79238

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is within the range expected for data from a normal distribution.

1.1.2.1.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: MedianF:N

Independent variable: MedianBMI

		Standard	T	
Parameter	Estimate	Error	Statistic	P-Value

Intercept	-0,163969	0,170337	-0,962616	0,4373
Slope	0,016982	0,00652834	2,60127	0,1214

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,0406578	1	0,0406578	6,77	0,1214
Residual	0,0120172	2	0,00600861		
Total (Corr.)	0,052675	3			

Correlation Coefficient = 0,878556

R-squared = 77,1861 percent

R-squared (adjusted for d.f.) = 65,7791 percent

Standard Error of Est. = 0,0775153

Mean absolute error = 0,0448434

Durbin-Watson statistic = 2,98912 (P=0,0010)

Lag 1 residual autocorrelation = -0,623434

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between MedianF:N and MedianBMI. The equation of the fitted model is

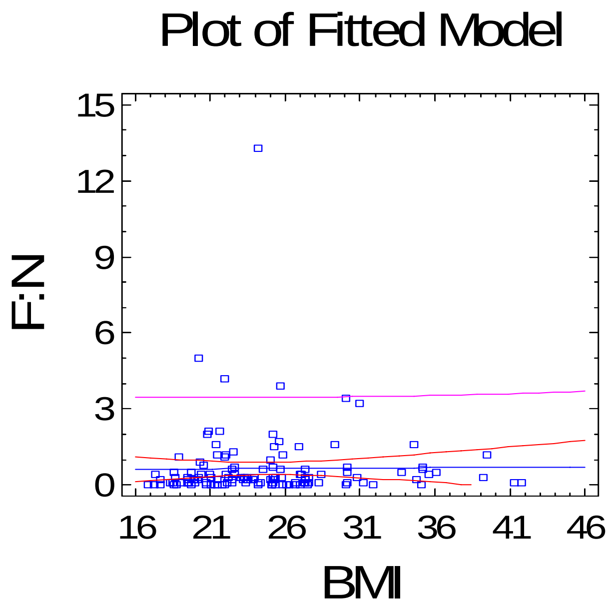
MedianF:N = -0,163969 + 0,016982*MedianBMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between MedianF:N and MedianBMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 77,1861% of the variability in MedianF:N. The correlation coefficient equals 0,878556, indicating a moderately strong relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,0775153. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,0448434 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation. Plot the residuals versus row order to see if there is any pattern which can be seen.

1.1.2.1.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Standard T

Parameter	Estimate	Error	Statistic	P-Value
Intercept	0,57374	0,606025	0,946726	0,3456
Slope	0,00301332	0,0239242	0,125953	0,9000

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,0315959	1	0,0315959	0,02	0,9000
Residual	254,933	128	1,99166		
Total (Corr.)	254,965	129			

Correlation Coefficient = 0,0111321

R-squared = 0,0123923 percent

R-squared (adjusted for d.f.) = -0,768761 percent

Standard Error of Est. = 1,41126

Mean absolute error = 0,692464

Durbin-Watson statistic = 1,75831 (P=0,0846)

Lag 1 residual autocorrelation = 0,120455

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 0,57374 + 0,00301332*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 0,0123923% of the variability in F:N. The correlation coefficient equals 0,0111321, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 1,41126. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,692464 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.2.1.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model   Correlation   R-Squared

Reciprocal-X	-0,8994	80,90%
Logarithmic-X	0,8911	79,40%
Square root-X	0,8853	78,37%
Linear	0,8786	77,19%
S-curve	-0,8689	75,51%
Log probit	0,8687	75,47%
Square root-Y	0,8474	71,80%
Multiplicative	0,8413	70,77%
Logistic	0,8362	69,92%
Double reciprocal	0,8243	67,95%
Exponential	0,8105	65,69%
Reciprocal-Y	-0,7383	54,52%

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the reciprocal-X model yields the highest R-Squared value with 80,9006%. This is 3,71453% higher than the currently selected linear model. To change models, select the Analysis Options dialog box.

1.1.2.1.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 0,1

Median of sample 2: 0,4

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

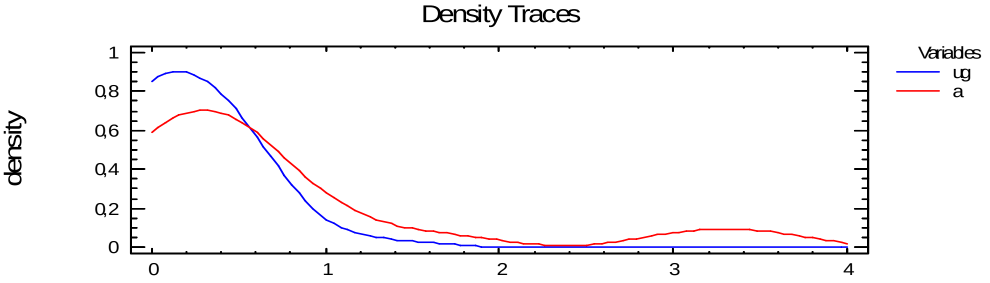
Average rank of sample 1: 17,8409

Average rank of sample 2: 26,3571

W = 322,5   P-value = 0,025113

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is less than 0,05, there is a statistically significant difference between the medians at the 95,0% confidence level.



Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,437229

Two-sided large sample K-S statistic = 1,43316

Approximate P value = 0,0328838

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,437229, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is less than 0,05, there is a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.2.1.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	8,69481	3	2,89827	1,48	0,2224
Within groups	246,27	126	1,95452		
Total (Corr.)	254,965	129			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 1,48285, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

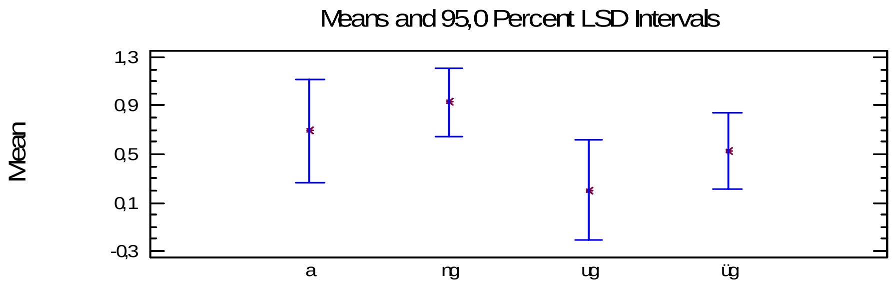
	Count	Mean	Homogeneous Groups
ug	22	0,204545	X
üg	39	0,530769	XX
a	21	0,690476	XX
ng	48	0,929167	X

Contrast	Difference	+/- Limits
a - ng	-0,23869	0,72386
a - ug	0,485931	0,844061
a - üg	0,159707	0,748849
ng - ug	*0,724621	0,712324
ng - üg	0,398397	0,596441
ug - üg	-0,326224	0,737703

* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. An asterisk has been placed next to 1 pair, indicating that this pair shows a statistically significant difference at the 95,0% confidence level. At the top of the page, 2 homogenous groups are identified using columns of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.2.1.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 0,2

Median of sample 2: 0,4

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 64,0321

Average rank of sample 2: 73,119

W = 1304,5   P-value = 0,308846

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the

average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	0,0442117	1	0,0442117	0,02	0,8818
Within groups	254,92	128	1,99157		
Total (Corr.)	254,965	129			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,0221995, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 2 variables at the 95,0% confidence level.

1.1.2.1.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

- Alter
- BMI
- EGew
- EWeise
- Fett
- Fett:Nichtfett
- Hamb
- Hamb:Birne
- Händer
- Hunger
- Krankh
- NF
- Status

Data input: observations

Number of complete cases: 129

Missing value treatment: listwise

Standardized: yes

Number of components extracted: 5

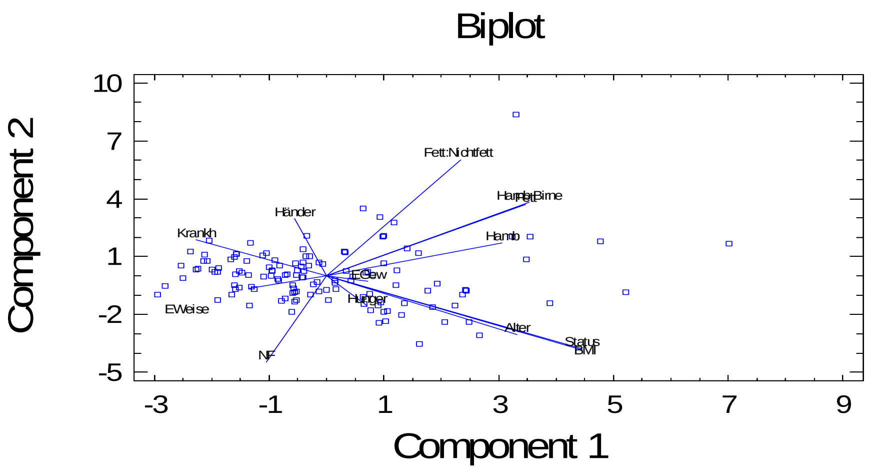
Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,9443	22,648	22,648
2	2,07255	15,943	38,591
3	1,4515	11,165	49,757
4	1,19984	9,230	58,986
5	1,01313	7,793	66,779
6	0,992676	7,636	74,415
7	0,889453	6,842	81,257

8	0,796228	6,125	87,382
9	0,553799	4,260	91,642
10	0,45838	3,526	95,168
11	0,37517	2,886	98,054
12	0,1754	1,350	99,404
13	0,07747	0,596	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 13 variables which account for most of the variability in the data. In this case, 5 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 66,7795% of the variability in the original data.



1.1.2.2 Praline und Erdbeere

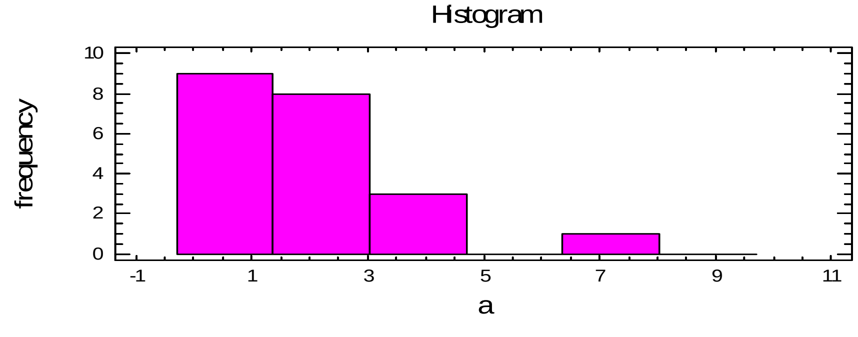
1.1.2.2.1 Prüfung auf Normalverteilung

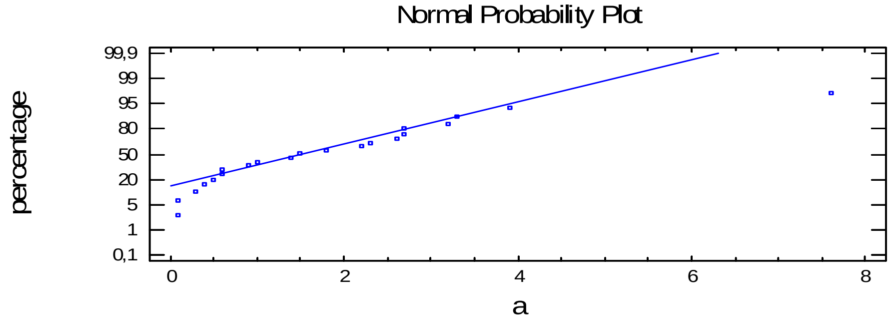
Tabelle 7: Fett – Nichtfett –Verhältnis - Fixation Length [s] der vier Gruppen - Praline und Erdbeere

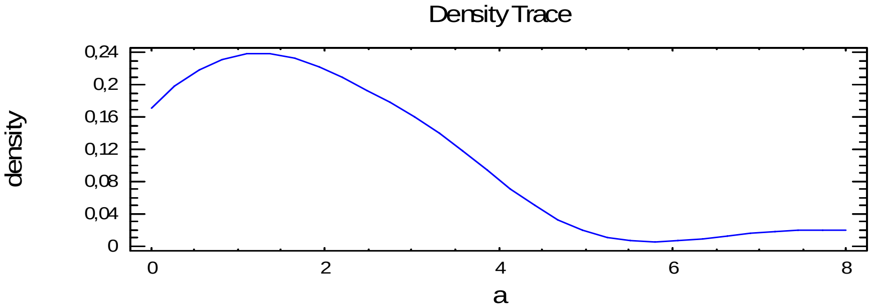
ug	ng	üg	a
2,3	0,8	2,6	1,8
0,3	1,8	0,8	0,6
1,1	1,7	2,8	1,5

0,7	2,1	1,1	0,3
2,1	1,5	3,6	2,2
2,3	1,2	0,7	3,3
0,9	1,0	2,0	1,4
0,8	2,7	2,5	2,6
0,9	1,8	1,6	3,2
1,0	0,7	1,1	2,7
3,6	0,7	1,1	2,3
1,4	1,5	2,7	0,9
0,5	3,2	1,3	7,6
0,4	1,3	0,7	1,0
1,1	1,4	1,0	2,7
2,1	0,4	2,3	0,4
0,5	4,6	0,2	0,6
0,3	2,7	1,1	0,1
0,4	0,6	2,0	0,1
2,7	3,7	1,2	3,9
1,6	2,1	0,6	0,5
0,6	1,0	1,4	
1,7	1,0	1,2	
	2,2	0,9	
	0,5	0,8	
	1,3	4,4	
	0,5	0,7	
	1,8	2,4	
	1,3	1,0	
	1,1	0,7	
	0,9	1,4	
	0,7	0,8	

	0,3	0,2	
	0,6	0,5	
	1,0	1,1	
	1,2	0,5	
	4,6	0,3	
	0,8	1,8	
	1,4	1,6	
	0,6		
	1,3		
	0,9		
	2,2		
	3,1		
	1,2		
	1,7		
	1,1		
	0,9		
	1,3		







Summary Statistics for a

Count = 21

Average = 1,89048

Variance = 3,0509

Standard deviation = 1,74668

Minimum = 0,1

Maximum = 7,6

Range = 7,5

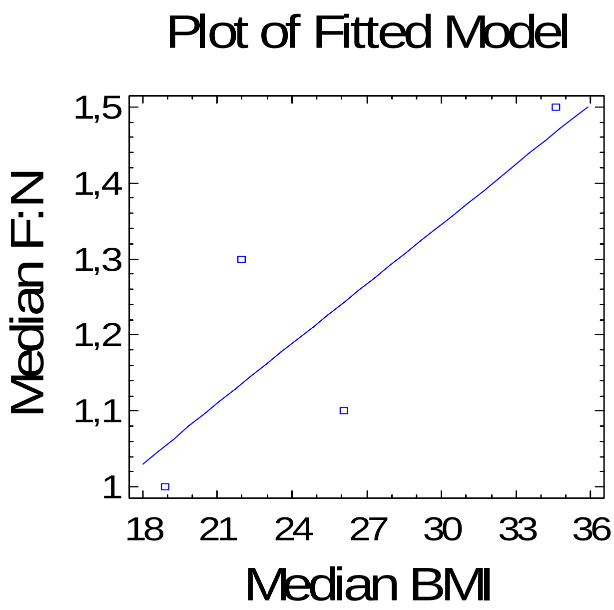
Stnd. skewness = 3,35918

Stnd. kurtosis = 4,38719

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

1.1.2.2.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N

Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	0,557734	0,355364	1,56947	0,2571
Slope	0,0262703	0,0136286	1,92758	0,1937

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,0958867	1	0,0958867	3,72	0,1937
Residual	0,0516133	2	0,0258066		
Total (Corr.)	0,1475	3			

Correlation Coefficient = 0,806275

R-squared = 65,0079 percent

R-squared (adjusted for d.f.) = 47,5119 percent
Standard Error of Est. = 0,160644
Mean absolute error = 0,098816
Durbin-Watson statistic = 3,36498 (P=0,0000)
Lag 1 residual autocorrelation = -0,721741

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

Median F:N = 0,557734 + 0,0262703*Median BMI

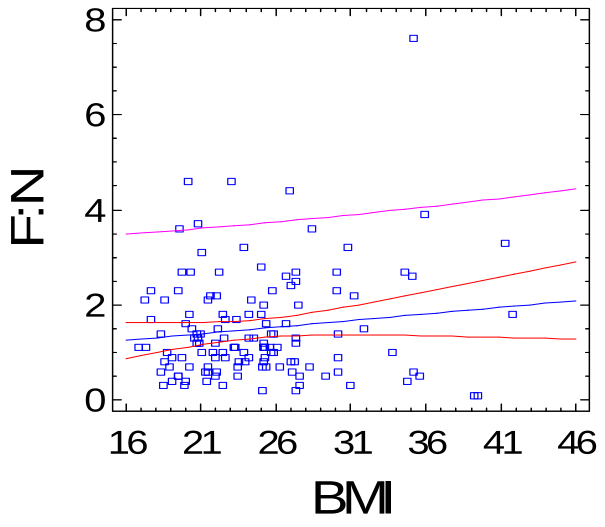
Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between Median F:N and Median BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 65,0079% of the variability in Median F:N. The correlation coefficient equals 0,806275, indicating a moderately strong relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,160644. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,098816 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation. Plot the residuals versus row order to see if there is any pattern which can be seen.

1.1.2.2.3 Prüfung auf Linearität

Plot of Fitted Model



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	0,807088	0,473102	1,70595	0,0904
Slope	0,0279381	0,0187328	1,4914	0,1383

Analysis of Variance

Source Sum of Squares Df Mean Square F-Ratio P-Value

Model	2,75459	1	2,75459	2,22	0,1383
Residual	160,995	130	1,23842		
Total (Corr.)	163,749	131			

Correlation Coefficient = 0,1297

R-squared = 1,6822 percent

R-squared (adjusted for d.f.) = 0,925909 percent

Standard Error of Est. = 1,11284

Mean absolute error = 0,820859

Durbin-Watson statistic = 1,82059 (P=0,1522)

Lag 1 residual autocorrelation = 0,0830248

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 0,807088 + 0,0279381*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 1,6822% of the variability in F:N. The correlation coefficient equals

0,1297, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 1,11284. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,820859 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.2.2.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Linear	0,8063	65,01%
Square root-X	0,8017	64,27%
Square root-Y	0,7994	63,90%
Logarithmic-X	0,7963	63,41%
Exponential	0,7924	62,79%
Multiplicative	0,7867	61,89%
Reciprocal-X	-0,7834	61,37%
S-curve	-0,7784	60,59%
Reciprocal-Y	-0,7783	60,58%
Double reciprocal	0,7734	59,82%
Logistic	<no fit>	
Log probit	<no fit>	

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the linear model yields the highest R-Squared value with 65,0079%. This is the currently selected model.

1.1.2.2.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 1,0

Median of sample 2: 1,5

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 20,6957

Average rank of sample 2: 24,4762

W = 283,0   P-value = 0,334796

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the

average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,293996
Two-sided large sample K-S statistic = 0,974066
Approximate P value = 0,300358

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,293996, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.2.2.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	4,75223	3	1,58408	1,28	0,2857
Within groups	158,997	128	1,24216		

Total (Corr.)   163,749   131

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 1,27526, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

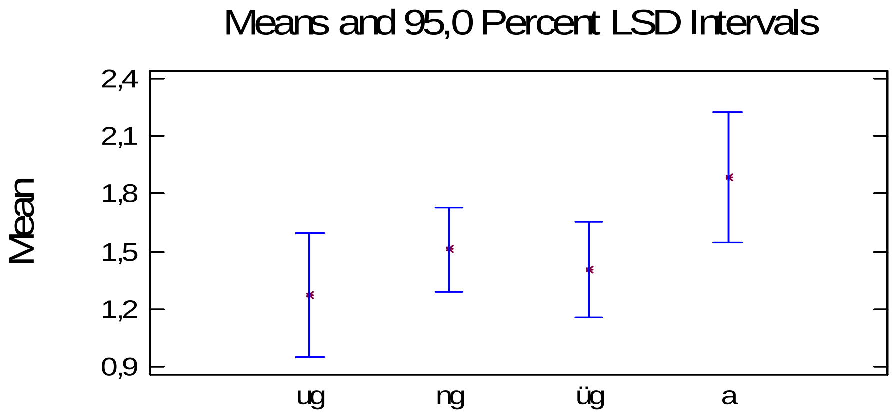
	Count	Mean	Homogeneous Groups
ug	23	1,27391	X
üg	39	1,40256	X
ng	49	1,5102	X
a	21	1,89048	X

Contrast	Difference	+/- Limits
ug - ng	-0,236291	0,557402
ug - üg	-0,128651	0,579781
ug - a	-0,616563	0,665605
ng - üg	0,10764	0,473233
ng - a	-0,380272	0,575182
üg - a	-0,487912	0,596895

----
* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.2.2.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 1,1

Median of sample 2: 1,5

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

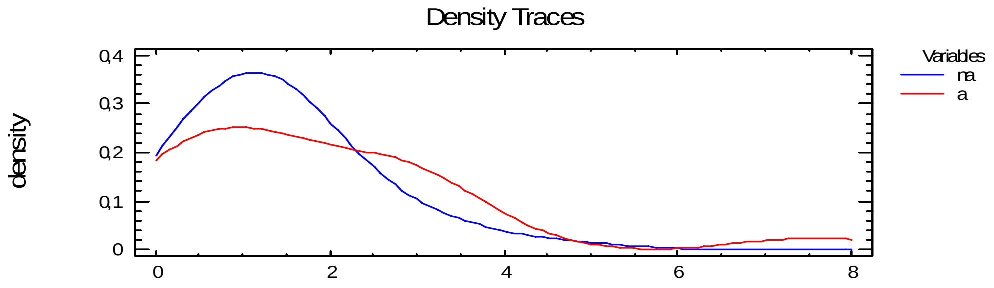
Average rank of sample 1: 65,5225

Average rank of sample 2: 71,6667

W = 1274,0   P-value = 0,501236

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.



ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	3,85212	1	3,85212	3,13	0,0791
Within groups	159,897	130	1,22998		
Total (Corr.)	163,749	131			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 3,13186, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 2 variables at the 95,0% confidence level.

1.1.2.2.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

Alter
BMI
EGew
EWeise
F
F:N
Händer

Hunger
Krankh
N
Status

Data input: observations
Number of complete cases: 132
Missing value treatment: listwise
Standardized: yes

Number of components extracted: 5

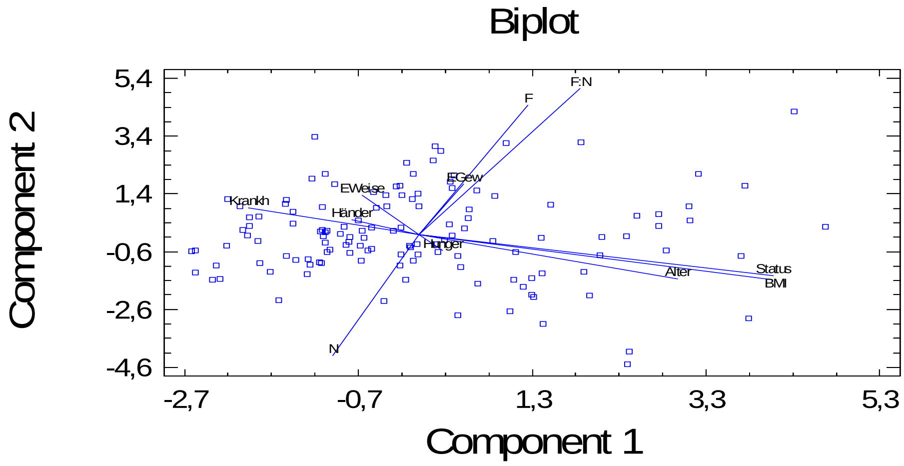
Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,51966	22,906	22,906
2	2,18595	19,872	42,778
3	1,19035	10,821	53,600
4	1,12826	10,257	63,857
5	1,01963	9,269	73,126
6	0,913069	8,301	81,426
7	0,809763	7,361	88,788
8	0,584108	5,310	94,098
9	0,417291	3,794	97,892
10	0,154698	1,406	99,298
11	0,077227	0,702	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 11 variables which account for most of the variability in the data. In this case, 5 components have been extracted, since 2090115364 components had eigenvalues greater than or

equal to 1,0. Together they account for 73,1259% of the variability in the original data.



1.1.2.3 Chips und Weintrauben

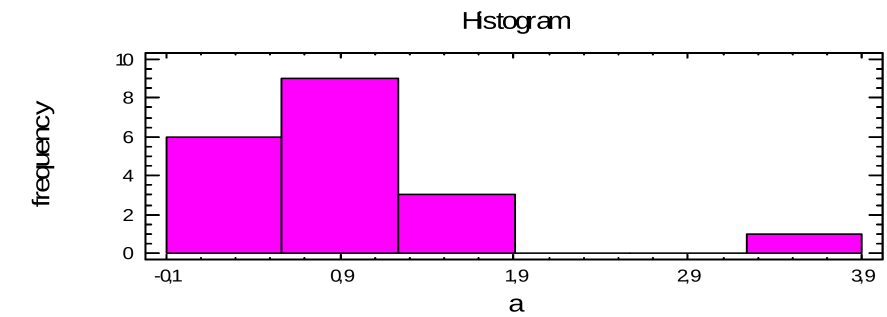
1.1.2.3.1 Prüfung auf Normalverteilung

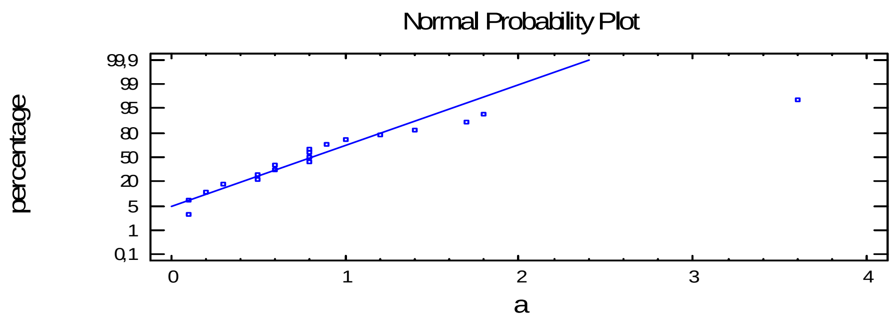
Tabelle 8: Fett – Nichtfett –Verhältnis - Fixation Length [s] der vier Gruppen - Chips und Weintrauben

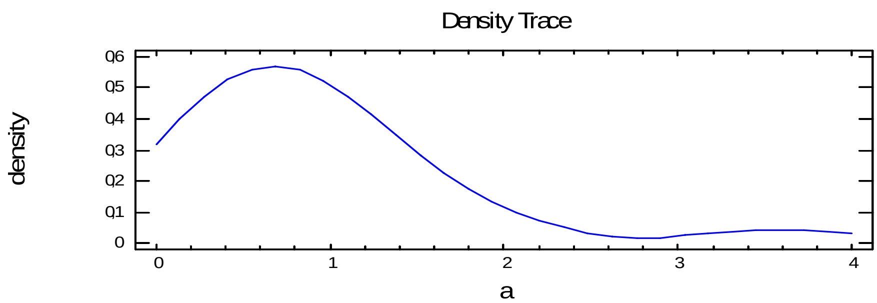
ug	ng	üg	a
1,0	0,5	0,3	3,6
0,3	0,7	1,7	0,5
0,8	0,6	1,2	0,6
0,4	3,2	1,3	0,8
0,2	0,1	1,2	1,4
2,4	0,7	0,4	1,8
0,8	0,7	1,9	0,8
5,3	0,4	4,8	0,8
0,7	1,6	1,0	1,2
1,3	1,2	0,7	0,3
0,8	0,5	1,6	1,7
0,3	0,7	2,4	0,1
1,7	1,5	0,9	0,9
0,1	1,1	0,4	0,6

0,8	1,5	0,8	0,5
1,0	1,7	0,3	0,8
0,8	0,9	0,9	0,2
0,4	5,7	0,7	0,1
1,2	0,8	1,0	1,0
	1,1	0,3	1,8
	0,7	0,6	0,9
	1,0	0,7	
	0,6	0,7	
	0,5	1,0	
	1,2	0,5	
	0,6	0,2	
	0,4	1,2	
	0,0	0,8	
	0,7	0,8	
	0,7	0,3	
	4,5	1,5	
	0,7	2,0	
	1,5	0,8	
	0,7	0,5	
	0,6	0,6	
	0,6	0,5	
	1,1	0,6	
	1,2	1,4	
	0,5	1,3	
	0,6		
	0,6		
	1,4		
	0,0		

	0,3		
	1,4		
	1,2		
	3,0		
	1,2		
	2,1		
	0,7		
	1,8		







Summary Statistics for a

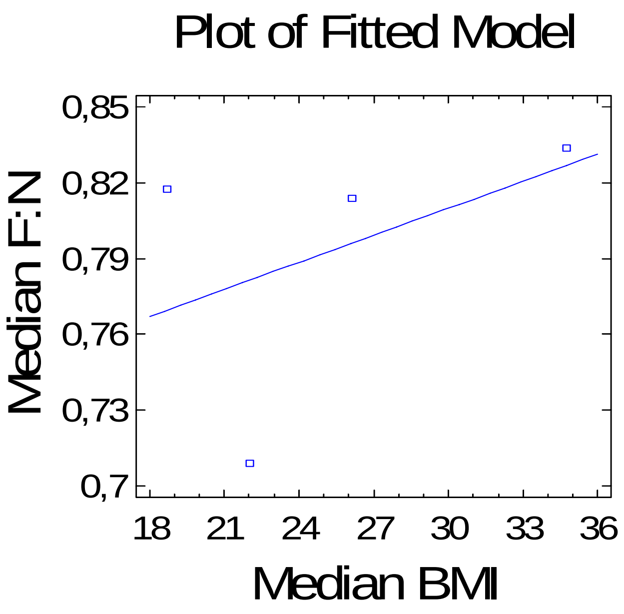
Count = 19

Average = 0,931579
Variance = 0,652281
Standard deviation = 0,807639
Minimum = 0,1
Maximum = 3,6
Range = 3,5
Stnd. skewness = 3,81624
Stnd. kurtosis = 5,45021

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

1.1.2.3.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N

Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	0,702868	0,136719	5,14096	0,0358
Slope	0,00356651	0,00523902	0,680758	0,5663

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,00182294	1	0,00182294	0,46	0,5663
Residual	0,00786713	2	0,00393357		
Total (Corr.)	0,00969007	3			

Correlation Coefficient = 0,433733

R-squared = 18,8124 percent

R-squared (adjusted for d.f.) = -21,7814 percent
Standard Error of Est. = 0,0627182
Mean absolute error = 0,0361302
Durbin-Watson statistic = 2,87617 (P=0,0022)
Lag 1 residual autocorrelation = -0,586391

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

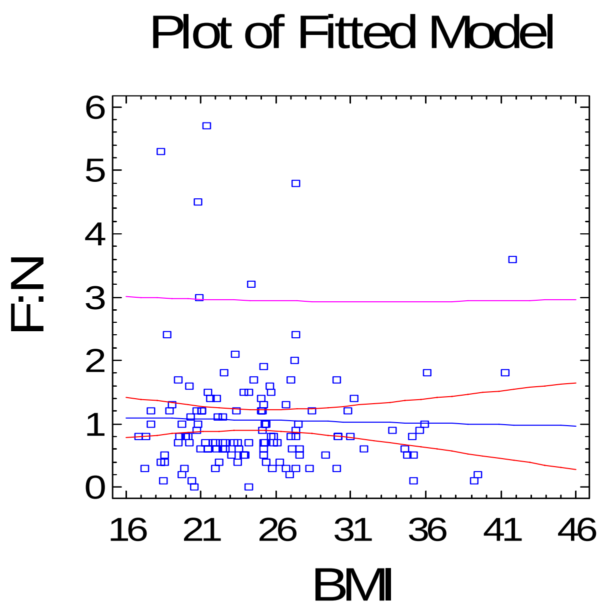
Median F:N = 0,702868 + 0,00356651*Median BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between Median F:N and Median BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 18,8124% of the variability in Median F:N. The correlation coefficient equals 0,433733, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,0627182. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,0361302 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation. Plot the residuals versus row order to see if there is any pattern which can be seen.

1.1.2.3.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	1,17086	0,404012	2,89809	0,0044
Slope	-0,00446144	0,015909	-0,280435	0,7796

Analysis of Variance

Source Sum of Squares Df Mean Square F-Ratio P-Value

Model	0,0710137	1	0,0710137	0,08	0,7796
Residual	115,581	128	0,902976		

Total (Corr.)	115,652	129

Correlation Coefficient = -0,0247796

R-squared = 0,0614029 percent

R-squared (adjusted for d.f.) = -0,719367 percent

Standard Error of Est. = 0,950251

Mean absolute error = 0,605363

Durbin-Watson statistic = 2,2494 (P=0,0779)

Lag 1 residual autocorrelation = -0,12613

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 1,17086 - 0,00446144*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 0,0614029% of the variability in F:N. The correlation coefficient

equals -0,0247796, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,950251. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,605363 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.2.3.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Logistic	0,4566	20,85%
Linear	0,4337	18,81%
Square root-Y	0,4299	18,48%
Exponential	0,4261	18,16%
Reciprocal-Y	-0,4188	17,54%
Square root-X	0,4154	17,26%
Log probit	0,4115	16,93%
Logarithmic-X	0,3944	15,55%
Multiplicative	0,3872	14,99%
Reciprocal-X	-0,3448	11,89%
S-curve	-0,3380	11,43%
Double reciprocal	0,3316	11,00%

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the logistic model yields the highest R-Squared value with 20,8458%. This is 2,03339% higher than the currently selected linear model. To change models, select the Analysis Options dialog box.

1.1.2.3.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 0,8

Median of sample 2: 0,8

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 20,2895

Average rank of sample 2: 20,6905

W = 203,5 P-value = 0,923974

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the

average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,250627
Two-sided large sample K-S statistic = 0,791559
Approximate P value = 0,557935

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,250627, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.2.3.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	0,432736	3	0,144245	0,16	0,9245
Within groups	115,219	126	0,914439		

Total (Corr.) 115,652 129

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,157742, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

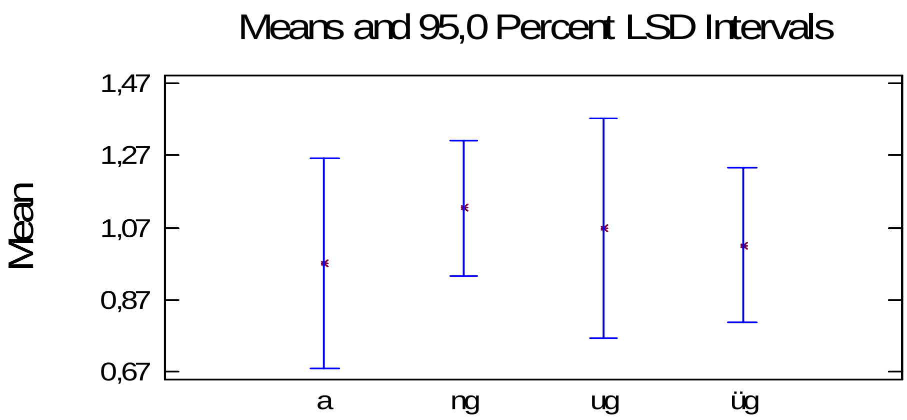
	Count	Mean	Homogeneous Groups
a	21	0,971429	X
üg	39	1,02051	X
ug	19	1,06842	X
ng	51	1,12353	X

Contrast	Difference	+/- Limits
a - ng	-0,152101	0,490669
a - ug	-0,0969925	0,599185
a - üg	-0,0490842	0,512214
ng - ug	0,0551084	0,508633
ng - üg	0,103017	0,402551
ug - üg	0,0479082	0,529447

* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.2.3.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 0,8

Median of sample 2: 0,8

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 65,8807

Average rank of sample 2: 63,5238

W = 1103,0   P-value = 0,794843

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	0,196482	1	0,196482	0,22	0,6415
Within groups	115,456	128	0,901996		
Total (Corr.)	115,652	129			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,217831, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 2 variables at the 95,0% confidence level.

1.1.2.3.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:
    Alter
    BMI
    EGew
    EWeise
    F
    F:N
    Händer
    Hunger
    Krankh
    N
    Status

Data input: observations
Number of complete cases: 130
Missing value treatment: listwise
Standardized: yes

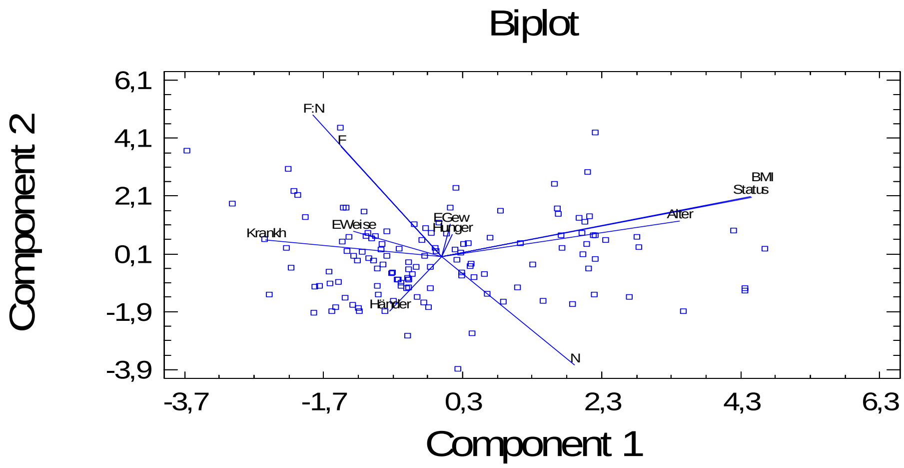
Number of components extracted: 5

Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,57126	23,375	23,375
2	1,87212	17,019	40,394
3	1,20903	10,991	51,385
4	1,11677	10,152	61,538
5	1,01927	9,266	70,804
6	0,910443	8,277	79,081
7	0,779884	7,090	86,171
8	0,681345	6,194	92,365
9	0,503036	4,573	96,938
10	0,250859	2,281	99,218
11	0,0859859	0,782	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 11 variables which account for most of the variability in the data. In this case, 5 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 70,8041% of the variability in the original data.



1.1.2.4 Bananen und Schokolade

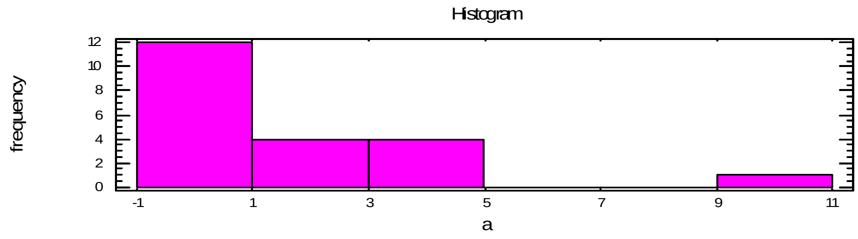
1.1.2.4.1 Prüfung auf Normalverteilung

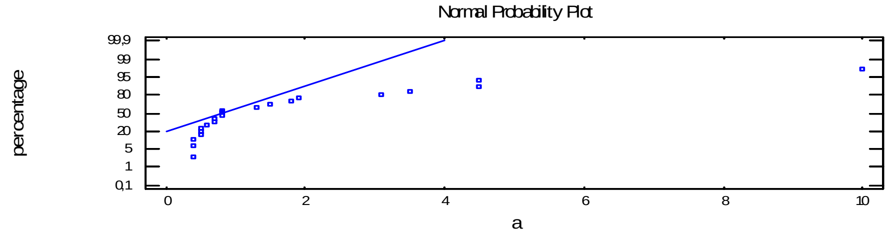
Tabelle 9: Fett – Nichtfett –Verhältnis - Fixation Length [s] der vier Gruppen - Bananen und Schokolade

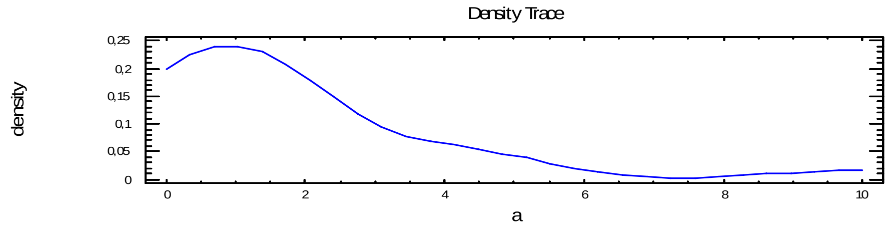
ug	ng	üg	a
0,6	1,9	1,5	0,5
0,9	0,9	1,4	0,8
2,9	1,8	0,2	0,8
0,8	0,3	0,8	1,8
0,2	0,7	1,2	3,1
1,0	1,1	0,7	0,4
1,5	1,6	1,5	1,5
1,9	1,0	0,5	0,6
0,5	0,8	1,0	0,5
1,3	2,8	1,0	0,5
2,6	0,4	0,8	0,4
1,2	0,6	1,7	4,5
0,6	2,9	1,5	0,8
1,2	0,9	0,7	0,7
1,2	0,6	0,2	0,4
0,5	1,1	0,5	1,3

1,3	1,8	1,6	4,5
1,3	1,4	0,2	10,0
1,1	1,4	0,8	1,9
0,9	0,1	0,4	3,5
1,8	0,7	1,0	0,7
1,2	1,5	0,8	
0,2	1,1	0,5	
0,1	1,4	0,6	
0,8	1,2	1,4	
	0,1	4,7	
	2,9	0,3	
	1,1	3,1	
	0,1	0,9	
	1,2	0,8	
	1,8	0,9	
	1,1	0,3	
	3,1	1,7	
	3,6	0,1	
	3,5	2,2	
	0,7	0,8	
	0,7	0,3	
	0,8	0,4	
	0,3	22,7	
	2,5	0,5	
	4,2		
	2,9		
	0,4		
	0,7		
	0,5		

	0,9		
	0,8		
	1,1		
	0,7		







Summary Statistics for a

Count = 21

Average = 1,86667

Variance = 5,22333

Standard deviation = 2,28546

Minimum = 0,4

Maximum = 10,0

Range = 9,6

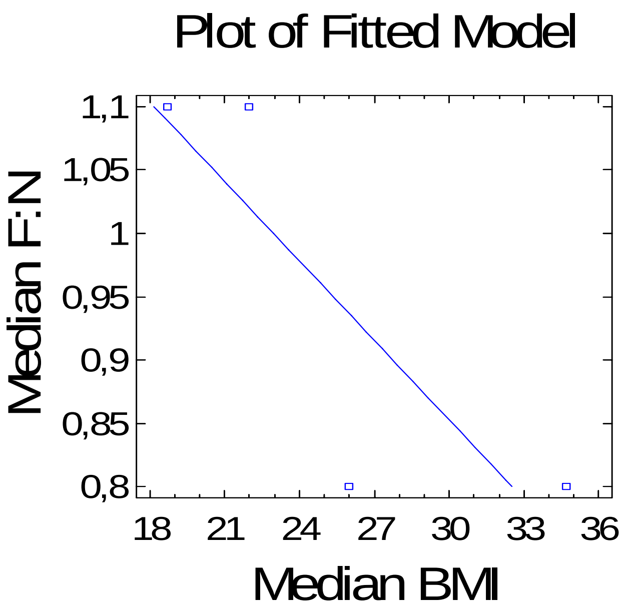
Stnd. skewness = 4,803

Stnd. kurtosis = 7,17631

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

1.1.2.4.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N

Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	1,48074	0,253712	5,8363	0,0281

Slope   -0,0209366   0,00974057   -2,14942   0,1646

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,0628097	1	0,0628097	4,62	0,1646
Residual	0,0271903	2	0,0135952		
Total (Corr.)	0,09	3			

Correlation Coefficient = -0,835395
R-squared = 69,7885 percent
R-squared (adjusted for d.f.) = 54,6828 percent
Standard Error of Est. = 0,116598
Mean absolute error = 0,0681956
Durbin-Watson statistic = 3,11571 (P=0,0004)
Lag 1 residual autocorrelation = -0,598489

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

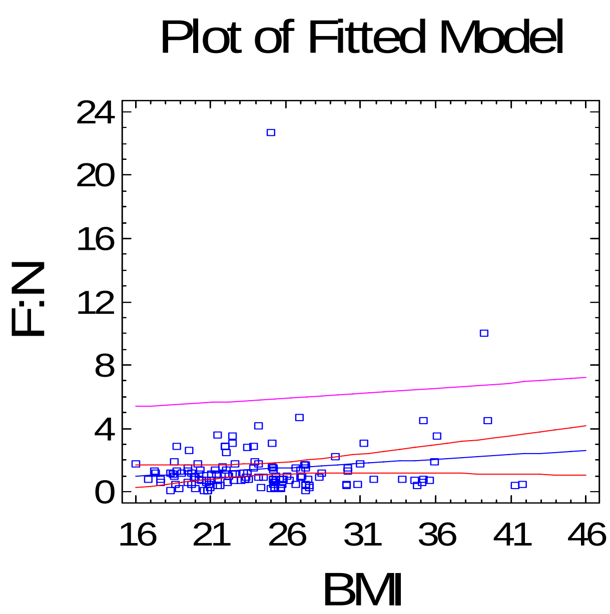
Median F:N = 1,48074 - 0,0209366*Median BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between Median F:N and Median BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 69,7885% of the variability in Median F:N. The correlation coefficient equals -0,835395, indicating a moderately strong relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,116598. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,0681956 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation. Plot the residuals versus row order to see if there is any pattern which can be seen.

1.1.2.4.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

		Standard	T	
Parameter	Estimate	Error	Statistic	P-Value

Intercept	0,0859281	0,908523	0,0945801	0,9248
Slope	0,0550075	0,0360344	1,52653	0,1293

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	11,3284	1	11,3284	2,33	0,1293
Residual	646,561	133	4,86136		
Total (Corr.)	657,889	134			

Correlation Coefficient = 0,131222

R-squared = 1,72192 percent

R-squared (adjusted for d.f.) = 0,982991 percent

Standard Error of Est. = 2,20485

Mean absolute error = 0,999581

Durbin-Watson statistic = 2,10897 (P=0,2643)

Lag 1 residual autocorrelation = -0,0560729

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 0,0859281 + 0,0550075*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 1,72192% of the variability in F:N. The correlation coefficient equals 0,131222, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 2,20485. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,999581 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.2.4.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Double reciprocal	-0,8723	76,10%

S-curve	0,8723	76,10%
Reciprocal-X	0,8723	76,10%
Logarithmic-X	-0,8588	73,75%
Multiplicative	-0,8588	73,75%
Square root-X	-0,8482	71,94%
Reciprocal-Y	0,8354	69,79%
Square root-Y	-0,8354	69,79%
Linear	-0,8354	69,79%
Exponential	-0,8354	69,79%
Logistic	<no fit>	
Log probit	<no fit>	

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the double reciprocal model yields the highest R-Squared value with 76,097%. This is 6,30842% higher than the currently selected linear model. To change models, select the Analysis Options dialog box.

1.1.2.4.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 1,1

Median of sample 2: 0,8

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 23,08

Average rank of sample 2: 24,0

W = 273,0   P-value = 0,825058

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,291429
Two-sided large sample K-S statistic = 0,984539
Approximate P value = 0,28823

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,291429, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.2.4.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	7,6557	3	2,5519	0,51	0,6733
Within groups	650,234	131	4,96362		
Total (Corr.)	657,889	134			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,514121, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

	Count	Mean	Homogeneous Groups
ug	25	1,104	X
ng	49	1,34082	X
üg	40	1,555	X
a	21	1,86667	X

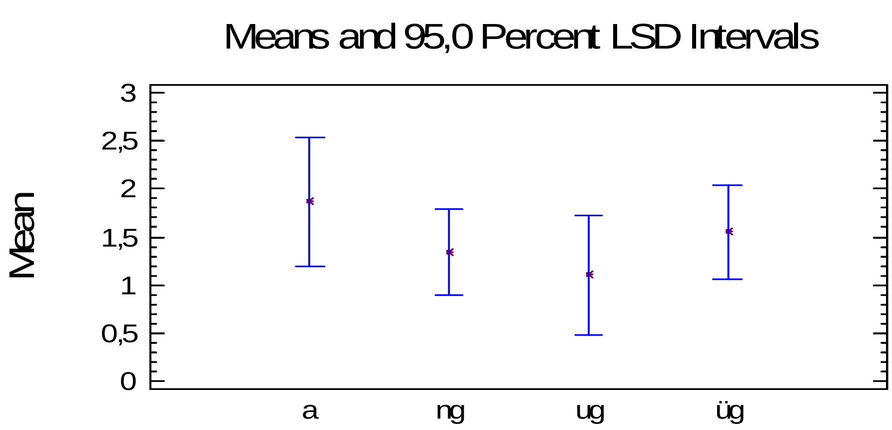
Contrast	Difference	+/- Limits
a - ng	0,52585	1,14953
a - ug	0,762667	1,3046
a - üg	0,311667	1,18769
ng - ug	0,236816	1,08324
ng - üg	-0,214184	0,939173
ug - üg	-0,451	1,12366

----

* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.2.4.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 0,95

Median of sample 2: 0,8

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 67,4298

Average rank of sample 2: 71,0952

W = 1262,0   P-value = 0,694931

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	4,48012	1	4,48012	0,91	0,3413
Within groups	653,409	133	4,91285		
Total (Corr.)	657,889	134			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,911919, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 2 variables at the 95,0% confidence level.

1.1.2.4.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

Alter

BMI

EGew

EWeise
F
F:N
Händer
Hunger
Krankh
N
Status

Data input: observations
Number of complete cases: 135
Missing value treatment: listwise
Standardized: yes

Number of components extracted: 4

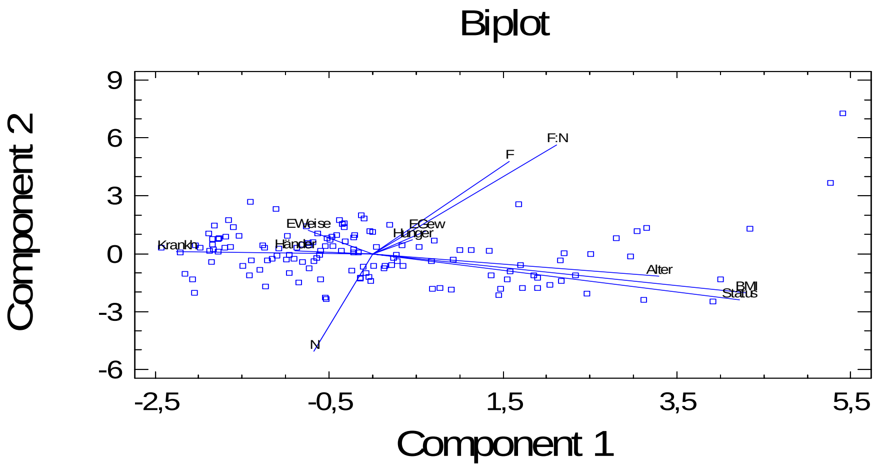
Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,57974	23,452	23,452
2	1,74304	15,846	39,298
3	1,28914	11,719	51,017
4	1,14923	10,448	61,465
5	0,994638	9,042	70,507
6	0,901616	8,197	78,704
7	0,776007	7,055	85,758
8	0,663576	6,033	91,791
9	0,548722	4,988	96,779
10	0,27337	2,485	99,264
11	0,0809264	0,736	100,000

The StatAdvisor

This procedure performs a principal components analysis. The

purpose of the analysis is to obtain a small number of linear combinations of the 11 variables which account for most of the variability in the data. In this case, 4 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 61,465% of the variability in the original data.



1.1.2.5 Schnitzel mit Pommes und Salat

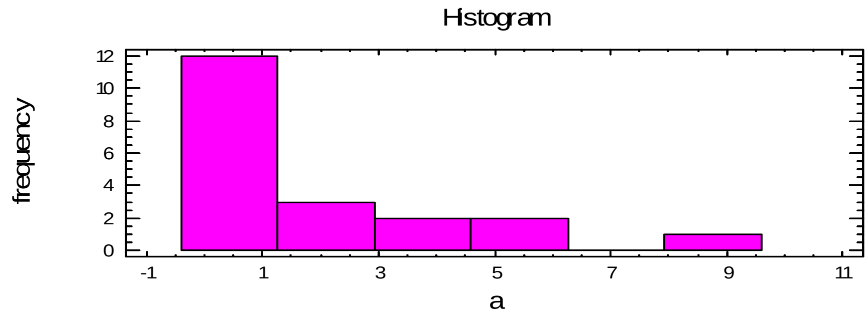
1.1.2.5.1 Prüfung auf Normalverteilung

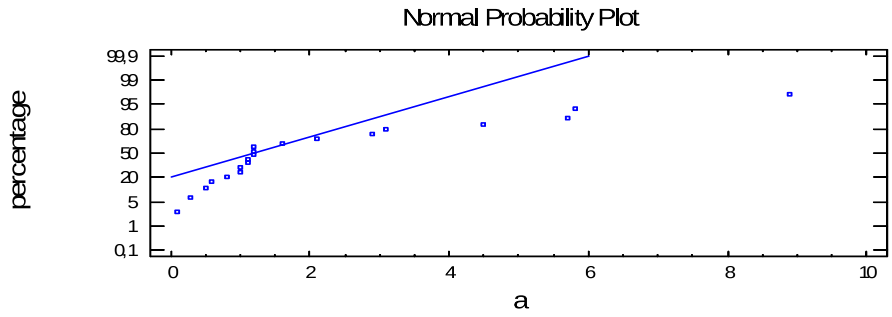
Tabelle 10: Fett – Nichtfett –Verhältnis - Fixation Length [s] der vier Gruppen - Schnitzel mit Pommes und Salat

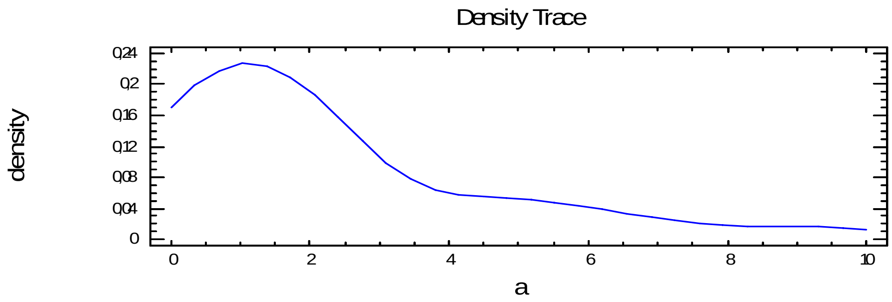
ug	ng	üg	a
4,6	3,9	2,7	1,1
0,3	0,9	1,3	
0,9	0,4	1,1	0,8
2,9	3,1	15,0	5,8
1,9	0,4	1,1	1,1
1,4	0,9	1,7	2,1
1,3	2,1	1,9	1,2
0,9	0,9	5,3	1,0
0,5	2,5	0,5	3,1
2,9	0,5	1,1	5,7
1,6	1,1	2,4	2,9

1,3	2,0	2,2	0,6
0,9	1,1	3,3	8,9
0,1	1,5	1,5	1,2
2,4	0,4	0,9	1,2
2,8	8,6	2,5	0,5
1,4	1,9	0,5	1,0
1,0	1,4	1,5	0,3
1,8	0,7	1,4	0,1
1,5	0,5	1,2	4,5
2,8	1,6	1,8	1,6
1,2	1,6	2,4	
0,5	0,3	1,2	
	1,2	3,4	
	0,7	2,3	
	1,8	1,8	
	1,2	0,5	
	2,2	1,8	
	5,4	1,6	
	0,9	2,2	
	1,0	11,4	
	1,3	1,7	
	0,6	0,8	
	1,5	0,2	
	0,8	1,2	
	1,4	0,5	
	2,4	1,5	
	1,7	1,9	
	1,5	1,9	
	0,7		

	2,2		
	1,2		
	2,0		
	2,8		
	1,4		
	8,8		
	1,5		
	1,3		
	2,5		







Summary Statistics for a

Count = 20

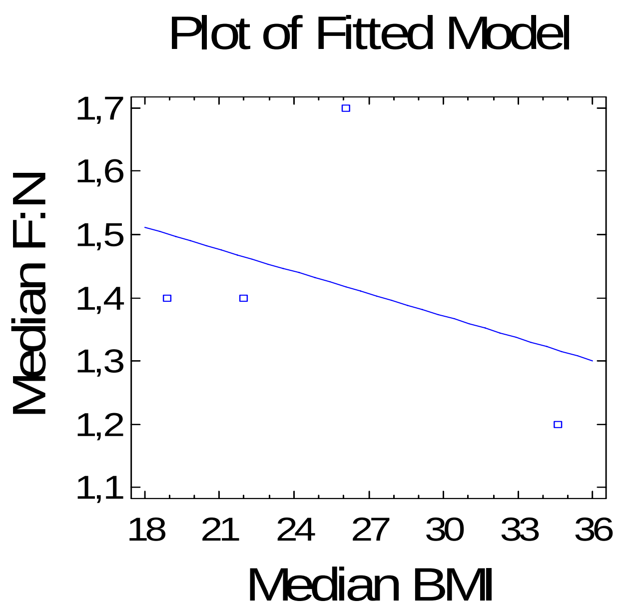
Average = 2,235

Variance = 5,30345
Standard deviation = 2,30292
Minimum = 0,1
Maximum = 8,9
Range = 8,8
Stnd. skewness = 3,10988
Stnd. kurtosis = 2,33264

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

1.1.2.5.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N

Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	1,72298	0,514946	3,34595	0,0789
Slope	-0,0117317	0,0197488	-0,594045	0,6127

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,0191226	1	0,0191226	0,35	0,6127
Residual	0,108377	2	0,0541887		
Total (Corr.)	0,1275	3			

Correlation Coefficient = -0,387274

R-squared = 14,9982 percent

R-squared (adjusted for d.f.) = -27,5028 percent

Standard Error of Est. = 0,232785

Mean absolute error = 0,141606

Durbin-Watson statistic = 2,60867 (P=0,0109)

Lag 1 residual autocorrelation = -0,414865

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

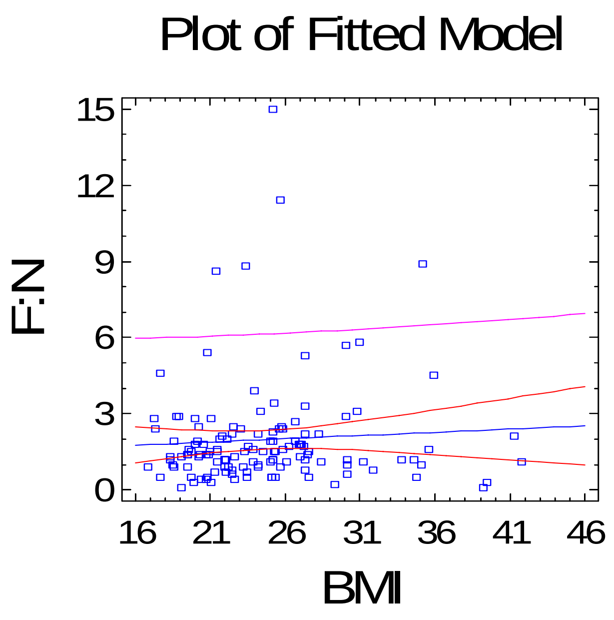
Median F:N = 1,72298 - 0,0117317*Median BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between Median F:N and Median BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 14,9982% of the variability in Median F:N. The correlation coefficient equals -0,387274, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,232785. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,141606 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation. Plot the residuals versus row order to see if there is any pattern which can be seen.

1.1.2.5.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	1,35069	0,90169	1,49796	0,1366
Slope	0,0254527	0,0358316	0,710344	0,4788

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	2,21515	1	2,21515	0,50	0,4788
Residual	566,311	129	4,39001		
Total (Corr.)	568,526	130			

Correlation Coefficient = 0,0624203

R-squared = 0,38963 percent

R-squared (adjusted for d.f.) = -0,382543 percent

Standard Error of Est. = 2,09523

Mean absolute error = 1,22107

Durbin-Watson statistic = 2,1308 (P=0,2281)

Lag 1 residual autocorrelation = -0,0691025

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 1,35069 + 0,0254527*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 0,38963% of the variability in F:N. The correlation coefficient equals 0,0624203, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 2,09523. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 1,22107 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in

the residuals.

1.1.2.5.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Reciprocal-Y	0,4928	24,29%
Exponential	-0,4402	19,38%
Square root-Y	-0,4137	17,12%
Linear	-0,3873	15,00%
Multiplicative	-0,3726	13,88%
Double reciprocal	-0,3574	12,77%
Square root-X	-0,3534	12,49%
Logarithmic-X	-0,3186	10,15%
S-curve	0,3029	9,18%
Reciprocal-X	0,2486	6,18%
Logistic	<no fit>	
Log probit	<no fit>	

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the reciprocal-Y model yields the highest R-Squared value with 24,2889%. This is 9,29071% higher than the currently selected linear model. To change models, select the Analysis Options dialog box.

1.1.2.5.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 1,4

Median of sample 2: 1,2

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 21,7826

Average rank of sample 2: 22,25

W = 235,0   P-value = 0,912635

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,256522
Two-sided large sample K-S statistic = 0,839013
Approximate P value = 0,492899

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,256522, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.2.5.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	9,77735	3	3,25912	0,74	0,5296
Within groups	558,748	127	4,39959		
Total (Corr.)	568,526	130			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,740777, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

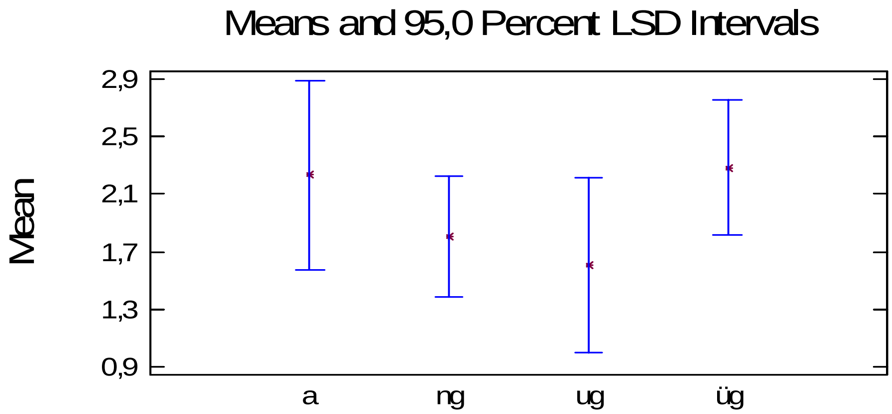
	Count	Mean	Homogeneous Groups
ug	23	1,60435	X
ng	49	1,80204	X
a	20	2,235	X
üg	39	2,28718	X

Contrast	Difference	+/- Limits
a - ng	0,432959	1,10135
a - ug	0,630652	1,26902
a - üg	-0,0521795	1,14154
ng - ug	0,197693	1,0491
ng - üg	-0,485139	0,890685
ug - üg	-0,682832	1,09122

* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.2.5.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 1,5

Median of sample 2: 1,2

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 66,3829

Average rank of sample 2: 63,875

W = 1067,5 P-value = 0,787914

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	1,56066	1	1,56066	0,36	0,5523
Within groups	566,965	129	4,39508		
Total (Corr.)	568,526	130			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,355093, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a

statistically significant difference between the means of the 2

variables at the 95,0% confidence level.

1.1.2.5.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

Alter

BMI

EGew

EWeise

F:N

FPommes

FSchnitzel

Händer

Hunger

Krankh

N

Status

Data input: observations

Number of complete cases: 131

Missing value treatment: listwise

Standardized: yes

Number of components extracted: 5

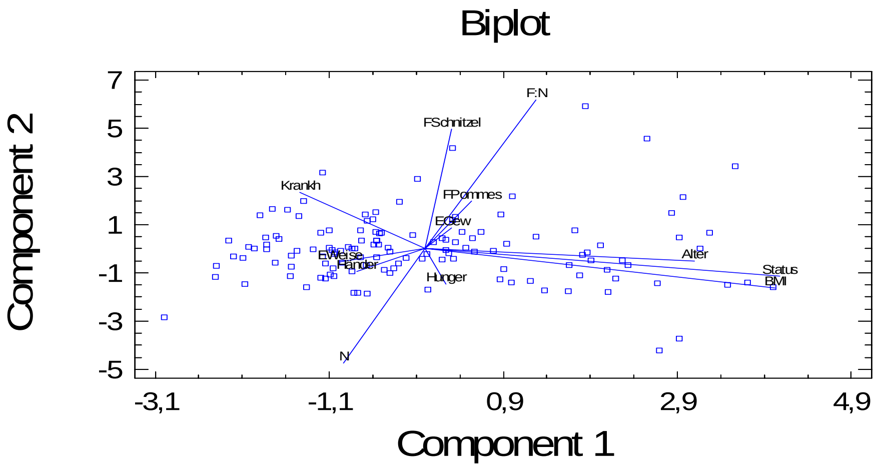
Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,45637	20,470	20,470
2	1,96773	16,398	36,867
3	1,34574	11,214	48,082
4	1,19825	9,985	58,067
5	1,18124	9,844	67,911

6	0,91817	7,651	75,562
7	0,851208	7,093	82,656
8	0,735558	6,130	88,785
9	0,572803	4,773	93,559
10	0,445203	3,710	97,269
11	0,243199	2,027	99,296
12	0,0845358	0,704	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 12 variables which account for most of the variability in the data. In this case, 5 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 67,911% of the variability in the original data.



1.1.3 Fixation Count

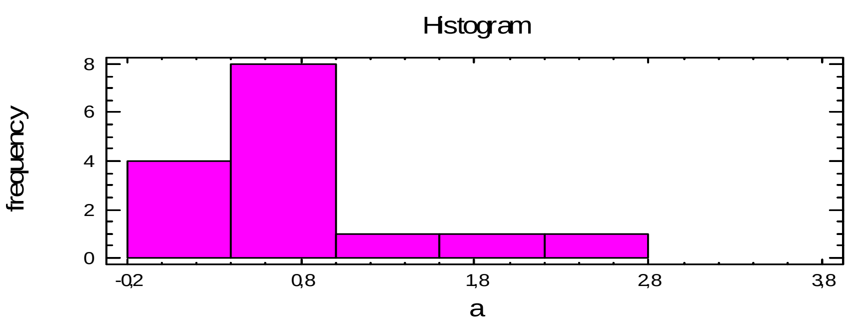
1.1.3.1 Hamburger und Birne

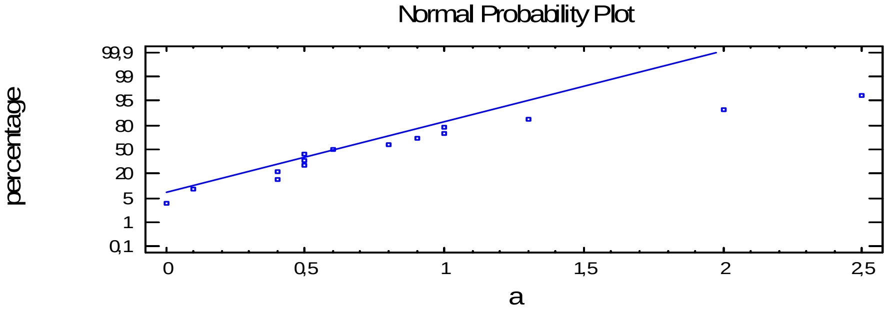
1.1.3.1.1 Prüfung auf Normalverteilung

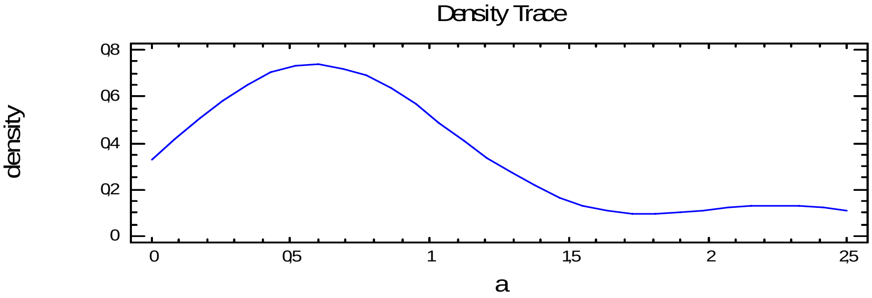
Tabelle 11: Fett – Nichtfett –Verhältnis - Fixation Count der vier Gruppen - Hamburger und Birne

ug	ng	üg	a
0,0	0,3	0,2	0,1
0,3	0,1	0,0	1,0
0,0	0,6	0,2	0,0
1,3	0,1	0,3	2,0
0,0	0,3	0,3	0,2
0,5	0,0	0,1	0,1
0,8	0,0	1,5	0,5
0,0	0,4	0,3	0,1
0,0	0,3	0,0	0,4
0,1	0,2	0,1	2,5
0,1	0,1	0,1	0,0
0,3	0,1	1,7	0,9
0,3	1,0	1,7	0,6
0,6	0,5	0,4	0,4
0,5	0,2	0,6	1,3
0,0	0,6	0,4	0,2
0,3	0,3	0,5	1,0
0,1	3,3	0,2	0,8
0,3	0,3	0,0	0,4
0,3	0,2	0,1	
0,1	0,0	0,0	0,5
0,5	0,2	0,3	0,5
	0,2	0,5	
	1,3	1,1	

	1,4	0,2	
	0,7	0,9	
	0,4	1,8	
	0,0	1,0	
	2,3	0,0	
	0,1	0,3	
	1,3	0,0	
	0,2	0,2	
	0,0	1,0	
	0,2	1,0	
	0,2	0,4	
	0,3	2,0	
	0,8	0,3	
	7,0	0,2	
	2,0	0,5	
	1,2	1,0	
	0,3	0,0	
	2,5		
	0,1		
	0,4		
	0,4		
	1,2		







Summary Statistics for a

Count = 15

Average = 0,833333

Variance = 0,458095

Standard deviation = 0,676827

Minimum = 0,0

Maximum = 2,5

Range = 2,5

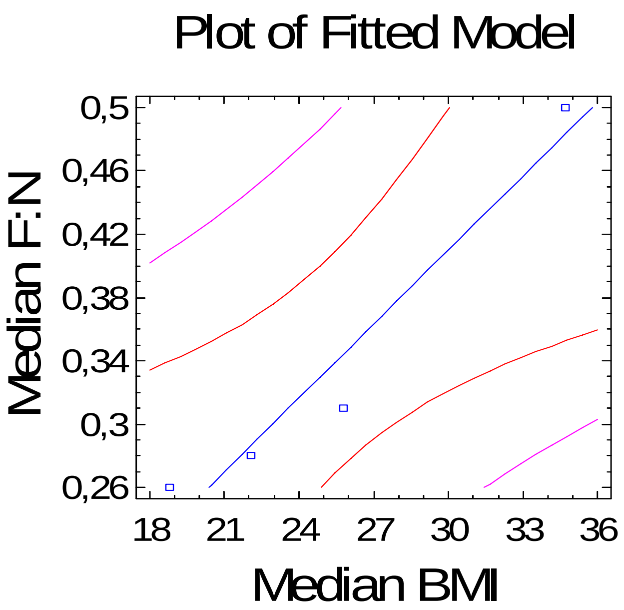
Stnd. skewness = 2,13053

Stnd. kurtosis = 1,36688

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is within the range expected for data from a normal distribution.

1.1.3.1.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N

Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	-0,0580491	0,0714301	-0,812671	0,5018
Slope	0,0156035	0,00274347	5,68752	0,0296

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,0343511	1	0,0343511	32,35	0,0296

Residual 0,00212386 2 0,00106193

Total (Corr.) 0,036475 3

Correlation Coefficient = 0,970449
R-squared = 94,1772 percent
R-squared (adjusted for d.f.) = 91,2658 percent
Standard Error of Est. = 0,0325873
Mean absolute error = 0,0206551
Durbin-Watson statistic = 2,05992 (P=0,0971)
Lag 1 residual autocorrelation = -0,238552

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

Median F:N = -0,0580491 + 0,0156035*Median BMI

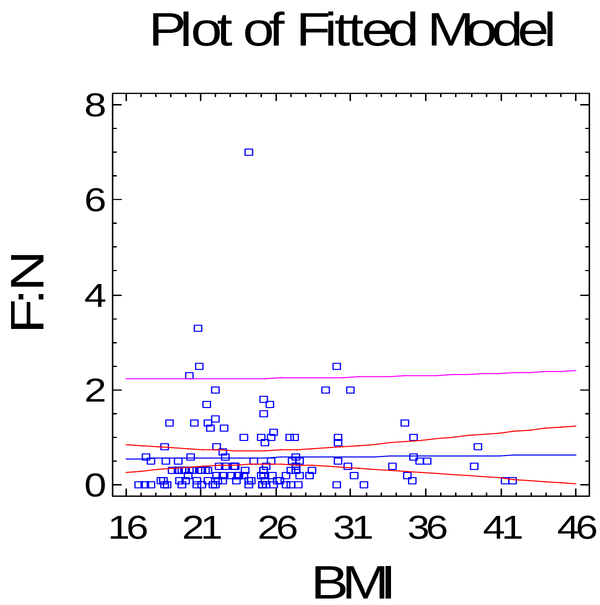
Since the P-value in the ANOVA table is less than 0.05, there is a statistically significant relationship between Median F:N and Median BMI at the 95% confidence level.

The R-Squared statistic indicates that the model as fitted explains 94,1772% of the variability in Median F:N. The correlation coefficient equals 0,970449, indicating a relatively strong relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,0325873. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,0206551 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is

greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.3.1.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	0,507849	0,360139	1,41015	0,1609
Slope	0,00275454	0,0142173	0,193745	0,8467

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,0264021	1	0,0264021	0,04	0,8467
Residual	90,0297	128	0,703357		
Total (Corr.)	90,0561	129			

Correlation Coefficient = 0,0171223

R-squared = 0,0293174 percent

R-squared (adjusted for d.f.) = -0,751704 percent

Standard Error of Est. = 0,838664

Mean absolute error = 0,513345

Durbin-Watson statistic = 1,90216 (P=0,2895)

Lag 1 residual autocorrelation = 0,0484432

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 0,507849 + 0,00275454*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 0,0293174% of the variability in F:N. The correlation coefficient equals 0,0171223, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,838664. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,513345 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.3.1.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Reciprocal-Y	-0,9935	98,71%
Exponential	0,9832	96,67%
Square root-Y	0,9770	95,45%
Logistic	0,9765	95,35%
Linear	0,9704	94,18%
Multiplicative	0,9630	92,74%
Square root-X	0,9589	91,96%
Double reciprocal	0,9562	91,43%
Log probit	0,9516	90,55%
Logarithmic-X	0,9451	89,32%

S-curve	-0,9337	87,19%
Reciprocal-X	-0,9108	82,95%

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the reciprocal-Y model yields the highest R-Squared value with 98,7108%. This is 4,53356% higher than the currently selected linear model. To change models, select the Analysis Options dialog box.

1.1.3.1.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 0,3

Median of sample 2: 0,5

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

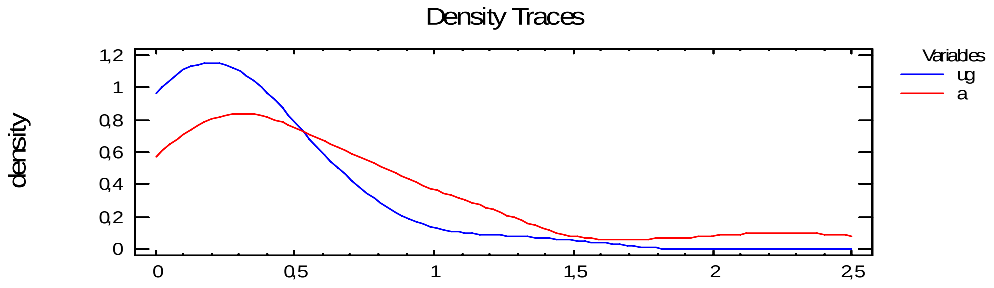
Average rank of sample 1: 18,0

Average rank of sample 2: 26,1905

W = 319,0   P-value = 0,0320535

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is less than 0,05, there is a statistically significant difference between the medians at the 95,0% confidence level.



Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,393939
Two-sided large sample K-S statistic = 1,29127
Approximate P value = 0,0712491

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,393939, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.3.1.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	3,09883	3	1,03294	1,50	0,2187
Within groups	86,9572	126	0,690137		
Total (Corr.)	90,0561	129			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 1,49672, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

	Count	Mean	Homogeneous Groups
ug	22	0,290909	X
üg	41	0,521951	XX
a	21	0,642857	XX
ng	46	0,730435	X

Contrast	Difference	+/- Limits
a - ng	-0,0875776	0,432969
a - ug	0,351948	0,501558

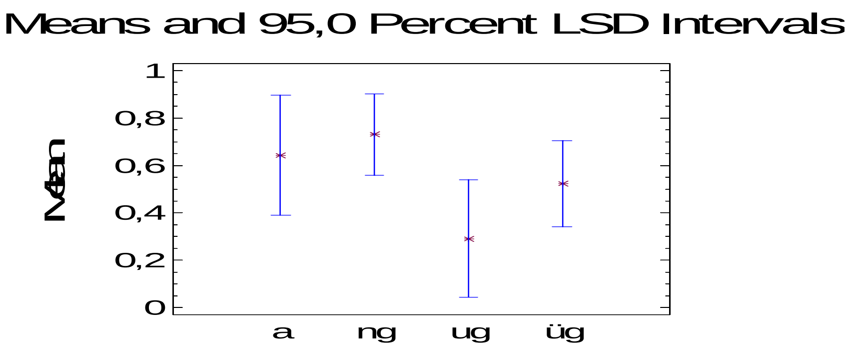
a - üg	0,120906	0,441166
ng - ug	*0,439526	0,426159
ng - üg	0,208484	0,353099
ug - üg	-0,231042	0,434485

----

* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. An asterisk has been placed next to 1 pair, indicating that this pair shows a statistically significant difference at the 95,0% confidence level. At the top of the page, 2 homogenous groups are identified using columns of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.3.1.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 0,3

Median of sample 2: 0,5

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 63,6927

Average rank of sample 2: 74,881

W = 1341,5   P-value = 0,211082

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	0,111437	1	0,111437	0,16	0,6911
Within groups	89,9446	128	0,702692		
Total (Corr.)	90,0561	129			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,158586, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 2 variables at the 95,0% confidence level.

1.1.3.1.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

- Alter
- Birne
- BMI
- EGew
- EWeise
- F
- F:N
- Hamb
- Hamb:Birne

Händer
Hunger
Krankh
N
Status

Data input: observations
Number of complete cases: 129
Missing value treatment: listwise
Standardized: yes

Number of components extracted: 5

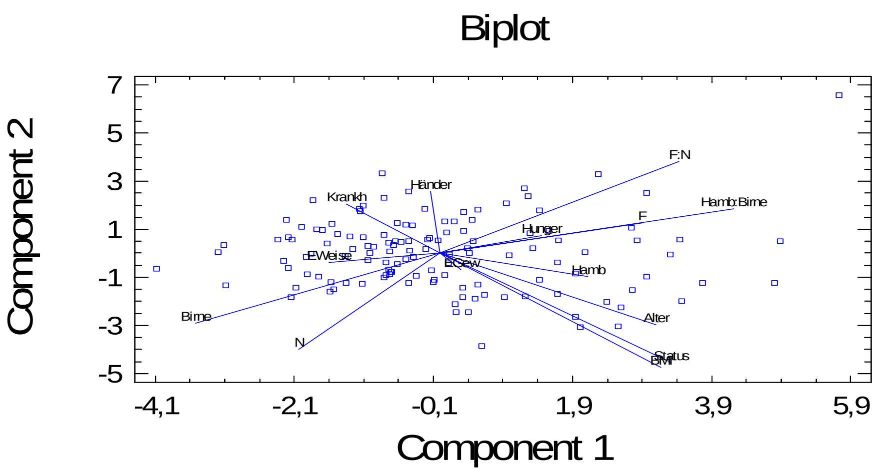
Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	3,07113	21,937	21,937
2	2,2599	16,142	38,079
3	1,98016	14,144	52,223
4	1,14676	8,191	60,414
5	1,04321	7,452	67,865
6	0,920646	6,576	74,441
7	0,881044	6,293	80,735
8	0,83489	5,963	86,698
9	0,734964	5,250	91,948
10	0,503013	3,593	95,541
11	0,293826	2,099	97,640
12	0,132481	0,946	98,586
13	0,109501	0,782	99,368
14	0,0884749	0,632	100,000

The StatAdvisor

This procedure performs a principal components analysis. The

purpose of the analysis is to obtain a small number of linear combinations of the 14 variables which account for most of the variability in the data. In this case, 5 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 67,8654% of the variability in the original data.



1.1.3.2 Praline und Erdbeere

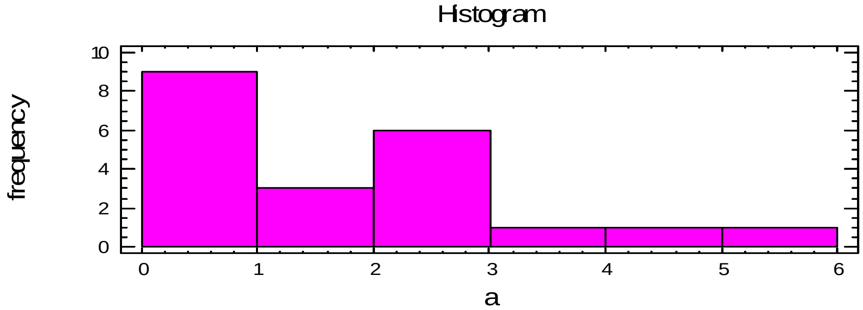
1.1.3.2.1 Prüfung auf Normalverteilung

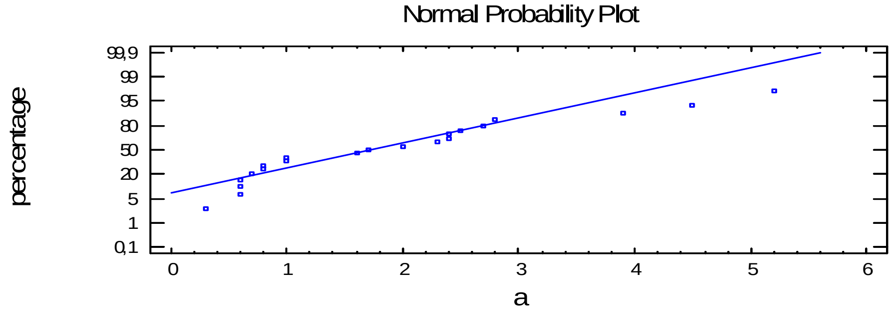
Tabelle 12: Fett – Nichtfett –Verhältnis - Fixation Count der vier Gruppen - Praline und Erdbeere

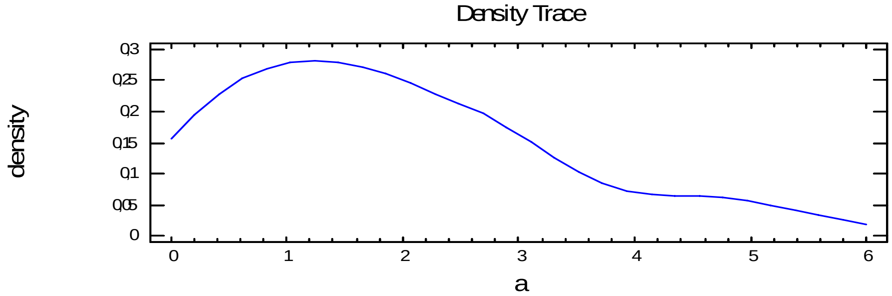
ug	ng	üg	a
1,8	0,8	4,0	1,7
0,5	1,1	1,6	1,0
2,0	0,9	4,3	2,7
1,5	2,0	1,3	0,6
1,4	3,0	3,8	2,4
2,0	1,2	0,8	5,2
1,7	1,4	1,7	1,6
0,8	2,8	2,0	2,3
1,0	1,5	1,5	3,9
1,1	0,6	0,9	2,4
6,0	1,4	1,0	2,0
1,3	1,8	2,0	0,8

0,8	4,5	1,5	2,5
0,6	1,5	1,0	0,6
0,8	1,4	1,4	2,8
2,5	0,3	1,7	0,8
0,8	3,2	0,8	1,0
0,2	2,6	1,5	0,3
1,6	0,8	2,0	0,6
3,6	7,0	2,0	4,5
1,2	2,6	1,0	0,7
1,2	0,6	1,7	
2,0	1,0	1,6	
	2,3	1,0	
	0,6	1,1	
	2,0	4,5	
	1,1	0,8	
	2,6	2,3	
	1,3	1,5	
	2,5	0,9	
	0,8	1,6	
	1,4	1,5	
	0,3	0,4	
	0,8	0,4	
	0,9	0,9	
	1,8	0,9	
	4,3	0,3	
	1,8	1,7	
	1,4	1,3	
	0,7		
	0,9		

	1,1		
	1,5		
	8,5		
	2,5		
	2,5		
	0,8		
	1,1		
	1,5		







Summary Statistics for a

Count = 21

Average = 1,92381

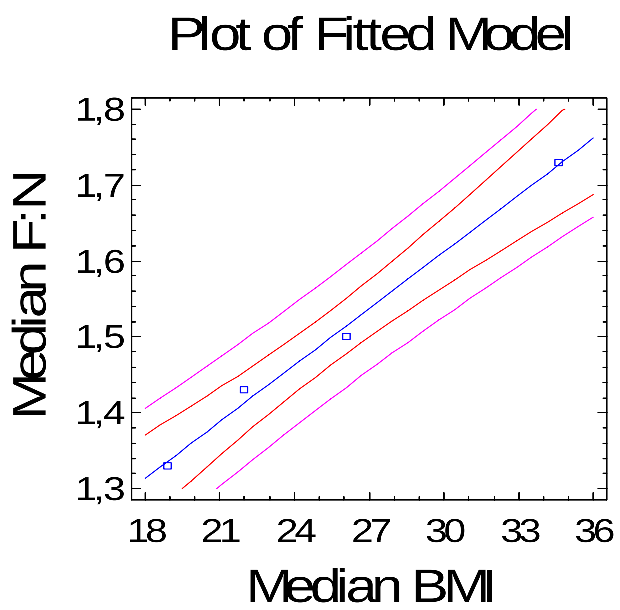
Variance = 1,8679

Standard deviation = 1,36671
Minimum = 0,3
Maximum = 5,2
Range = 4,9
Stnd. skewness = 1,7838
Stnd. kurtosis = 0,317061

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is within the range expected for data from a normal distribution. The standardized kurtosis value is within the range expected for data from a normal distribution.

1.1.3.2.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N
Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	0,865151	0,0370483	23,352	0,0018
Slope	0,0248956	0,00142085	17,5217	0,0032

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,086114	1	0,086114	307,01	0,0032
Residual	0,000560987	2	0,000280493		
Total (Corr.)	0,086675	3			

Correlation Coefficient = 0,996759
R-squared = 99,3528 percent
R-squared (adjusted for d.f.) = 99,0292 percent
Standard Error of Est. = 0,0167479
Mean absolute error = 0,0103026
Durbin-Watson statistic = 3,36482 (P=0,0000)
Lag 1 residual autocorrelation = -0,721818

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

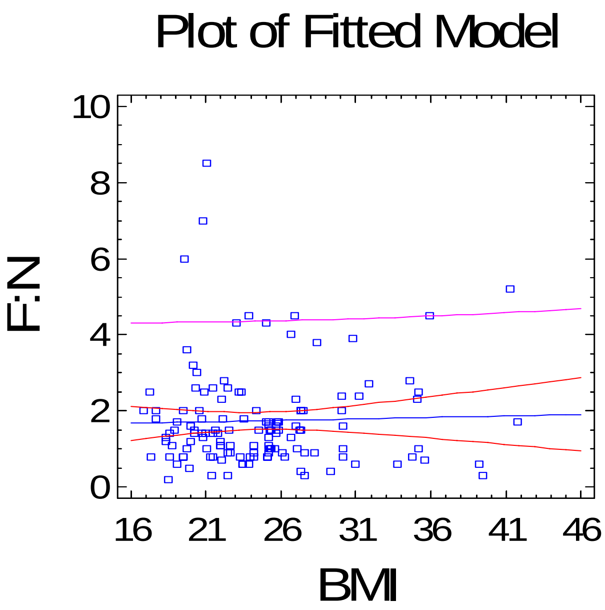
Median F:N = 0,865151 + 0,0248956*Median BMI

Since the P-value in the ANOVA table is less than 0.01, there is a statistically significant relationship between Median F:N and Median BMI at the 99% confidence level.

The R-Squared statistic indicates that the model as fitted explains 99,3528% of the variability in Median F:N. The correlation coefficient equals 0,996759, indicating a relatively strong relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,0167479. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,0103026 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation. Plot the residuals versus row order to see if there is any pattern which can be seen.

1.1.3.2.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

	Standard	T		
Parameter Estimate	Error	Statistic	P-Value	

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	1,55236	0,559982	2,77215	0,0064
Slope	0,00768876	0,0221729	0,346764	0,7293

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,208629	1	0,208629	0,12	0,7293
Residual	225,554	130	1,73503		
Total (Corr.)	225,762	131			

Correlation Coefficient = 0,0303992

R-squared = 0,0924109 percent

R-squared (adjusted for d.f.) = -0,676109 percent

Standard Error of Est. = 1,31721

Mean absolute error = 0,898457

Durbin-Watson statistic = 1,54645 (P=0,0043)

Lag 1 residual autocorrelation = 0,222021

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 1,55236 + 0,00768876*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 0,0924109% of the variability in F:N. The correlation coefficient equals 0,0303992, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 1,31721. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,898457 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation.

Plot the residuals versus row order to see if there is any patternPlot the residuals versus row order to see if there is any pattern

which can be seen.

1.1.3.2.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Linear	0,9968	99,35%
Square root-Y	0,9967	99,33%
Exponential	0,9961	99,23%
Square root-X	0,9953	99,06%
Multiplicative	0,9948	98,97%
Reciprocal-Y	-0,9938	98,76%
Logarithmic-X	0,9920	98,40%
Double reciprocal	0,9908	98,18%
S-curve	-0,9859	97,20%
Reciprocal-X	-0,9795	95,94%
Logistic	<no fit>	
Log probit	<no fit>	

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the linear model yields the highest R-Squared value with 99,3528%. This is the currently selected model.

1.1.3.2.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 1,3

Median of sample 2: 1,7

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 21,1087

Average rank of sample 2: 24,0238

W = 273,5   P-value = 0,45819

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,345756
Two-sided large sample K-S statistic = 1,14556
Approximate P value = 0,144965

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,345756, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.3.2.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	2,77231	3	0,924104	0,53	0,6622
Within groups	222,99	128	1,74211		
Total (Corr.)	225,762	131			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,530451, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

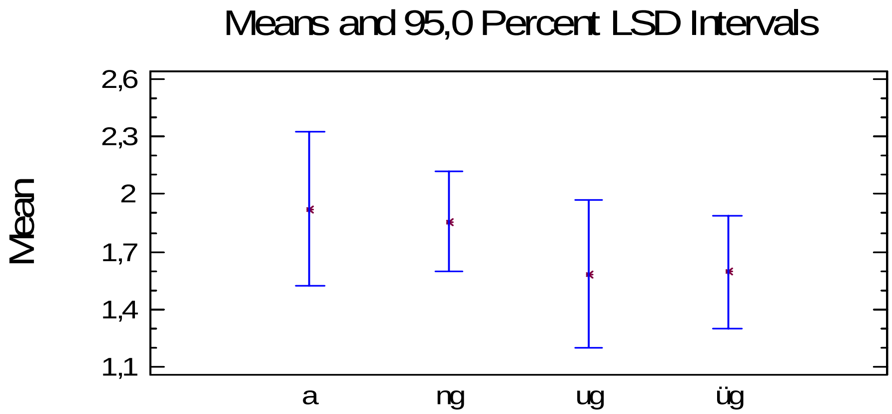
	Count	Mean	Homogeneous Groups
ug	23	1,58261	X
üg	39	1,59487	X
ng	49	1,85714	X
a	21	1,92381	X

Contrast	Difference	+/- Limits
a - ng	0,0666667	0,681167
a - ug	0,341201	0,788252
a - üg	0,328938	0,70688
ng - ug	0,274534	0,66011
ng - üg	0,262271	0,560432
ug - üg	-0,0122631	0,686613

----
* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.3.2.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 1,4

Median of sample 2: 1,7

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 65,7252

Average rank of sample 2: 70,5952

W = 1251,5   P-value = 0,59419

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	0,821626	1	0,821626	0,47	0,4920
Within groups	224,941	130	1,73031		
Total (Corr.)	225,762	131			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,474842, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a

statistically significant difference between the means of the 2

variables at the 95,0% confidence level.

1.1.3.2.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

Alter
BMI
EGew
Erdb
EWeise
F:N
Händer
Hunger
Krankh
Praline
Status

Data input: observations
Number of complete cases: 132
Missing value treatment: listwise
Standardized: yes

Number of components extracted: 4

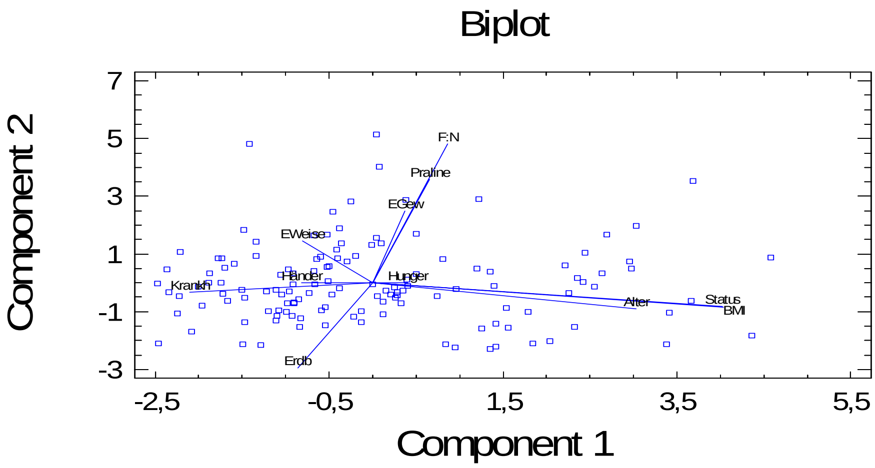
Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,50004	22,728	22,728
2	1,91815	17,438	40,165
3	1,37026	12,457	52,622
4	1,08734	9,885	62,507
5	0,985704	8,961	71,468
6	0,945544	8,596	80,064

7	0,81187	7,381	87,445
8	0,667018	6,064	93,508
9	0,472423	4,295	97,803
10	0,157667	1,433	99,237
11	0,0839846	0,763	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 11 variables which account for most of the variability in the data. In this case, 4 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 62,5072% of the variability in the original data.



1.1.3.3 Chips und Weintrauben

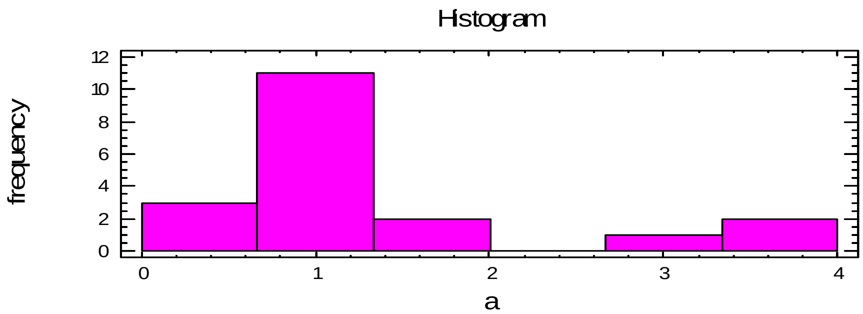
1.1.3.3.1 Prüfung auf Normalverteilung

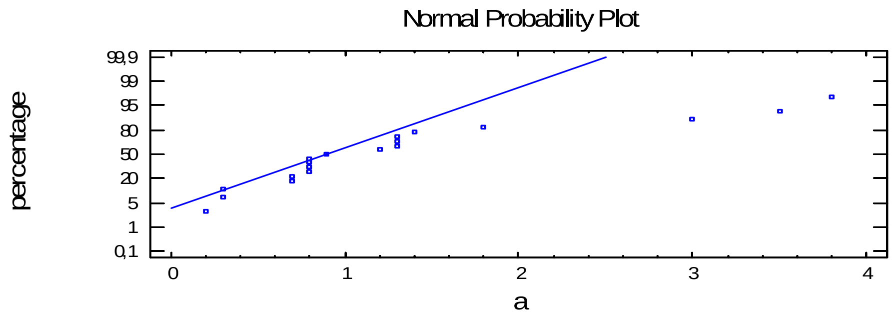
Tabelle 13: Fett – Nichtfett –Verhältnis - Fixation Count der vier Gruppen - Chips und Weintrauben

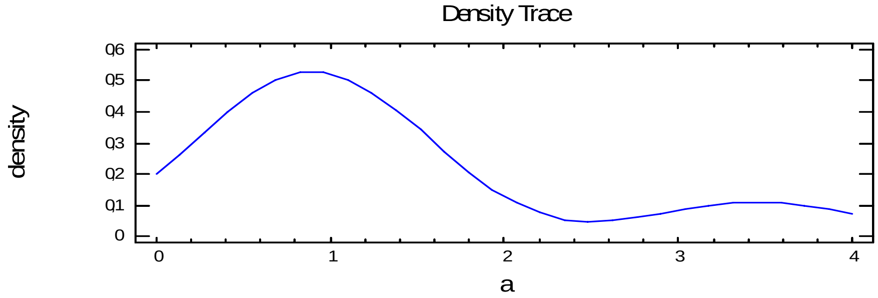
ug	ng	üg	a
0,9	0,5	0,5	3,8
0,5	0,6	2,0	0,8
0,8	0,7	1,0	1,3

0,5	1,3	1,1	0,7
0,3	0,1	2,0	1,3
1,7	0,9	0,4	1,8
0,7	0,7	1,8	0,8
3,5	0,6	3,7	0,7
1,0	1,4	0,7	1,2
1,7	1,3	1,0	0,2
0,7	0,8	1,4	1,4
0,6	0,3	1,8	3,0
1,0	1,4	1,0	0,8
0,1	1,2	1,1	0,8
0,7	3,0	0,9	0,9
1,0	1,4	0,3	3,5
0,7	0,3	0,9	0,3
0,4	6,0	0,8	0,3
1,1	0,9	1,0	1,3
	1,5	0,6	1,4
	0,6	0,8	1,0
	1,1	0,8	
	0,8	0,7	
	0,6	1,2	
	1,4	0,5	
	0,7	0,5	
	1,3	2,0	
	0,0	1,1	
	0,8	1,1	
	0,9	0,4	
	3,5	0,9	
	0,9	3,8	

	1,8	0,7	
	0,7	0,5	
	0,7	0,8	
	0,9	0,4	
	0,9	0,7	
	1,9	1,2	
	0,5	1,5	
	0,7		
	0,9		
	0,8		
	0,2		
	0,6		
	1,2		
	1,0		
	3,5		
	0,9		
	1,0		
	1,1		
	2,3		







Summary Statistics for a

Count = 19

Average = 1,31053

Variance = 1,07433

Standard deviation = 1,0365

Minimum = 0,2

Maximum = 3,8

Range = 3,6

Stnd. skewness = 2,61693

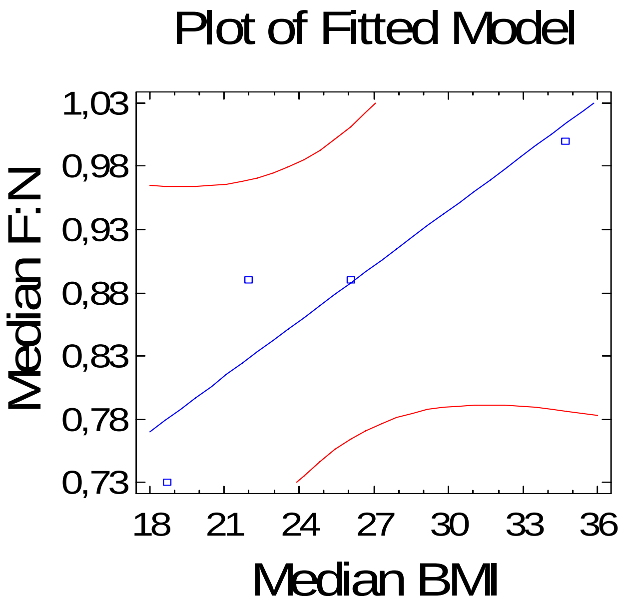
Stnd. kurtosis = 1,23481

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized

skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is within the range expected for data from a normal distribution.

1.1.3.3.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N

Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	0,507077	0,124208	4,08248	0,0551
Slope	0,014598	0,00476405	3,06419	0,0920

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,0305645	1	0,0305645	9,39	0,0920
Residual	0,00651051	2	0,00325525		

Total (Corr.)   0,037075   3

Correlation Coefficient = 0,907963

R-squared = 82,4396 percent

R-squared (adjusted for d.f.) = 73,6595 percent

Standard Error of Est. = 0,0570548

Mean absolute error = 0,0318423

Durbin-Watson statistic = 2,5081 (P=0,0170)

Lag 1 residual autocorrelation = -0,460757

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

Median F:N = 0,507077 + 0,014598*Median BMI

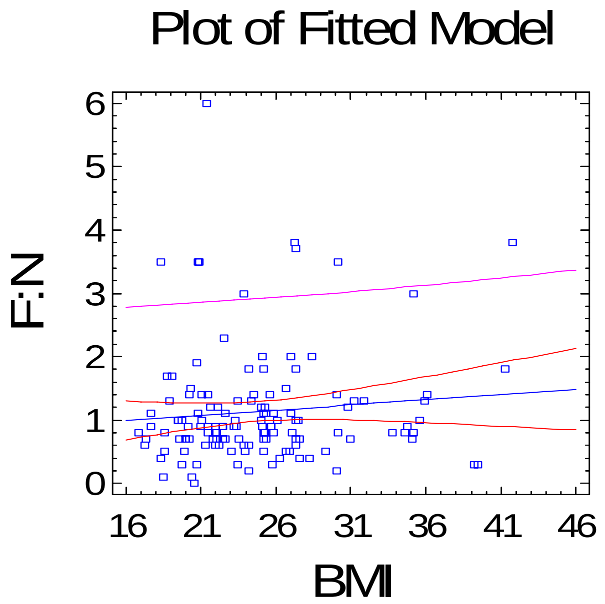
Since the P-value in the ANOVA table is less than 0.10, there is a statistically significant relationship between Median F:N and Median BMI at the 90% confidence level.

The R-Squared statistic indicates that the model as fitted explains 82,4396% of the variability in Median F:N. The correlation coefficient equals 0,907963, indicating a relatively strong relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,0570548. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,0318423 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation.

Plot the residuals versus row order to see if there is any pattern which can be seen.

1.1.3.3.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	0,728523	0,38046	1,91485	0,0577
Slope	0,0164662	0,0149816	1,0991	0,2738

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,967339	1	0,967339	1,21	0,2738
Residual	102,498	128	0,800765		
Total (Corr.)	103,465	129			

Correlation Coefficient = 0,0966923

R-squared = 0,93494 percent

R-squared (adjusted for d.f.) = 0,160994 percent

Standard Error of Est. = 0,894855

Mean absolute error = 0,576766

Durbin-Watson statistic = 2,17286 (P=0,1631)

Lag 1 residual autocorrelation = -0,0888068

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 0,728523 + 0,0164662*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and

BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 0,93494% of the variability in F:N. The correlation coefficient equals 0,0966923, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,894855. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,576766 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.3.3.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Reciprocal-X	-0,9464	89,56%
S-curve	-0,9367	87,74%
Logarithmic-X	0,9298	86,45%
Double reciprocal	0,9251	85,59%
Square root-X	0,9194	84,53%
Multiplicative	0,9154	83,80%
Linear	0,9080	82,44%
Square root-Y	0,8988	80,79%
Exponential	0,8893	79,08%

Reciprocal-Y	-0,8692	75,55%
Logistic	<no fit>	
Log probit	<no fit>	

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the reciprocal-X model yields the highest R-Squared value with 89,5584%. This is 7,11873% higher than the currently selected linear model. To change models, select the Analysis Options dialog box.

1.1.3.3.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 0,7

Median of sample 2: 1,0

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 17,5

Average rank of sample 2: 23,2143

W = 256,5 P-value = 0,124569

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,383459
Two-sided large sample K-S statistic = 1,21109
Approximate P value = 0,106433

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,383459, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.3.3.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	1,31803	3	0,439342	0,54	0,6545
Within groups	102,147	126	0,810693		
Total (Corr.)	103,465	129			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,541934, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

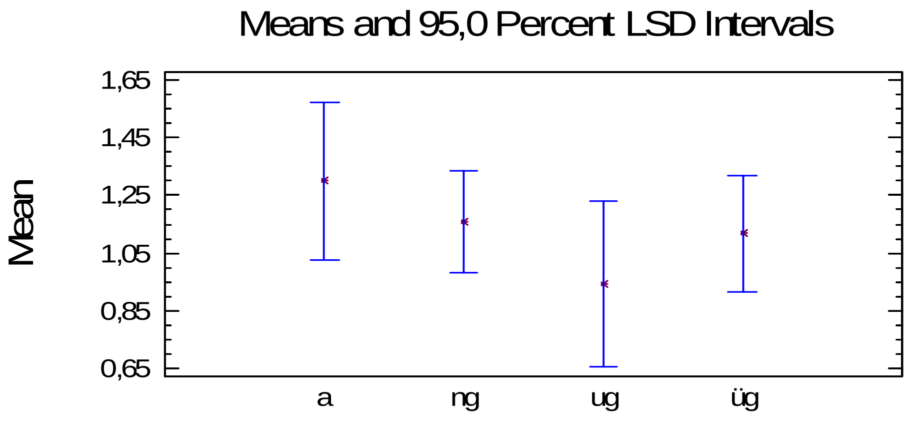
	Count	Mean	Homogeneous Groups
ug	19	0,942105	X
üg	39	1,11795	X
ng	51	1,15882	X
a	21	1,3	X

Contrast	Difference	+/- Limits
a - ng	0,141176	0,461998
a - ug	0,357895	0,564172
a - üg	0,182051	0,482283
ng - ug	0,216718	0,478912
ng - üg	0,0408748	0,379029
ug - üg	-0,175843	0,498509

----
* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.3.3.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 0,9

Median of sample 2: 1,0

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 64,0413

Average rank of sample 2: 73,0714

W = 1303,5   P-value = 0,31472

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	0,659803	1	0,659803	0,82	0,3664
Within groups	102,806	128	0,803168		

Total (Corr.)	103,465	129

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,821501, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 2 variables at the 95,0% confidence level.

1.1.3.3.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

Alter
BMI
EGew
EWeise
F
F:N
Händer
Hunger
Krankh
N
Status

Data input: observations

Number of complete cases: 130

Missing value treatment: listwise
Standardized: yes

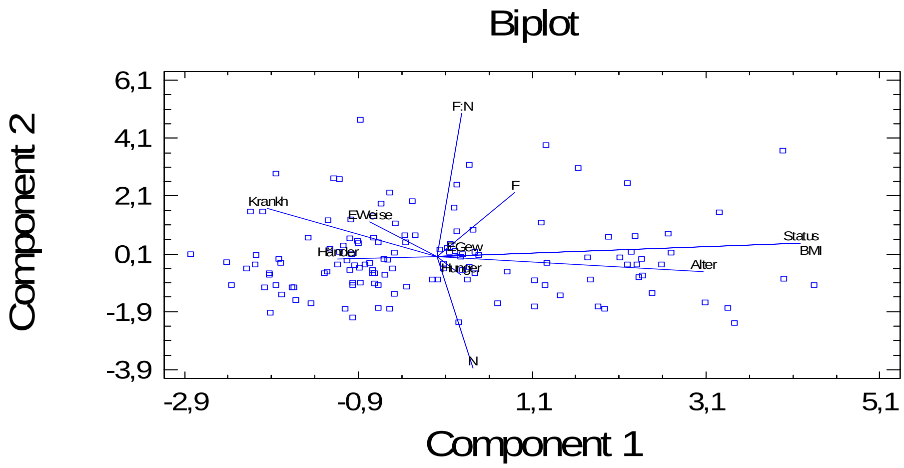
Number of components extracted: 5

Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,49486	22,681	22,681
2	1,72738	15,703	38,384
3	1,4592	13,265	51,649
4	1,14226	10,384	62,034
5	1,02864	9,351	71,385
6	0,905655	8,233	79,618
7	0,744325	6,767	86,385
8	0,707383	6,431	92,815
9	0,523447	4,759	97,574
10	0,179212	1,629	99,203
11	0,087648	0,797	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 11 variables which account for most of the variability in the data. In this case, 5 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 71,3848% of the variability in the original data.



1.1.3.4 Bananen und Schokolade

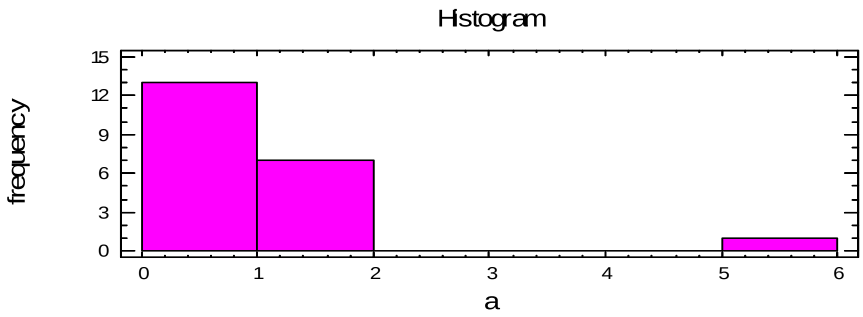
1.1.3.4.1 Prüfung auf Normalverteilung

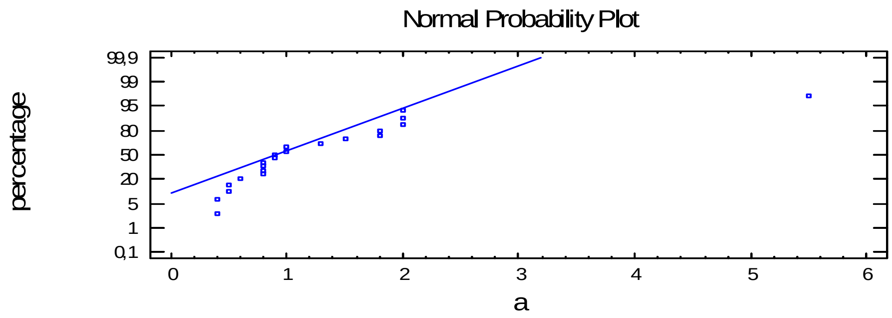
Tabelle 14: Fett – Nichtfett –Verhältnis - Fixation Count der vier Gruppen - Bananen und Schokolade

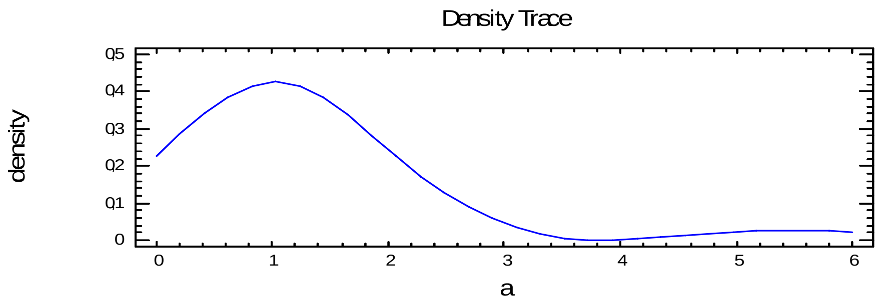
ug	ng	üg	a
1,7	1,2	0,9	0,4
1,1	1,6	0,9	0,9
1,3	0,8	0,3	2,0
0,8	0,4	0,6	1,5
0,1	0,8	1,9	2,0
0,7	0,8	0,8	0,4
1,3	1,0	0,8	0,9
1,6	0,8	0,3	1,0
0,5	0,8	1,0	0,6
0,7	2,0	0,9	1,0
1,0	0,4	1,0	0,5
1,3	0,7	2,0	0,8
0,6	1,5	1,8	0,8
1,6	0,8	0,8	0,5
0,9	0,8	0,4	0,8
0,7	0,9	0,4	1,3
1,0	1,4	4,5	1,8

1,8	1,6	0,2	5,5
0,9	1,2	1,2	2,0
1,2	0,1	1,3	1,8
1,5	0,8	1,2	0,8
0,6	1,4	1,3	
0,3	1,6	0,6	
0,2	1,3	0,7	
0,8	1,4	1,0	
	0,2	2,2	
	2,4	0,2	
	0,8	2,6	
	0,2	0,8	
	0,9	0,5	
	1,5	1,2	
	1,0	0,6	
	1,0	1,6	
	2,3	0,2	
	3,0	2,6	
	0,5	1,3	
	0,5	0,1	
	0,6	0,4	
	0,6	20,0	
	1,6	0,5	
	1,0		
	20,0		
	0,4		
	1,0		
	0,8		
	1,1		

	0,8		
	1,0		
	0,6		







Summary Statistics for a

Count = 21

Average = 1,3

Variance = 1,227

Standard deviation = 1,1077

Minimum = 0,4

Maximum = 5,5

Range = 5,1

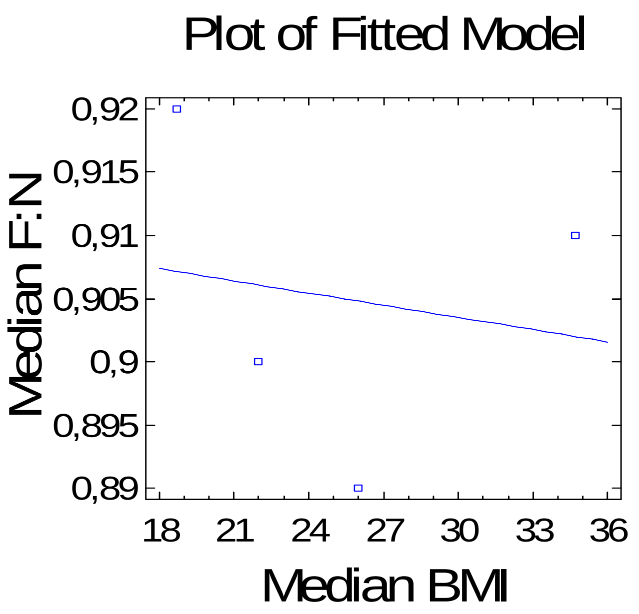
Stnd. skewness = 5,46687

Stnd. kurtosis = 9,92487

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

1.1.3.4.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N

Independent variable: Median BMI

		Standard	T	
Parameter	Estimate	Error	Statistic	P-Value

Intercept	0,913138	0,033893	26,9418	0,0014
Slope	-0,000321027	0,00130122	-0,246712	0,8281

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,0000147673	1	0,0000147673	0,06	0,8281
Residual	0,000485233	2	0,000242616		
Total (Corr.)	0,0005	3			

Correlation Coefficient = -0,171856
R-squared = 2,95345 percent
R-squared (adjusted for d.f.) = -45,5698 percent
Standard Error of Est. = 0,0155761
Mean absolute error = 0,0104334
Durbin-Watson statistic = 1,96654 (P=0,1030)
Lag 1 residual autocorrelation = -0,219796

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

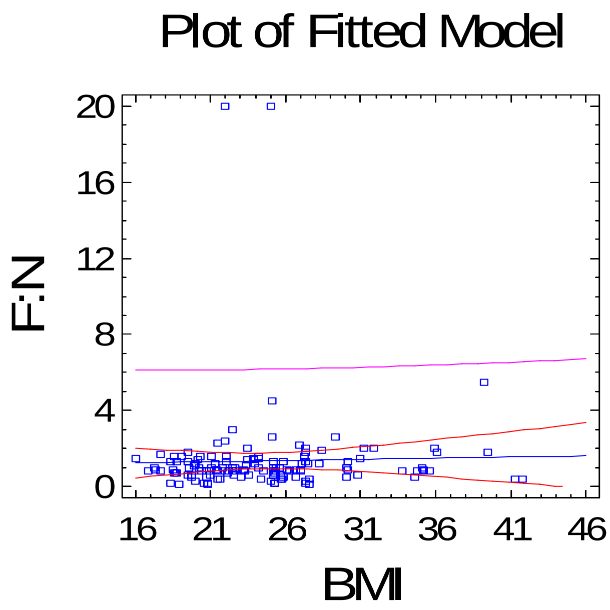
Median F:N = 0,913138 - 0,000321027*Median BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between Median F:N and Median BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 2,95345% of the variability in Median F:N. The correlation coefficient equals -0,171856, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,0155761. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,0104334 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.3.4.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

		Standard	T	
Parameter	Estimate	Error	Statistic	P-Value

Intercept	1,04831	0,997939	1,05048	0,2954
Slope	0,0124609	0,0395809	0,31482	0,7534

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,581326	1	0,581326	0,10	0,7534
Residual	780,092	133	5,86535		
Total (Corr.)	780,673	134			

Correlation Coefficient = 0,0272882

R-squared = 0,0744648 percent

R-squared (adjusted for d.f.) = -0,676855 percent

Standard Error of Est. = 2,42185

Mean absolute error = 0,882162

Durbin-Watson statistic = 2,09525 (P=0,2910)

Lag 1 residual autocorrelation = -0,0479441

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 1,04831 + 0,0124609*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 0,0744648% of the variability in F:N. The correlation coefficient equals 0,0272882, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 2,42185. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,882162 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.3.4.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Reciprocal-X	0,3501	12,26%

S-curve	0,3478	12,09%
Double reciprocal	-0,3454	11,93%
Log probit	-0,2791	7,79%
Logarithmic-X	-0,2607	6,80%
Multiplicative	-0,2583	6,67%
Square root-X	-0,2158	4,66%
Logistic	-0,1947	3,79%
Linear	-0,1719	2,95%
Square root-Y	-0,1706	2,91%
Exponential	-0,1694	2,87%
Reciprocal-Y	0,1670	2,79%

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the reciprocal-X model yields the highest R-Squared value with 12,26%. This is 9,30653% higher than the currently selected linear model. To change models, select the Analysis Options dialog box.

1.1.3.4.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 0,9

Median of sample 2: 0,9

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 22,08

Average rank of sample 2: 25,1905

W = 298,0   P-value = 0,438959

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,285714
Two-sided large sample K-S statistic = 0,965234
Approximate P value = 0,310882

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,285714, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is

not a statistically significant difference between the two
distributions at the 95,0% confidence level.

1.1.3.4.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	5,42742	3	1,80914	0,31	0,8212
Within groups	775,246	131	5,91791		
Total (Corr.)	780,673	134			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,305706, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

	Count	Mean	Homogeneous Groups
ug	25	0,968	X
a	21	1,3	X
ng	49	1,42653	X
üg	40	1,54	X

Contrast	Difference	+/- Limits

----

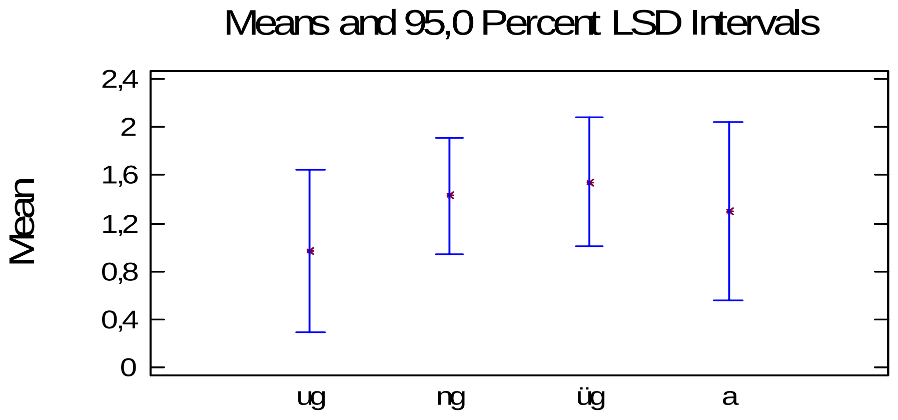
ug - ng	-0,458531	1,1828
ug - üg	-0,572	1,22693
ug - a	-0,332	1,4245
ng - üg	-0,113469	1,02549
ng - a	0,126531	1,25518
üg - a	0,24	1,29685

----

* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.3.4.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 0,9

Median of sample 2: 0,9

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 66,9298

Average rank of sample 2: 73,8095

W = 1319,0   P-value = 0,45933

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	0,0767544	1	0,0767544	0,01	0,9091
Within groups	780,597	133	5,86915		
Total (Corr.)	780,673	134			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,0130776, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 2 variables at the 95,0% confidence level.

1.1.3.4.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

N
F
F:N
Alter
Händer
EWeise

EGew
Krankh
Hunger
BMI
Status

Data input: observations
Number of complete cases: 135
Missing value treatment: listwise
Standardized: yes

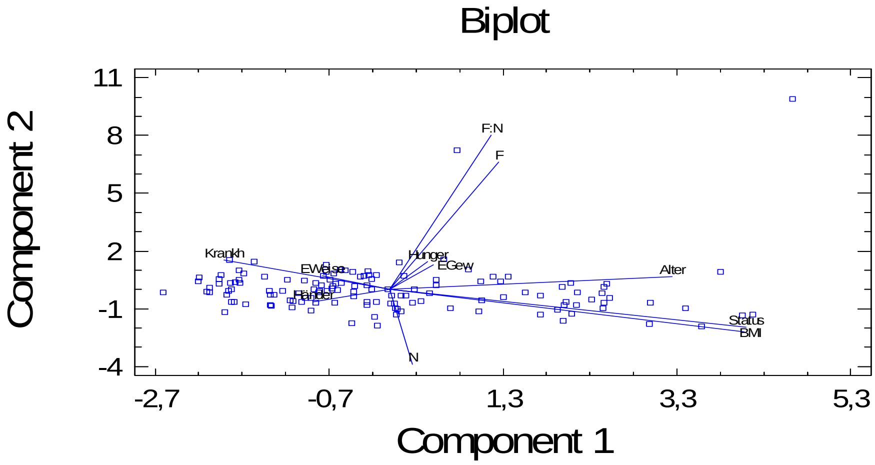
Number of components extracted: 5

Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,51869	22,897	22,897
2	1,72157	15,651	38,548
3	1,27293	11,572	50,120
4	1,15421	10,493	60,613
5	1,03623	9,420	70,033
6	0,896089	8,146	78,179
7	0,804743	7,316	85,495
8	0,741483	6,741	92,236
9	0,529798	4,816	97,052
10	0,242136	2,201	99,254
11	0,0821083	0,746	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 11 variables which account for most of the variability in the data. In this case, 5 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 70,0331% of the variability in the original data.



1.1.3.5 Schnitzel mit Pommes und Salat

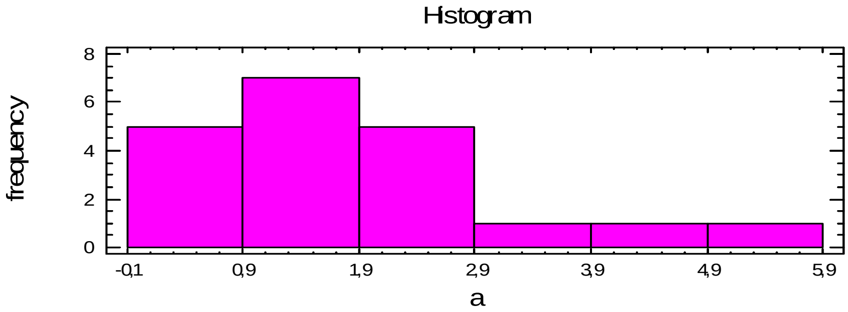
1.1.3.5.1   Prüfung auf Normalverteilung

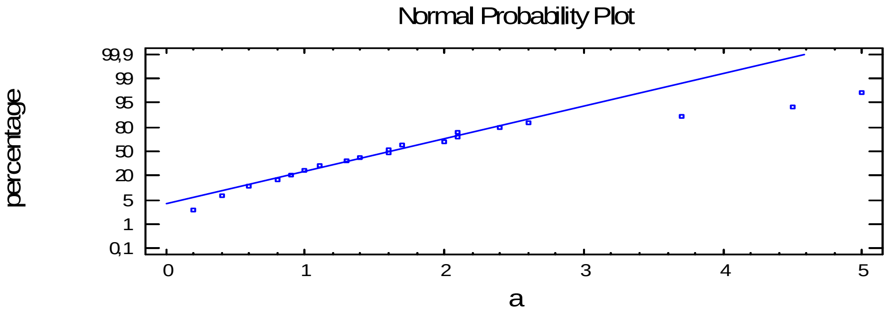
Tabelle 15: Fett – Nichtfett –Verhältnis - Fixation Count der vier Gruppen – Schnitzel mit Pommes und Salat

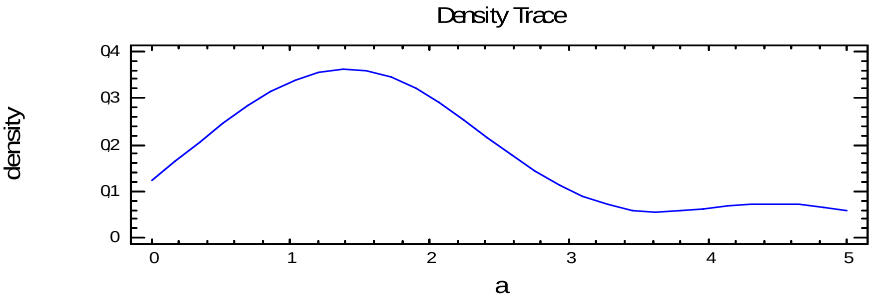
ug	ng	üg	a
2,0	3,7	1,5	1,4
0,5	0,9	0,8	
2,0	0,9	0,8	0,6
1,8	3,0	3,0	4,5
1,9	0,5	1,0	1,6
1,8	1,0	1,8	2,1
1,1	1,4	1,8	0,9
1,1	0,8	3,3	1,1
0,4	2,0	0,5	2,4
2,1	1,0	0,8	5,0
1,4	1,5	1,8	2,1
1,2	1,3	1,7	2,0
1,4	1,6	1,5	3,7
0,1	1,4	1,5	0,8

1,6	0,3	0,9	1,3
2,3	5,3	2,6	1,0
1,5	1,6	1,1	1,6
1,0	1,6	0,8	0,4
2,3	0,7	2,0	0,2
1,6	0,4	1,0	2,6
2,0	1,5	1,9	1,7
1,6	1,3	2,4	
1,3	0,9	1,2	
	2,0	2,3	
	1,2	2,0	
	1,0	1,0	
	1,4	1,1	
	1,7	1,2	
	1,3	1,8	
	0,9	0,6	
	1,1	3,0	
	1,0	4,3	
	0,6	0,8	
	1,3	0,3	
	0,6	1,1	
	1,5	0,6	
	1,9	1,3	
	1,8	1,7	
	1,3	1,3	
	1,1		
	0,9		
	0,9		
	1,5		

	2,4		
	2,8		
	2,0		
	1,0		
	1,0		
	2,3		







Summary Statistics for a

Count = 20

Average = 1,85

Variance = 1,66895

Standard deviation = 1,29188

Minimum = 0,2

Maximum = 5,0

Range = 4,8

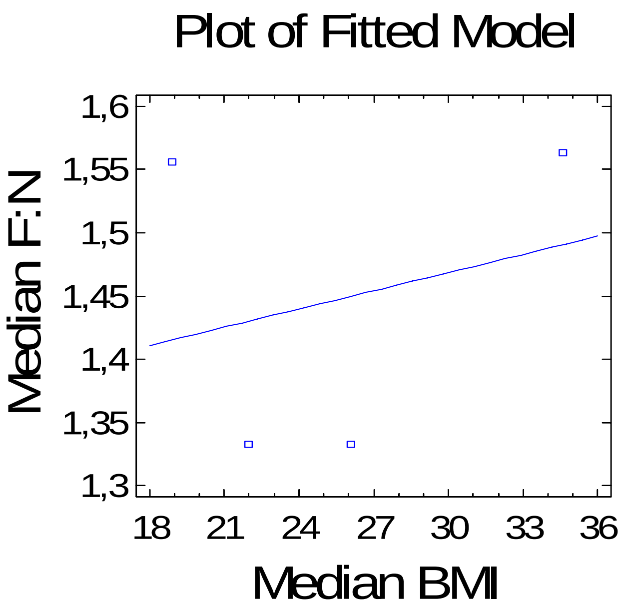
Stnd. skewness = 2,17803

Stnd. kurtosis = 0,964075

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is within the range expected for data from a normal distribution.

1.1.3.5.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N

Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	1,32441	0,343161	3,85943	0,0611
Slope	0,00479703	0,0131606	0,364498	0,7504

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,00319722	1	0,00319722	0,13	0,7504
Residual	0,0481295	2	0,0240648		
Total (Corr.)	0,0513268	3			

Correlation Coefficient = 0,249583

R-squared = 6,22916 percent

R-squared (adjusted for d.f.) = -40,6563 percent

Standard Error of Est. = 0,155128

Mean absolute error = 0,106774

Durbin-Watson statistic = 1,92762 (P=0,0920)

Lag 1 residual autocorrelation = -0,224926

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

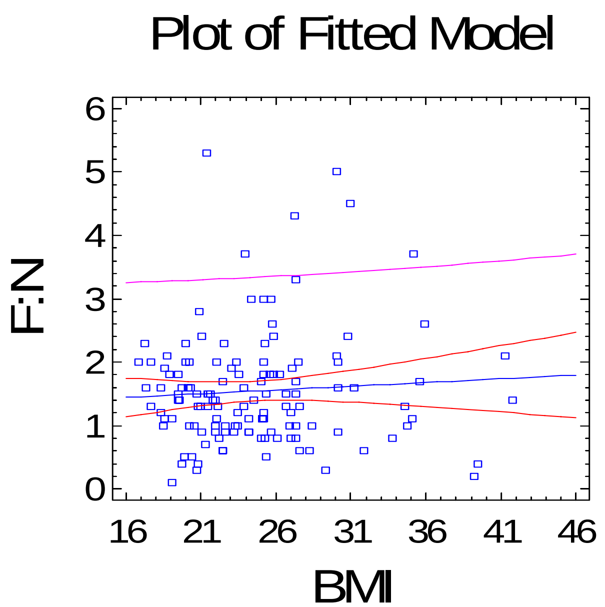
Median F:N = 1,32441 + 0,00479703*Median BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between Median F:N and Median BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 6,22916% of the variability in Median F:N. The correlation coefficient equals 0,249583, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,155128. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,106774 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.3.5.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	1,25258	0,388678	3,22266	0,0016
Slope	0,0118071	0,0154454	0,76444	0,4460

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,476669	1	0,476669	0,58	0,4460
Residual	105,225	129	0,8157		
Total (Corr.)	105,702	130			

Correlation Coefficient = 0,0671532

R-squared = 0,450956 percent

R-squared (adjusted for d.f.) = -0,320742 percent

Standard Error of Est. = 0,903161

Mean absolute error = 0,641989

Durbin-Watson statistic = 1,9961 (P=0,4912)

Lag 1 residual autocorrelation = -0,0203227

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 1,25258 + 0,0118071*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 0,450956% of the variability in F:N. The correlation coefficient equals 0,0671532, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,903161. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,641989 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.3.5.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Linear	0,2496	6,23%
Square root-Y	0,2488	6,19%
Exponential	0,2481	6,15%
Reciprocal-Y	-0,2466	6,08%
Square root-X	0,2085	4,35%
Logarithmic-X	0,1656	2,74%
Multiplicative	0,1640	2,69%
Reciprocal-X	-0,0761	0,58%
S-curve	-0,0745	0,56%
Double reciprocal	0,0730	0,53%
Logistic	<no fit>	
Log probit	<no fit>	

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the linear model yields the highest R-Squared value with 6,22916%. This is the currently selected model.

1.1.3.5.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 1,6

Median of sample 2: 1,6

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 21,1304

Average rank of sample 2: 23,0

W = 250,0   P-value = 0,634317

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,269565
Two-sided large sample K-S statistic = 0,881675
Approximate P value = 0,424496

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,269565, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.3.5.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	2,39605	3	0,798682	0,98	0,4036
Within groups	103,306	127	0,813433		
Total (Corr.)	105,702	130			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,981866, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

	Count	Mean	Homogeneous Groups
ng	49	1,45102	X
ug	23	1,47826	X

üg	39	1,54103	X
a	20	1,85	X

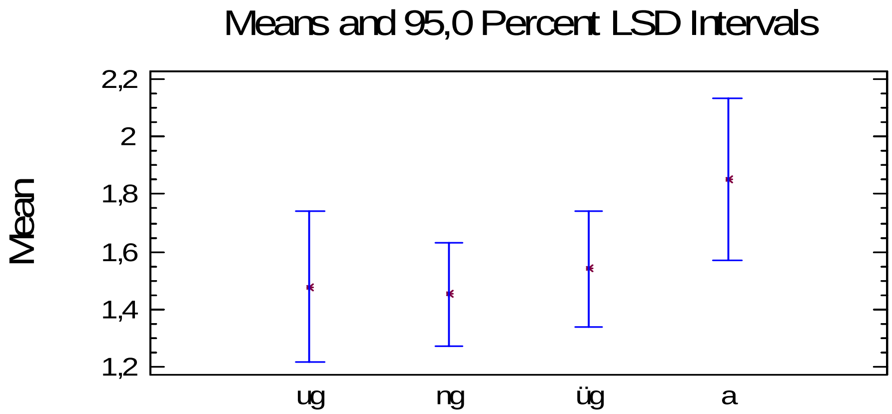
Contrast	Difference	+/- Limits
ug - ng	0,0272405	0,451099
ug - üg	-0,0627648	0,46921
ug - a	-0,371739	0,545661
ng - üg	-0,0900052	0,382982
ng - a	-0,39898	0,473565
üg - a	-0,308974	0,490847

----

* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.3.5.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

ANOVA Table

Comparison of Medians

Median of sample 1: 1,4

Median of sample 2: 1,6

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 64,6126

Average rank of sample 2: 73,7

W = 1264,0   P-value = 0,325301

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	2,21721	1	2,21721	2,76	0,0988
Within groups	103,485	129	0,802208		
Total (Corr.)	105,702	130			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 2,76389, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a

statistically significant difference between the means of the 2

variables at the 95,0% confidence level.

1.1.3.5.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

F_Schnitzel
F_Pommes
N
F:N
Alter
Händer
EWeise
EGew
Krankh
Hunger
BMI
Status

Data input: observations
Number of complete cases: 131
Missing value treatment: listwise
Standardized: yes

Number of components extracted: 5

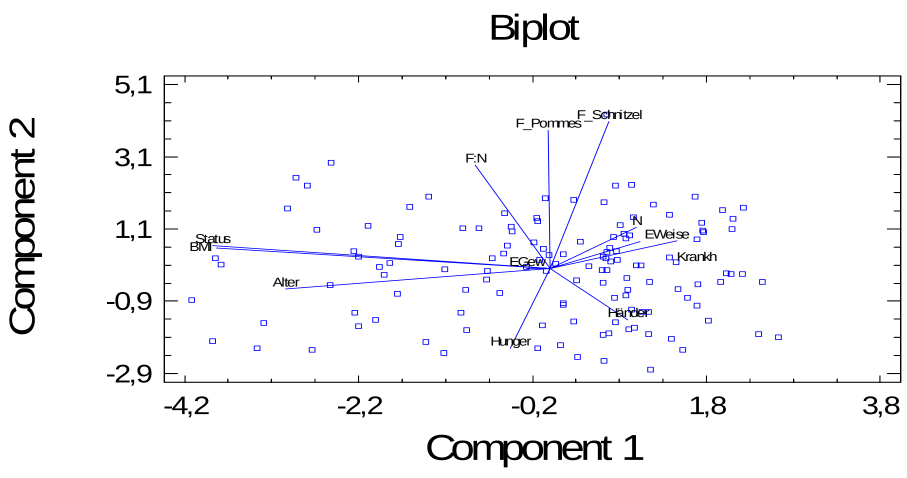
Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,48575	20,715	20,715
2	1,82129	15,177	35,892
3	1,66217	13,851	49,743
4	1,20852	10,071	59,814
5	1,03934	8,661	68,476

6	0,965847	8,049	76,524
7	0,801752	6,681	83,206
8	0,729392	6,078	89,284
9	0,588311	4,903	94,186
10	0,488137	4,068	98,254
11	0,126234	1,052	99,306
12	0,0832589	0,694	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 12 variables which account for most of the variability in the data. In this case, 5 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 68,4756% of the variability in the original data.



1.1.4 Observation Length

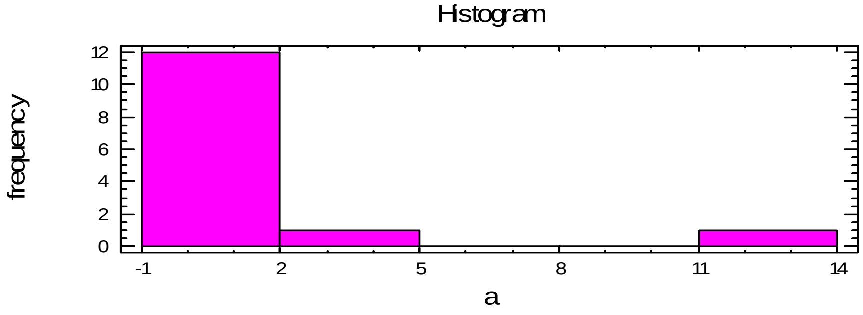
1.1.4.1 Hamburger und Birne

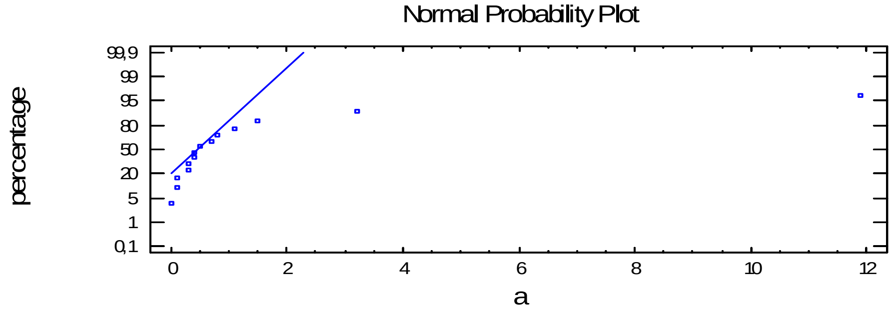
1.1.4.1.1 Prüfung auf Normalverteilung

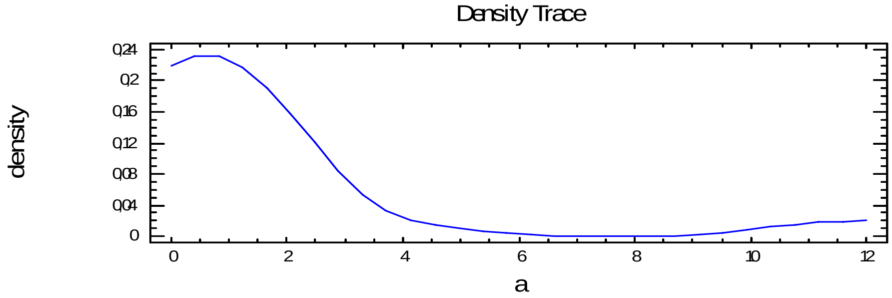
Tabelle 16: Fett – Nichtfett –Verhältnis – Observation Length [s] der vier Gruppen - Hamburger und Birne

ug	ng	üg	a
0,0	0,3	0,1	0,1
0,2	0,1	0,0	0,3
0,0	0,8	0,2	0,0
1,1	0,1	0,3	3,2
0,0	0,1	0,3	0,1
0,2	0,0	0,0	0,1
0,6	0,0	0,3	0,5
0,0	0,3	0,2	0,0
0,0	0,3	0,0	0,4
0,1	0,2	0,0	11,9
0,1	0,0	0,1	0,0
0,1	0,1	2,1	0,8
0,1	0,2	1,4	0,7
0,4	0,6	0,3	0,4
2,4	0,1	0,7	1,5
0,0	0,9	0,3	0,2
0,2	0,0	0,5	0,1
0,1	2,1	0,4	1,1
0,2	0,2	0,0	0,3
0,4	0,2	0,2	
0,0	0,0	0,0	0,3
0,2	0,4	0,3	0,4
	0,3	0,4	

	5,8	1,1	
	1,0	0,1	
	0,6	1,0	
	0,2	0,8	
	0,0	1,3	
	5,1	0,0	
	0,1	0,4	
	0,8	0,0	
	0,2	0,1	
	0,0	3,4	
	0,1	0,1	
	0,1	0,3	
	0,4	2,0	
	1,3	0,2	
	12,3	0,1	
	3,0	0,3	
	2,2	1,4	
	0,3	0,0	
	2,0		
	0,1		
	0,2		
	0,5		
	0,8		







Summary Statistics for a

Count = 14

Average = 1,52143

Variance = 9,60027

Standard deviation = 3,09843

Minimum = 0,0

Maximum = 11,9

Range = 11,9

Stnd. skewness = 5,0918

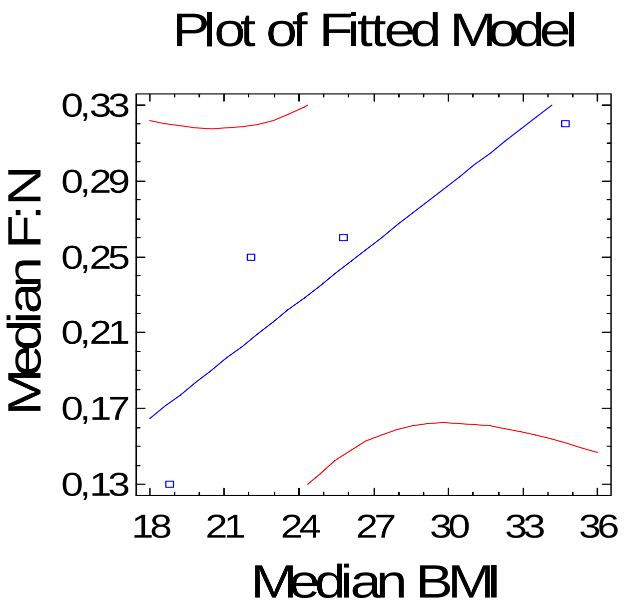
Stnd. kurtosis = 8,86421

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized

skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

1.1.4.1.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N

Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	-0,0196268	0,100457	-0,195375	0,8631
Slope	0,0102417	0,00385834	2,65443	0,1174

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,0147992	1	0,0147992	7,05	0,1174
Residual	0,00420076	2	0,00210038		

Total (Corr.)   0,019   3

Correlation Coefficient = 0,882557
R-squared = 77,8907 percent
R-squared (adjusted for d.f.) = 66,8361 percent
Standard Error of Est. = 0,0458299
Mean absolute error = 0,0293384
Durbin-Watson statistic = 2,18516 (P=0,0642)
Lag 1 residual autocorrelation = -0,341373

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

Median F:N = -0,0196268 + 0,0102417*Median BMI

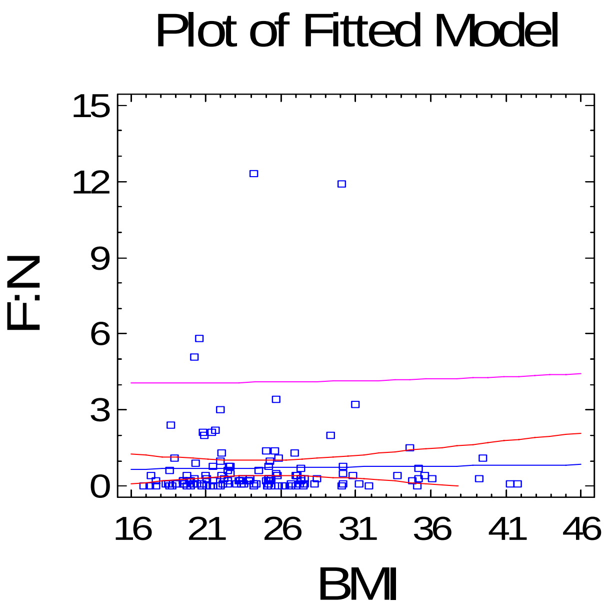
Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between Median F:N and Median BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 77,8907% of the variability in Median F:N. The correlation coefficient equals 0,882557, indicating a moderately strong relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,0458299. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,0293384 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in

the residuals.

1.1.4.1.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	0,576552	0,728894	0,790995	0,4304
Slope	0,00587796	0,0287747	0,204275	0,8385

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,120225	1	0,120225	0,04	0,8385
Residual	368,785	128	2,88113		
Total (Corr.)	368,905	129			

Correlation Coefficient = 0,0180526

R-squared = 0,0325896 percent

R-squared (adjusted for d.f.) = -0,748406 percent

Standard Error of Est. = 1,69739

Mean absolute error = 0,825879

Durbin-Watson statistic = 1,99089 (P=0,4794)

Lag 1 residual autocorrelation = 0,00411898

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 0,576552 + 0,00587796*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 0,0325896% of the variability in F:N. The correlation coefficient equals 0,0180526, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 1,69739. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,825879 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.4.1.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Reciprocal-X	-0,9414	88,62%
Logarithmic-X	0,9145	83,63%
S-curve	-0,9019	81,34%
Square root-X	0,8990	80,81%
Log probit	0,8869	78,66%
Linear	0,8826	77,89%
Multiplicative	0,8648	74,79%
Double reciprocal	0,8606	74,07%
Square root-Y	0,8534	72,84%
Logistic	0,8411	70,74%
Exponential	0,8237	67,85%
Reciprocal-Y	-0,7678	58,95%

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the reciprocal-X model yields the highest R-Squared value with 88,6225%. This is 10,7317% higher than the currently selected linear model. To change models, select the Analysis Options dialog box.

1.1.4.1.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 0,1

Median of sample 2: 0,3

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

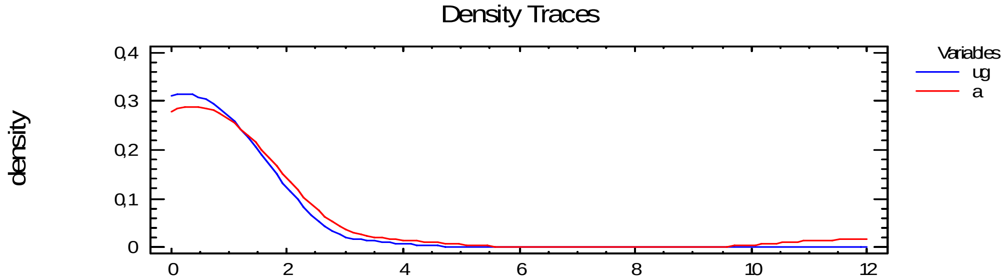
Average rank of sample 1: 18,2955

Average rank of sample 2: 25,881

W = 312,5   P-value = 0,0461343

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is less than 0,05, there is a statistically significant difference between the medians at the 95,0% confidence level.



Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,439394

Two-sided large sample K-S statistic = 1,44026

Approximate P value = 0,03157

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,439394, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is less than 0,05, there is a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.4.1.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	11,2371	3	3,7457	1,32	0,2710
Within groups	357,668	126	2,83864		
Total (Corr.)	368,905	129			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 1,31954, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

	Count	Mean	Homogeneous Groups
ug	22	0,290909	X
üg	41	0,504878	X
ng	46	0,965217	X
a	21	1,06667	X

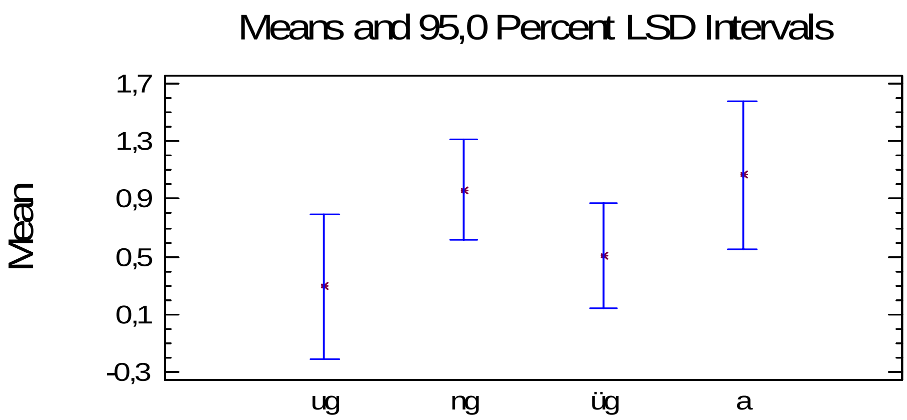
Contrast	Difference	+/- Limits
ug - ng	-0,674308	0,86429
ug - üg	-0,213969	0,881175
ug - a	-0,775758	1,0172
ng - üg	0,460339	0,716117
ng - a	-0,101449	0,8781

üg - a	-0,561789	0,894725

----
* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.4.1.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 0,2

Median of sample 2: 0,3

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 64,1101

Average rank of sample 2: 72,7143

W = 1296,0   P-value = 0,334847

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	2,97002	1	2,97002	1,04	0,3100

Within groups	365,935	128	2,85887

Total (Corr.)	368,905	129

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 1,03888, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 2 variables at the 95,0% confidence level.

1.1.4.1.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

Hamb
Birne
Hamb:Birne
F
N
F:N
Alter
Händer
EWeise
EGew
Krankh
Hunger
BMI

Status

Data input: observations
Number of complete cases: 129
Missing value treatment: listwise
Standardized: yes

Number of components extracted: 4

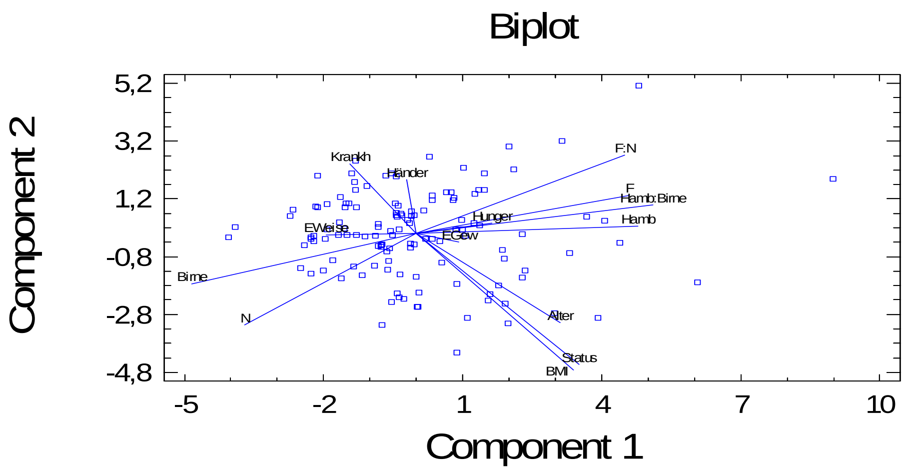
Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	3,66884	26,206	26,206
2	2,27335	16,238	42,444
3	1,33882	9,563	52,007
4	1,16911	8,351	60,358
5	0,960314	6,859	67,217
6	0,936943	6,692	73,910
7	0,876631	6,262	80,171
8	0,779054	5,565	85,736
9	0,638435	4,560	90,296
10	0,571643	4,083	94,380
11	0,400257	2,859	97,239
12	0,179743	1,284	98,522
13	0,12115	0,865	99,388
14	0,0857153	0,612	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 14 variables which account for most of the variability in the data. In this case, 4 components have been extracted, since 2090115364 components had eigenvalues greater than or

equal to 1,0. Together they account for 60,358% of the variability in the original data.



1.1.4.2 Praline und Erdbeere

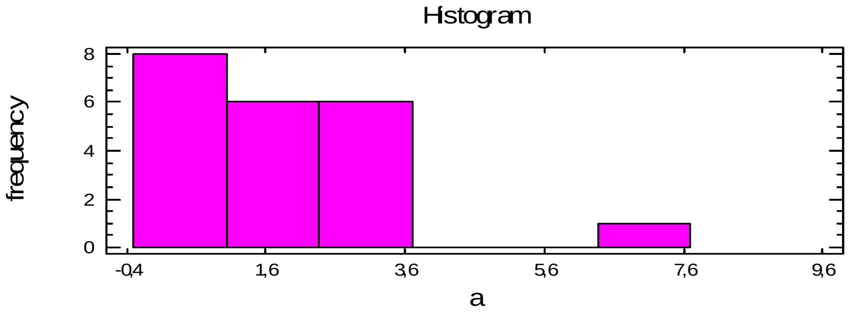
1.1.4.2.1 Prüfung auf Normalverteilung

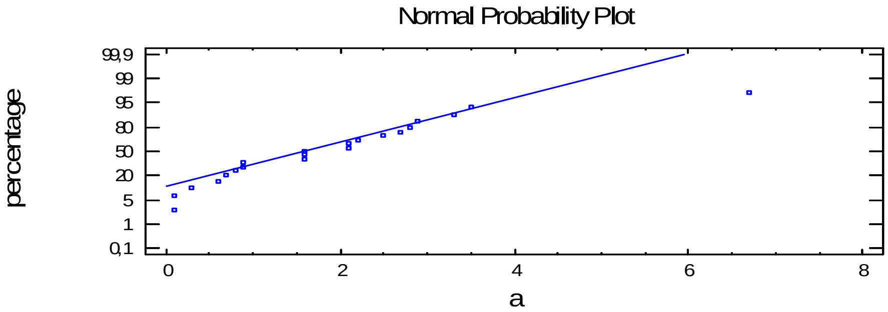
Tabelle 17: Fett – Nichtfett –Verhältnis – Observation Length [s] der vier Gruppen - Praline und Erdbeere

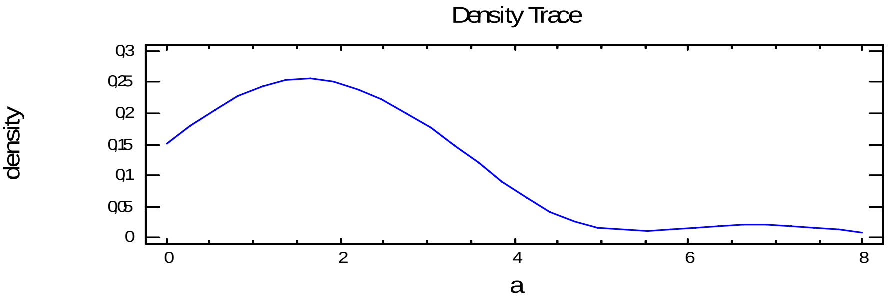
ug	ng	üg	a
2,3	0,8	2,5	1,6
0,4	1,7	0,8	0,8
1,1	0,6	2,9	1,6
0,7	2,2	1,0	0,3
1,7	9,4	3,4	2,1
1,4	1,1	0,8	3,3
1,0	1,1	1,5	1,6
0,9	2,6	2,5	2,5
3,5	1,6	0,2	2,8
1,1	2,3	1,1	2,2
5,3	0,7	1,2	2,9
1,2	1,4	3,5	0,9
0,5	3,3	1,4	6,7
0,4	1,3	0,7	0,9

1,0	1,2	1,0	2,7
2,2	0,6	2,2	2,1
0,4	4,7	0,3	0,7
0,2	3,5	1,4	0,1
0,4	0,7	1,5	0,1
2,7	3,6	1,3	3,5
1,3	2,0	0,6	0,6
0,7	1,0	1,4	
1,7	1,0	1,3	
	2,2	1,1	
	0,5	0,8	
	1,1	4,3	
	0,6	0,9	
	1,7	2,4	
	1,1	0,8	
	1,1	0,6	
	0,9	1,2	
	0,9	0,9	
	0,3	0,3	
	0,4	0,8	
	1,1	1,1	
	1,2	0,5	
	4,5	0,3	
	0,9	1,1	
	1,1	1,5	
	0,6		
	1,2		
	0,8		
	2,1		

	3,6		
	1,3		
	1,8		
	1,1		
	0,8		
	1,5		







Summary Statistics for a

Count = 21

Average = 1,90476

Variance = 2,30948

Standard deviation = 1,5197

Minimum = 0,1

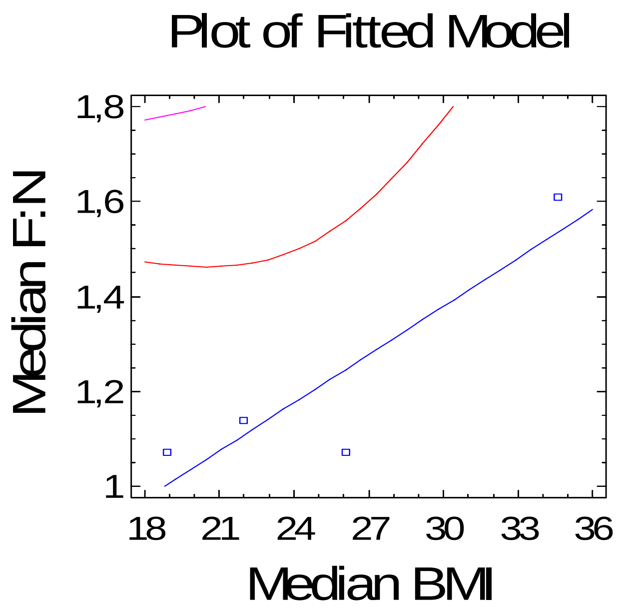
Maximum = 6,7

Range = 6,6
Stnd. skewness = 2,8331
Stnd. kurtosis = 3,55962

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

1.1.4.2.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N
Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	0,362915	0,320376	1,13278	0,3748
Slope	0,0338715	0,0122868	2,75673	0,1102

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,159402	1	0,159402	7,60	0,1102
Residual	0,0419503	2	0,0209751		
Total (Corr.)	0,201353	3			

Correlation Coefficient = 0,889751

R-squared = 79,1658 percent

R-squared (adjusted for d.f.) = 68,7487 percent

Standard Error of Est. = 0,144828

Mean absolute error = 0,08748

Durbin-Watson statistic = 2,52565 (P=0,0163)

Lag 1 residual autocorrelation = -0,386589

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

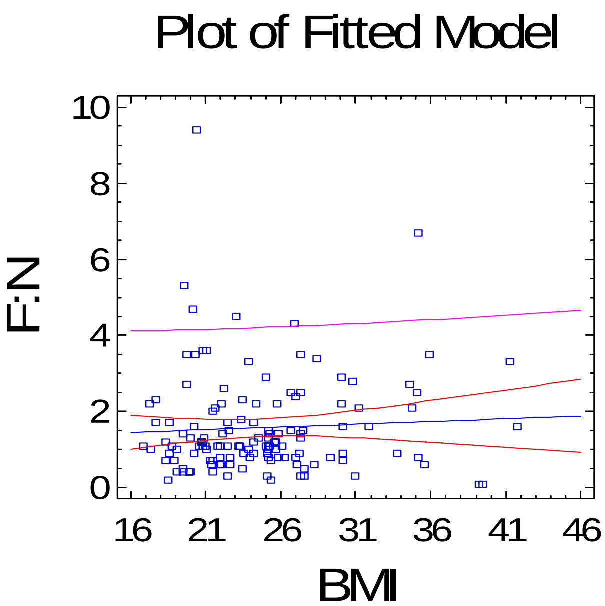
Median F:N = 0,362915 + 0,0338715*Median BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between Median F:N and Median BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 79,1658% of the variability in Median F:N. The correlation coefficient equals 0,889751, indicating a moderately strong relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,144828. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,08748 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation. Plot the residuals versus row order to see if there is any pattern which can be seen.

1.1.4.2.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	1,22126	0,563179	2,16851	0,0319
Slope	0,0143402	0,0222995	0,643075	0,5213

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,725731	1	0,725731	0,41	0,5213
Residual	228,137	130	1,7549		
Total (Corr.)	228,862	131			

Correlation Coefficient = 0,0563119

R-squared = 0,317103 percent

R-squared (adjusted for d.f.) = -0,449688 percent

Standard Error of Est. = 1,32473

Mean absolute error = 0,912445

Durbin-Watson statistic = 1,63514 (P=0,0178)

Lag 1 residual autocorrelation = 0,178343

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 1,22126 + 0,0143402*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 0,317103% of the variability in F:N. The correlation coefficient equals 0,0563119, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 1,32473. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,912445 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation.
Plot the residuals versus row order to see if there is any pattern which can be seen.

1.1.4.2.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Linear	0,8898	79,17%
Square root-Y	0,8879	78,83%
Exponential	0,8858	78,46%
Reciprocal-Y	-0,8807	77,56%
Square root-X	0,8717	75,99%
Logarithmic-X	0,8518	72,56%
Multiplicative	0,8484	71,97%
Reciprocal-X	-0,8073	65,17%
S-curve	-0,8045	64,73%
Double reciprocal	0,8009	64,15%
Logistic	<no fit>	
Log probit	<no fit>	

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the linear model yields the highest R-Squared value with 79,1658%. This is the currently selected model.

1.1.4.2.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 1,1

Median of sample 2: 1,6

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 20,413

Average rank of sample 2: 24,7857

W = 289,5   P-value = 0,263871

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,3147
Two-sided large sample K-S statistic = 1,04266
Approximate P value = 0,227545

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,3147, which you can see visually by selecting Quantile Plot from the list of Graphical

Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.4.2.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	5,44613	3	1,81538	1,04	0,3772
Within groups	223,416	128	1,74544		
Total (Corr.)	228,862	131			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 1,04007, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

	Count	Mean	Homogeneous Groups
üg	39	1,36154	X
ug	23	1,39565	X
ng	49	1,6898	X
a	21	1,90476	X

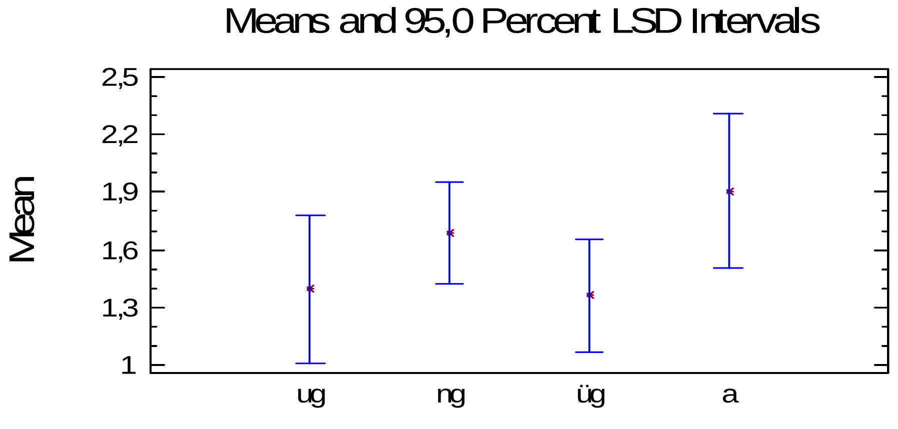
Contrast	Difference	+/- Limits
ug - ng	-0,294144	0,660741
ug - üg	0,0341137	0,687269
ug - a	-0,50911	0,789005
ng - üg	0,328257	0,560968
ng - a	-0,214966	0,681818
üg - a	-0,543223	0,707556

----

* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.4.2.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 1,1

Median of sample 2: 1,6

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 64,8739

Average rank of sample 2: 75,0952

W = 1346,0   P-value = 0,26216

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	2,70317	1	2,70317	1,55	0,2148
Within groups	226,159	130	1,73969		
Total (Corr.)	228,862	131			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 1,55383, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 2 variables at the 95,0% confidence level.

1.1.4.2.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

F
N
F:N
Alter
Händer

EWeise
EGew
Krankh
Hunger
BMI
Status

Data input: observations
Number of complete cases: 132
Missing value treatment: listwise
Standardized: yes

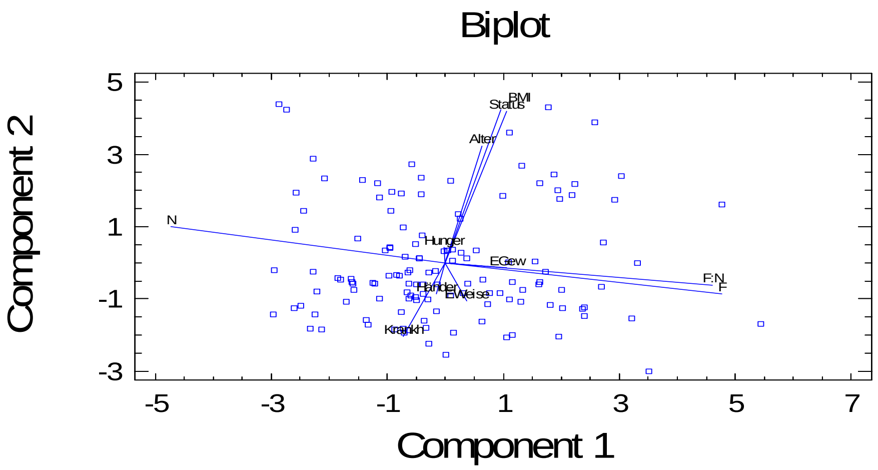
Number of components extracted: 4

Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,7771	25,246	25,246
2	2,46424	22,402	47,649
3	1,17433	10,676	58,324
4	1,10988	10,090	68,414
5	0,964638	8,769	77,184
6	0,868729	7,898	85,081
7	0,795015	7,227	92,309
8	0,49655	4,514	96,823
9	0,205191	1,865	98,688
10	0,081909	0,745	99,433
11	0,0624141	0,567	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 11 variables which account for most of the variability in the data. In this case, 4 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 68,4141% of the variability in the original data.



1.1.4.3 Chips und Weintrauben

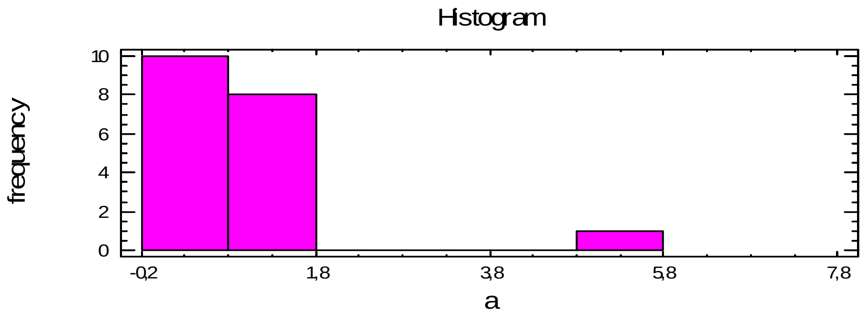
1.1.4.3.1 Prüfung auf Normalverteilung

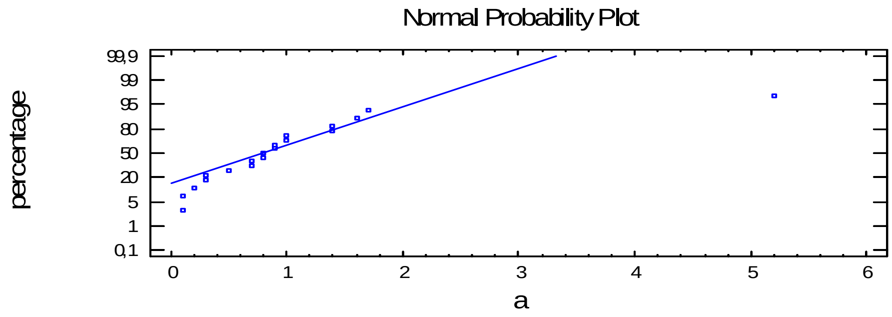
Tabelle 18: Fett – Nichtfett –Verhältnis – Observation Length [s] der vier Gruppen - Chips und Weintrauben

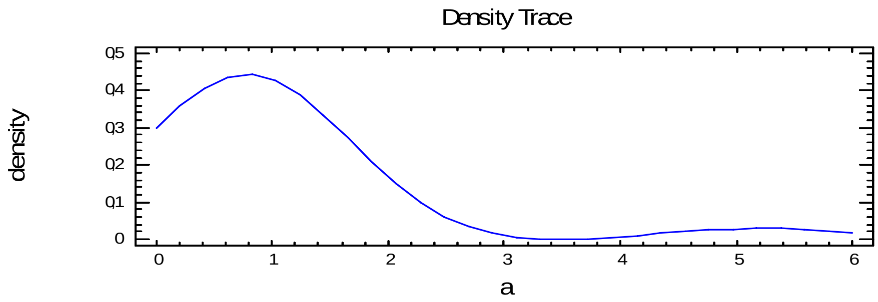
ug	ng	üg	a
1,0	0,4	0,3	5,2
0,5	0,6	1,8	0,5
1,0	0,3	1,2	0,7
0,4	2,9	1,2	0,8
0,9	0,4	1,1	1,4
2,3	0,7	0,5	1,7
0,8	0,7	2,6	0,9
5,1	0,5	4,8	0,8
0,6	1,6	0,6	1,4
1,3	0,7	0,7	0,3
0,9	0,6	1,6	1,6
0,3	7,0	2,8	0,1
1,7	1,5	0,9	1,0

0,1	1,0	0,4	0,3
0,8	1,6	0,9	0,7
1,1	1,5	0,3	0,9
0,8	0,9	0,9	0,2
0,4	25,7	0,7	0,1
1,2	1,0	1,1	1,0
	1,1	0,4	1,9
	0,7	0,6	0,8
	1,1	0,8	
	0,7	0,8	
	0,6	0,9	
	1,5	0,5	
	0,5	0,2	
	0,4	0,7	
	0,0	0,8	
	0,4	0,7	
	0,7	0,3	
	4,7	1,5	
	0,7	2,3	
	1,4	0,7	
	0,7	0,5	
	0,6	0,7	
	0,6	0,5	
	0,8	0,6	
	1,2	1,5	
	0,6	1,3	
	0,6		
	0,8		
	1,4		

	0,0		
	0,3		
	1,3		
	1,2		
	3,1		
	1,1		
	2,1		
	1,4		
	1,2		







Summary Statistics for a

Count = 19

Average = 1,03158

Variance = 1,25339

Standard deviation = 1,11955

Minimum = 0,1

Maximum = 5,2

Range = 5,1

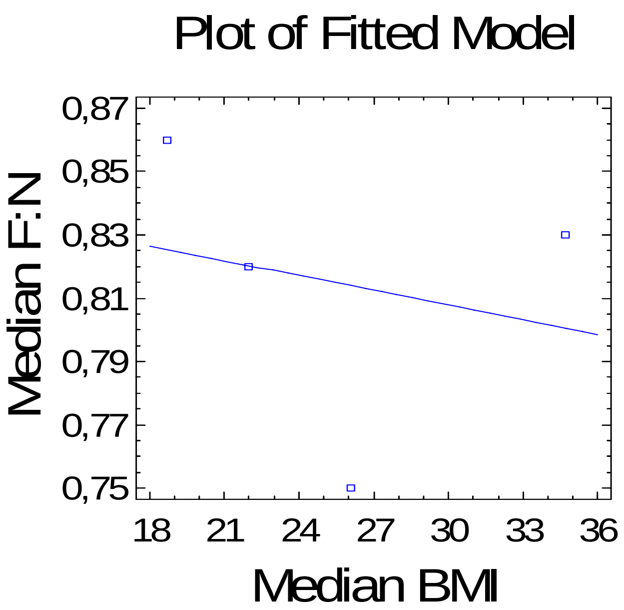
Stnd. skewness = 5,49489

Stnd. kurtosis = 10,2244

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

1.1.4.3.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N

Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	0,854718	0,120707	7,08096	0,0194
Slope	-0,00156525	0,00462974	-0,338086	0,7675

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,000351399	1	0,000351399	0,11	0,7675
Residual	0,0061486	2	0,0030743		
Total (Corr.)	0,0065	3			

Correlation Coefficient = -0,232511

R-squared = 5,40614 percent

R-squared (adjusted for d.f.) = -41,8908 percent

Standard Error of Est. = 0,0554464

Mean absolute error = 0,032074

Durbin-Watson statistic = 2,27551 (P=0,0449)

Lag 1 residual autocorrelation = -0,306064

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

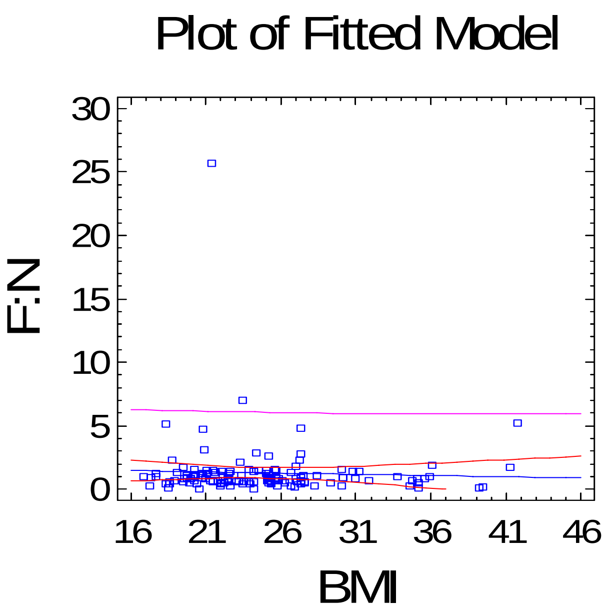
Median F:N = 0,854718 - 0,00156525*Median BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between Median F:N and Median BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 5,40614% of the variability in Median F:N. The correlation coefficient equals -0,232511, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,0554464. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,032074 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation. Plot the residuals versus row order to see if there is any pattern which can be seen.

1.1.4.3.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	1,7743	1,02209	1,73595	0,0850
Slope	-0,0196135	0,0402474	-0,487325	0,6269

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	1,37247	1	1,37247	0,24	0,6269
Residual	739,735	128	5,77918		
Total (Corr.)	741,108	129			

Correlation Coefficient = -0,0430339

R-squared = 0,185192 percent

R-squared (adjusted for d.f.) = -0,594611 percent

Standard Error of Est. = 2,40399

Mean absolute error = 0,910588

Durbin-Watson statistic = 2,00485 (P=0,4890)

Lag 1 residual autocorrelation = -0,00303114

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 1,7743 - 0,0196135*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 0,185192% of the variability in F:N. The correlation coefficient equals -0,0430339, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 2,40399. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,910588 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is

greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.4.3.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Reciprocal-X	0,3930	15,44%
S-curve	0,3830	14,67%
Double reciprocal	-0,3733	13,94%
Log probit	-0,3419	11,69%
Logarithmic-X	-0,3140	9,86%
Multiplicative	-0,3045	9,27%
Square root-X	-0,2732	7,47%
Logistic	-0,2665	7,10%
Linear	-0,2325	5,41%
Square root-Y	-0,2279	5,19%
Exponential	-0,2233	4,99%
Reciprocal-Y	0,2144	4,60%

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the reciprocal-X model yields the highest R-Squared value with 15,4415%. This is 10,0354% higher than the currently selected linear model. To change models, select the Analysis Options dialog box.

1.1.4.3.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 0,9

Median of sample 2: 0,8

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 21,0789

Average rank of sample 2: 19,9762

W = 188,5   P-value = 0,775416

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,20802

Two-sided large sample K-S statistic = 0,656994

Approximate P value = 0,7811

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,20802, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.4.3.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	9,9112	3	3,30373	0,57	0,6362
Within groups	731,197	126	5,80315		
Total (Corr.)	741,108	129			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,5693, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

	Count	Mean	Homogeneous Groups
üg	39	1,04359	X
a	21	1,0619	X
ug	19	1,11579	X
ng	51	1,62941	X

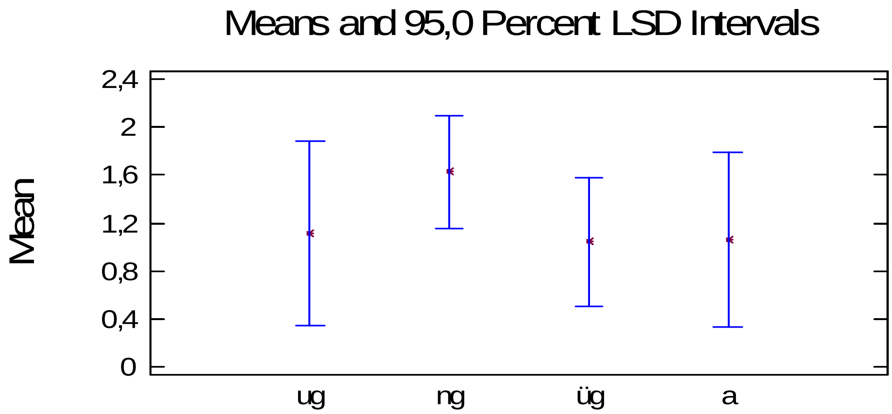
Contrast	Difference	+/- Limits
ug - ng	-0,513622	1,28132
ug - üg	0,0721997	1,33376
ug - a	0,0538847	1,50944
ng - üg	0,585822	1,01409
ng - a	0,567507	1,23607
üg - a	-0,018315	1,29034

----

* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.4.3.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 0,8

Median of sample 2: 0,8

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 65,789

Average rank of sample 2: 64,0

W = 1113,0   P-value = 0,844173

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	1,26815	1	1,26815	0,22	0,6403
Within groups	739,84	128	5,78		
Total (Corr.)	741,108	129			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,219404, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a

statistically significant difference between the means of the 2 variables at the 95,0% confidence level.

1.1.4.3.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

F
N
F:N
Alter
Händer
EWeise
EGew
Krankh
Hunger
BMI
Status

Data input: observations
Number of complete cases: 130
Missing value treatment: listwise
Standardized: yes

Number of components extracted: 4

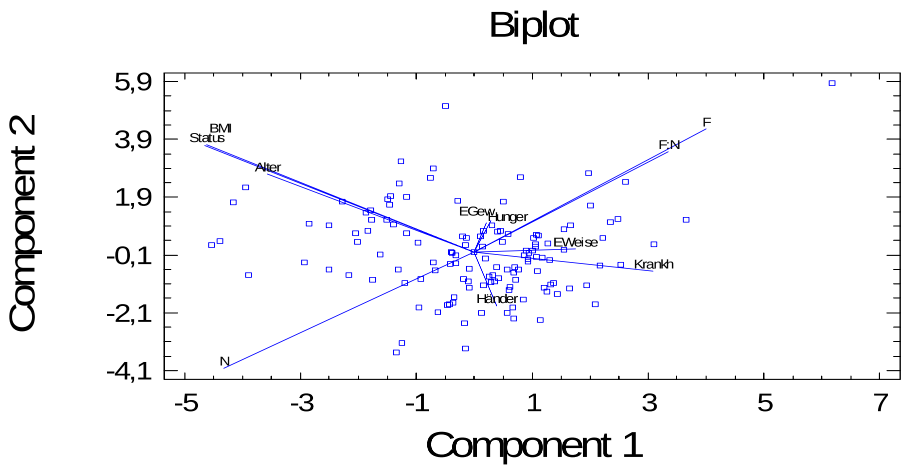
Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,64957	24,087	24,087
2	2,22994	20,272	44,359
3	1,18226	10,748	55,107
4	1,10447	10,041	65,148
5	0,920187	8,365	73,513
6	0,863021	7,846	81,359

7	0,786061	7,146	88,505
8	0,527384	4,794	93,299
9	0,502635	4,569	97,868
10	0,147005	1,336	99,205
11	0,0874604	0,795	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 11 variables which account for most of the variability in the data. In this case, 4 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 65,1477% of the variability in the original data.



1.1.4.4 Bananen und Schokolade

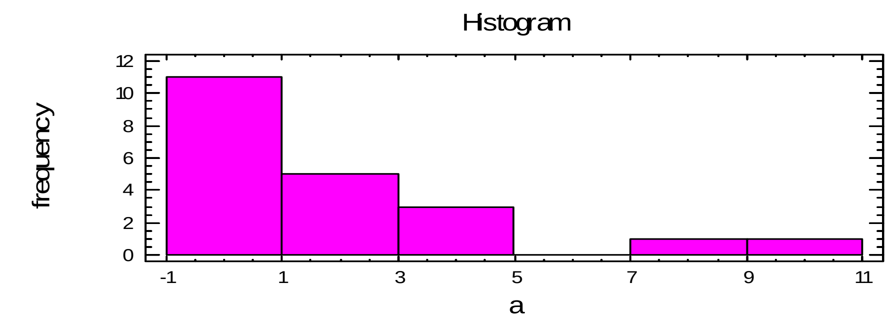
1.1.4.4.1 Prüfung auf Normalverteilung

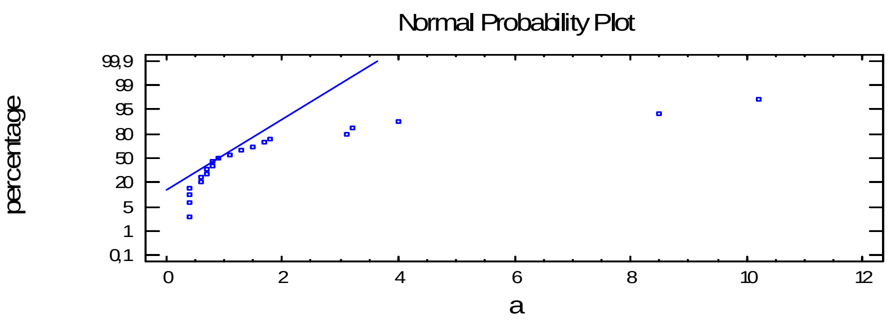
Tabelle 19: Fett – Nichtfett –Verhältnis – Observation Length [s] der vier Gruppen - Bananen und Schokolade

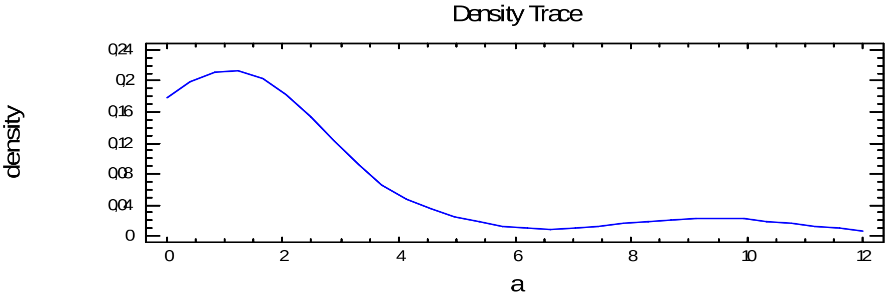
ug	ng	üg	a
0,6	1,5	1,5	0,4
0,8	1,0	1,3	1,1
2,9	0,2	0,2	0,8

1,0	0,2	0,9	1,7
0,2	0,4	2,0	3,1
1,1	1,1	0,7	0,4
0,2	1,4	1,9	1,5
1,7	1,0	0,5	0,6
0,7	0,8	1,1	0,7
1,3	2,9	1,0	0,8
2,6	0,5	0,8	0,4
1,2	0,6	1,5	3,2
0,6	2,6	3,1	0,9
1,0	0,8	0,7	0,7
1,2	0,7	0,2	0,4
0,1	1,0	0,4	1,3
1,3	1,2	1,6	4,0
1,4	1,5	0,2	10,2
0,7	1,4	0,8	8,5
1,0	0,2	0,4	1,8
1,8	0,7	1,0	0,6
1,2	1,5	0,9	
0,2	1,2	0,6	
0,1	1,4	0,7	
0,8	1,3	1,4	
	0,3	3,7	
	3,7	0,2	
	1,1	5,0	
	0,7	0,8	
	1,3	0,8	
	1,8	0,9	
	0,9	0,3	

	3,1	1,6	
	6,5	0,1	
	4,2	2,0	
	0,7	0,8	
	0,5	0,3	
	0,7	0,4	
	0,3	26,8	
	2,5	0,5	
	4,9		
	4,3		
	0,4		
	0,7		
	0,6		
	1,0		
	0,9		
	1,0		
	0,7		







Summary Statistics for a

Count = 21

Average = 2,05238

Variance = 6,96962

Standard deviation = 2,64

Minimum = 0,4

Maximum = 10,2

Range = 9,8

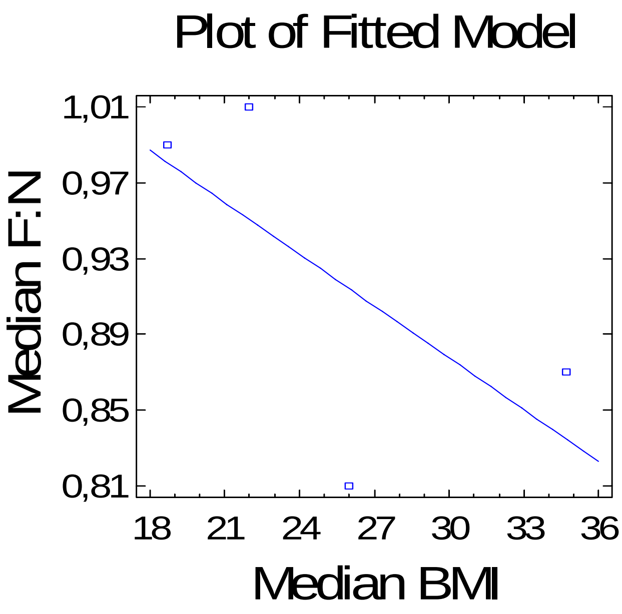
Stnd. skewness = 4,39886

Stnd. kurtosis = 4,78948

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

1.1.4.4.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N

Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	1,15105	0,192769	5,97113	0,0269
Slope	-0,00911438	0,00740082	-1,23154	0,3433

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,0119034	1	0,0119034	1,52	0,3433
Residual	0,0156966	2	0,00784831		
Total (Corr.)	0,0276	3			

Correlation Coefficient = -0,656721

R-squared = 43,1282 percent

R-squared (adjusted for d.f.) = 14,6923 percent
Standard Error of Est. = 0,0885907
Mean absolute error = 0,0520378
Durbin-Watson statistic = 3,09984 (P=0,0004)
Lag 1 residual autocorrelation = -0,592241

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

Median F:N = 1,15105 - 0,00911438*Median BMI

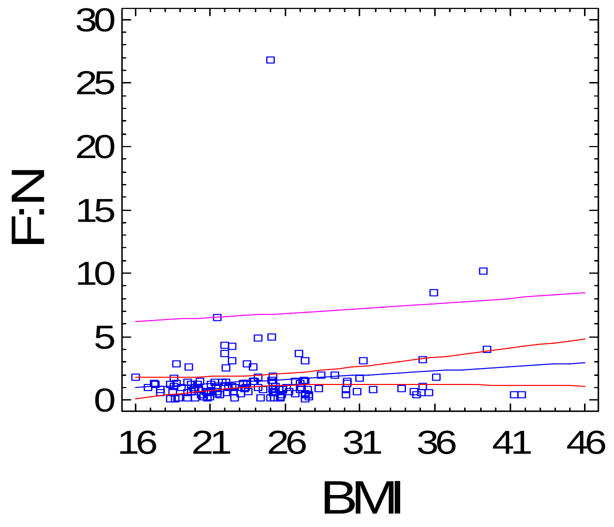
Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between Median F:N and Median BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 43,1282% of the variability in Median F:N. The correlation coefficient equals -0,656721, indicating a moderately strong relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,0885907. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,0520378 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation. Plot the residuals versus row order to see if there is any pattern which can be seen.

1.1.4.4.3 Prüfung auf Linearität

Plot of Fitted Model



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	-0,0984727	1,08162	-0,0910422	0,9276
Slope	0,0665721	0,0428998	1,5518	0,1231

Analysis of Variance

Source Sum of Squares Df Mean Square F-Ratio P-Value

Model	16,5923	1	16,5923	2,41	0,1231
Residual	916,399	133	6,89021		
Total (Corr.)	932,991	134			

Correlation Coefficient = 0,133357

R-squared = 1,7784 percent

R-squared (adjusted for d.f.) = 1,03989 percent

Standard Error of Est. = 2,62492

Mean absolute error = 1,15956

Durbin-Watson statistic = 2,09395 (P=0,2935)

Lag 1 residual autocorrelation = -0,0485004

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = -0,0984727 + 0,0665721*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 1,7784% of the variability in F:N. The correlation coefficient equals

0,133357, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 2,62492. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 1,15956 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.4.4.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Reciprocal-X	0,7175	51,49%
S-curve	0,7074	50,04%
Double reciprocal	-0,6961	48,46%
Logarithmic-X	-0,6917	47,84%
Multiplicative	-0,6796	46,19%
Square root-X	-0,6751	45,58%
Linear	-0,6567	43,13%
Square root-Y	-0,6500	42,24%
Exponential	-0,6429	41,33%
Reciprocal-Y	0,6280	39,44%
Logistic	<no fit>	
Log probit	<no fit>	

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the reciprocal-X model yields the highest R-Squared value with 51,4852%. This is 8,35702% higher than the currently selected linear model. To change models, select the Analysis Options dialog box.

1.1.4.4.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 1,0

Median of sample 2: 0,9

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 21,9

Average rank of sample 2: 25,4048

W = 302,5   P-value = 0,382826

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the

average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,238095
Two-sided large sample K-S statistic = 0,804362
Approximate P value = 0,553988

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,238095, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.4.4.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	14,2965	3	4,76551	0,68	0,5661
Within groups	918,694	131	7,01293		
Total (Corr.)	932,991	134			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,679531, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

	Count	Mean	Homogeneous Groups
ug	25	1,028	X
ng	49	1,42653	X
üg	40	1,74	X
a	21	2,05238	X

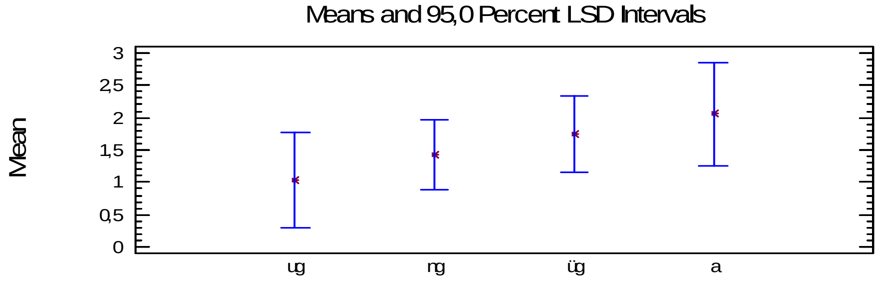
Contrast	Difference	+/- Limits
ug - ng	-0,398531	1,28759
ug - üg	-0,712	1,33563
ug - a	-1,02438	1,5507
ng - üg	-0,313469	1,11634
ng - a	-0,62585	1,36638
üg - a	-0,312381	1,41174

----

* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.4.4.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 0,95

Median of sample 2: 0,9

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 66,8509

Average rank of sample 2: 74,2381

W = 1328,0   P-value = 0,427424

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	6,45352	1	6,45352	0,93	0,3376
Within groups	926,537	133	6,96645		
Total (Corr.)	932,991	134			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,926372, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 2 variables at the 95,0% confidence level.

1.1.4.4.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:
N
F
F:N
Alter
Händer
EWeise
EGew
Krankh
Hunger
BMI
Status

Data input: observations
Number of complete cases: 135
Missing value treatment: listwise
Standardized: yes

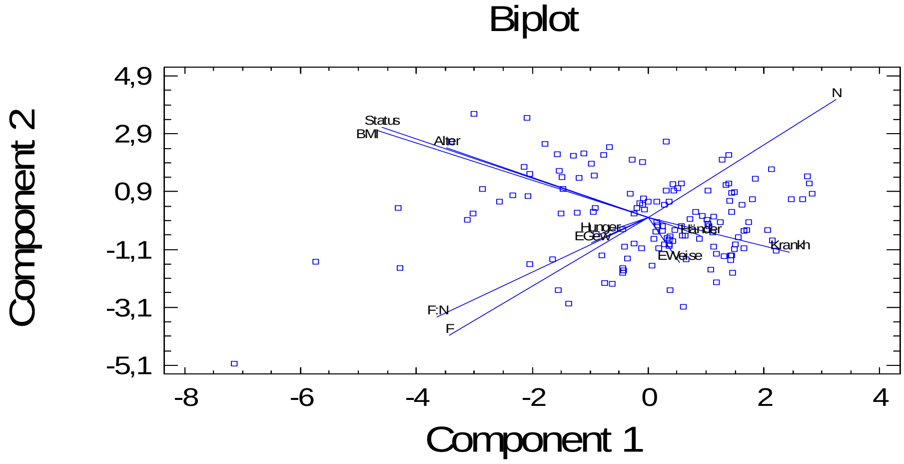
Number of components extracted: 4

Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,739	24,900	24,900
2	2,00114	18,192	43,092
3	1,2537	11,397	54,489
4	1,13016	10,274	64,764
5	0,940303	8,548	73,312
6	0,903378	8,213	81,524
7	0,784013	7,127	88,652
8	0,563414	5,122	93,774
9	0,368264	3,348	97,122
10	0,234481	2,132	99,253
11	0,0821542	0,747	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 11 variables which account for most of the variability in the data. In this case, 4 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 64,7636% of the variability in the original data.



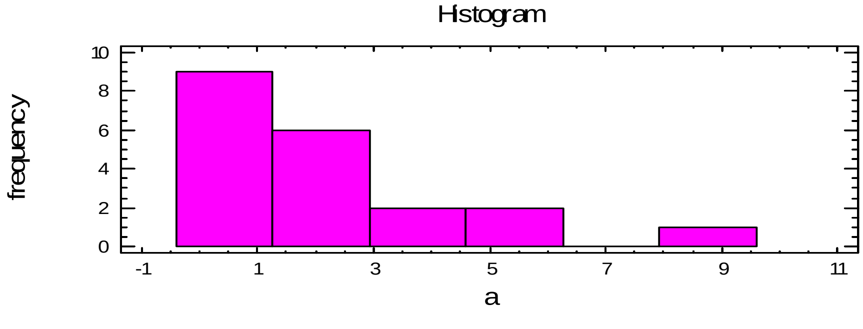
1.1.4.5 Schnitzel mit Pommes und Salat

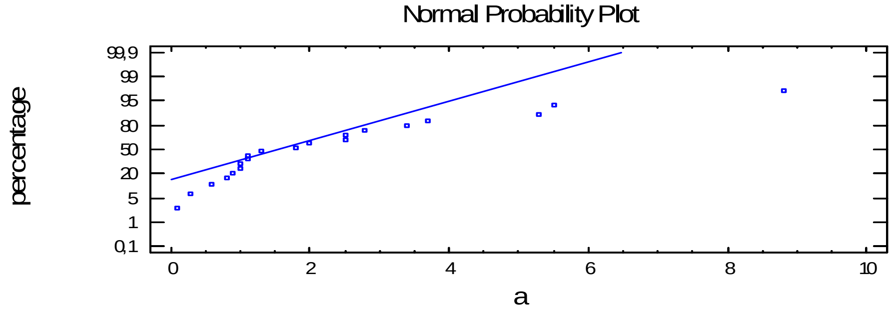
1.1.4.5.1 Prüfung auf Normalverteilung

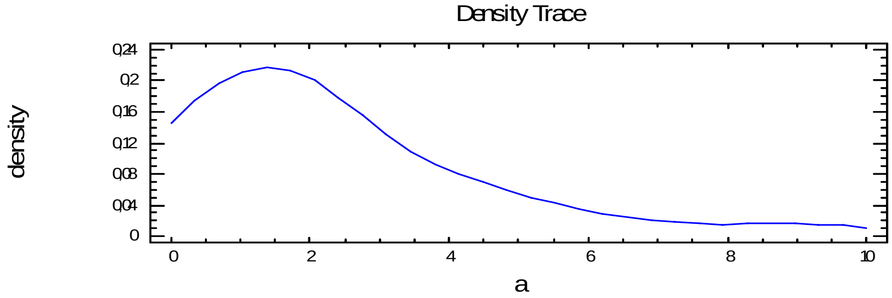
Tabelle 20: Fett – Nichtfett –Verhältnis – Observation Length [s] der vier Gruppen - Schnitzel mit Pommes und Salat

ug	ng	üg	a
4,4	4,2	2,6	3,4
0,4	1,8	1,3	
0,9	0,5	0,9	0,8
2,5	2,7	14,4	5,5
1,3	1,4	0,9	1,1
1,7	0,9	1,5	2,0
1,3	2,2	2,1	1,0
1,1	1,0	5,3	0,9
0,8	2,4	0,4	2,5
2,8	0,5	1,0	2,5
1,6	1,2	2,5	2,8
1,1	1,8	2,6	0,6
0,9	1,1	3,2	8,8
0,1	1,5	1,9	1,0
2,4	0,3	0,9	1,3
2,8	8,7	2,7	5,3
1,2	0,8	0,6	1,1
1,0	1,2	1,9	0,3
1,8	0,7	1,3	0,1
1,5	0,5	1,3	3,7
2,6	1,7	1,7	1,8
1,1	1,6	2,7	
0,6	0,3	1,2	
	1,2	3,2	
	0,7	2,3	

	1,8	2,2	
	1,2	0,6	
	2,2	1,5	
	0,6	2,4	
	0,9	1,7	
	1,1	11,5	
	1,1	1,7	
	0,6	0,8	
	0,6	0,1	
	0,7	1,2	
	1,4	0,7	
	2,5	1,5	
	1,9	1,7	
	1,5	2,0	
	0,7		
	1,9		
	1,1		
	1,6		
	2,5		
	1,6		
	8,8		
	1,5		
	3,3		
	2,2		







Summary Statistics for a

Count = 20

Average = 2,325

Variance = 4,65882

Standard deviation = 2,15843

Minimum = 0,1

Maximum = 8,8

Range = 8,7

Stnd. skewness = 3,11404

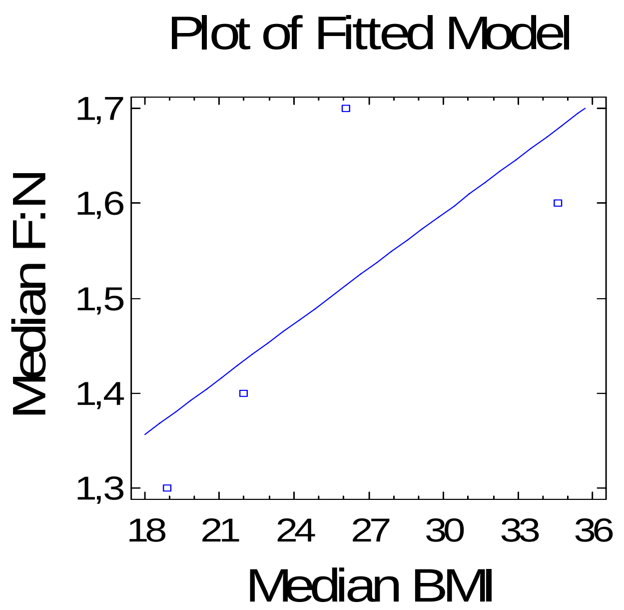
Stnd. kurtosis = 2,88905

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized

skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

1.1.4.5.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N

Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	1,00641	0,341022	2,95115	0,0982
Slope	0,0194328	0,013078	1,48585	0,2756

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,0524687	1	0,0524687	2,21	0,2756
Residual	0,0475313	2	0,0237657		

Total (Corr.)	0,1	3

Correlation Coefficient = 0,724353

R-squared = 52,4687 percent

R-squared (adjusted for d.f.) = 28,703 percent

Standard Error of Est. = 0,154161

Mean absolute error = 0,0931985

Durbin-Watson statistic = 2,53399 (P=0,0156)

Lag 1 residual autocorrelation = -0,389403

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

Median F:N = 1,00641 + 0,0194328*Median BMI

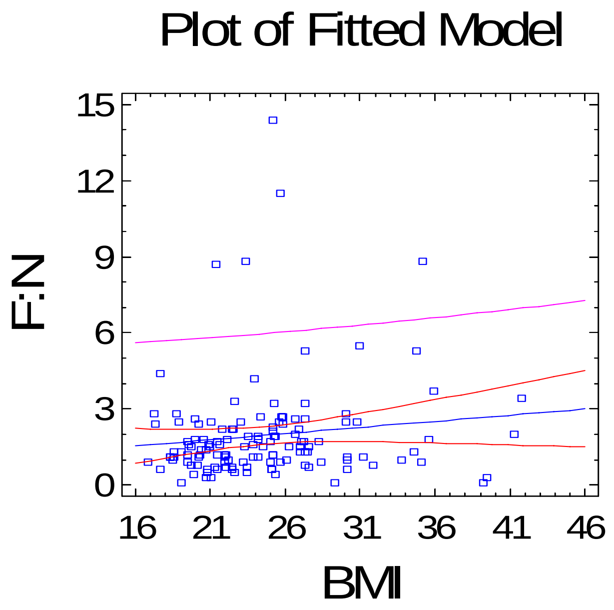
Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between Median F:N and Median BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 52,4687% of the variability in Median F:N. The correlation coefficient equals 0,724353, indicating a moderately strong relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,154161. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,0931985 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation.

Plot the residuals versus row order to see if there is any pattern which can be seen.

1.1.4.5.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	0,757873	0,869316	0,871804	0,3849
Slope	0,0487368	0,0345451	1,41082	0,1607

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	8,12172	1	8,12172	1,99	0,1607
Residual	526,376	129	4,08043		
Total (Corr.)	534,497	130			

Correlation Coefficient = 0,123268

R-squared = 1,51951 percent

R-squared (adjusted for d.f.) = 0,75609 percent

Standard Error of Est. = 2,02001

Mean absolute error = 1,15474

Durbin-Watson statistic = 2,10716 (P=0,2709)

Lag 1 residual autocorrelation = -0,0589536

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 0,757873 + 0,0487368*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 1,51951% of the variability in F:N. The correlation coefficient equals 0,123268, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 2,02001. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 1,15474 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.4.5.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Double reciprocal	0,8423	70,95%
S-curve	-0,8296	68,83%
Reciprocal-X	-0,8155	66,50%
Multiplicative	0,7877	62,05%
Logarithmic-X	0,7735	59,82%
Reciprocal-Y	-0,7516	56,49%
Square root-X	0,7496	56,18%
Exponential	0,7388	54,58%
Square root-Y	0,7318	53,55%
Linear	0,7244	52,47%

Logistic <no fit>
Log probit <no fit>

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the double reciprocal model yields the highest R-Squared value with 70,9467%. This is 18,478% higher than the currently selected linear model. To change models, select the Analysis Options dialog box.

1.1.4.5.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 1,3

Median of sample 2: 1,55

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 20,7391

Average rank of sample 2: 23,45

W = 259,0 P-value = 0,486985

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,256522
Two-sided large sample K-S statistic = 0,839013
Approximate P value = 0,492899

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,256522, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.4.5.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source Sum of Squares Df Mean Square F-Ratio P-Value

Between groups	13,904	3	4,63465	1,13	0,3393
Within groups	520,593	127	4,09916		
Total (Corr.)	534,497	130			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 1,13063, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

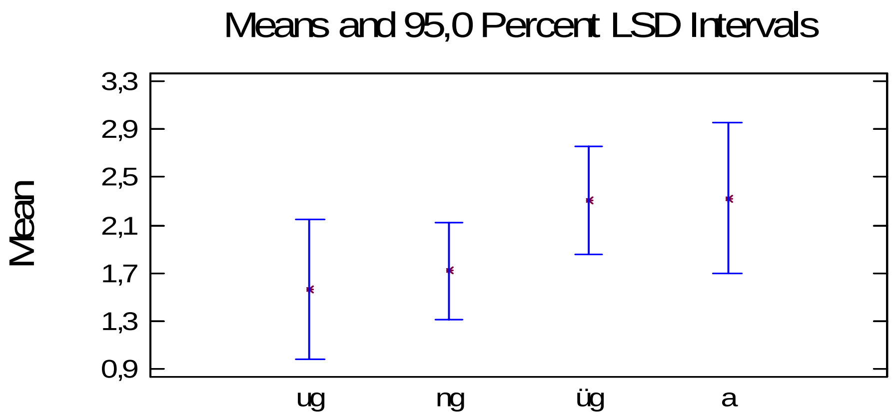
	Count	Mean	Homogeneous Groups
ug	23	1,56087	X
ng	49	1,71837	X
üg	39	2,30769	X
a	20	2,325	X

Contrast	Difference	+/- Limits
ug - ng	-0,157498	1,01265
ug - üg	-0,746823	1,0533
ug - a	-0,76413	1,22493
ng - üg	-0,589325	0,859737
ng - a	-0,606633	1,06308
üg - a	-0,0173077	1,10188

* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.4.5.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 1,5

Median of sample 2: 1,55

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 65,0631

Average rank of sample 2: 71,2

W = 1214,0   P-value = 0,507418

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	3,16567	1	3,16567	0,77	0,3823
Within groups	531,332	129	4,11885		

Total (Corr.)   534,497   130

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,768581, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 2 variables at the 95,0% confidence level.

1.1.4.5.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

F_Schnitzel
F_Pommes
N
F:N
Alter
Händer
EWeise
EGew
Krankh
Hunger
BMI
Status

Data input: observations

Number of complete cases: 131
Missing value treatment: listwise
Standardized: yes

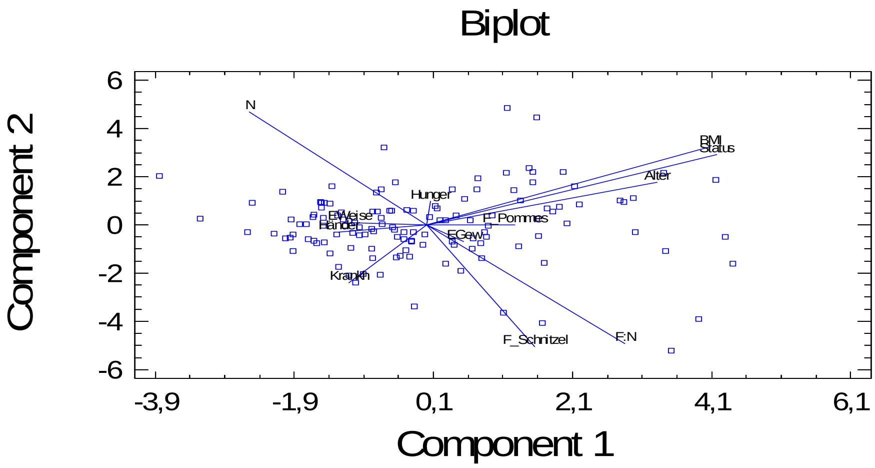
Number of components extracted: 5

Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,61039	21,753	21,753
2	2,11036	17,586	39,340
3	1,31261	10,938	50,278
4	1,18852	9,904	60,182
5	1,05385	8,782	68,965
6	0,917972	7,650	76,614
7	0,823988	6,867	83,481
8	0,770684	6,422	89,903
9	0,497676	4,147	94,051
10	0,368068	3,067	97,118
11	0,263219	2,193	99,311
12	0,082652	0,689	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 12 variables which account for most of the variability in the data. In this case, 5 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 68,9645% of the variability in the original data.


Biplot
Component 2
Component 1
6
4
2
0
-2
-4
-6
-3,9
-1,9
0,1
2,1
4,1
6,1
N
BMI
Status
Alter
Hunger
Pommes
F_Schnitzel
F:N
Krankh

1.1.5 Observation Count

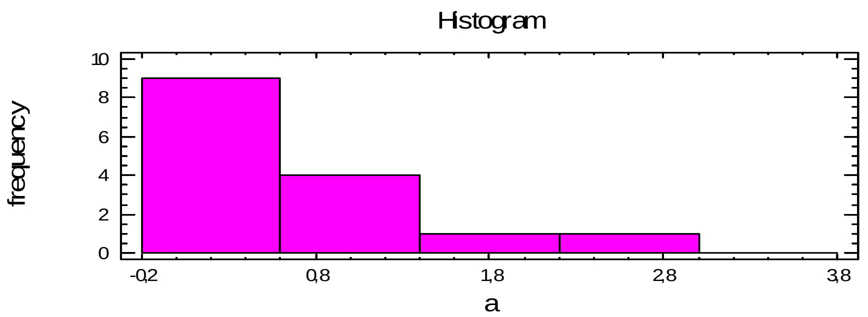
1.1.5.1 Hamburger und Birne

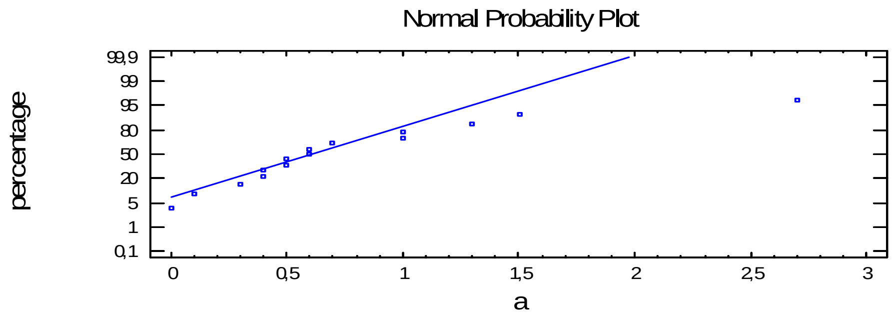
1.1.5.1.1 Prüfung auf Normalverteilung

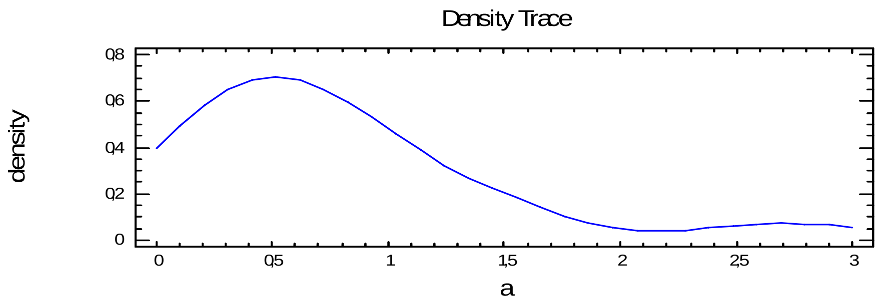
Tabelle 21: Fett – Nichtfett –Verhältnis – Observation Count der vier Gruppen - Hamburger und Birne

ug	ng	üg	a
0,0	0,5	0,3	0,1
0,7	0,2	0,0	1,0
0,0	0,9	0,2	0,0
1,4	0,1	0,5	2,7
0,0	0,3	0,5	0,5
0,5	0,0	0,2	0,1
0,9	0,0	3,0	0,5
0,0	0,7	1,0	0,2
0,0	0,3	0,0	0,7
0,1	0,3	0,3	1,0
0,2	0,1	0,3	0,0
0,5	0,3	4,0	1,5
1,5	1,0	1,7	0,6
1,7	0,9	0,8	0,4
0,5	0,1	0,8	1,3
0,0	0,9	0,8	0,3
0,3	0,7	0,6	0,5
0,2	2,7	0,3	0,3
0,8	0,5	0,0	0,4
0,4	0,3	0,3	
0,1	0,0	0,0	0,6
0,3	0,3	0,3	0,7
	0,5	0,6	
	2,0	1,5	

	1,7	0,6	
	0,9	0,8	
	1,3	2,3	
	0,1	2,0	
	3,5	0,0	
	0,3	0,3	
	4,0	0,0	
	0,4	0,3	
	0,0	1,0	
	0,3	2,0	
	0,3	0,7	
	0,2	1,5	
	1,0	0,4	
	5,0	0,3	
	2,3	1,7	
	1,3	1,0	
	0,3	0,0	
	2,5		
	0,1		
	0,8		
	1,0		
	1,7		







Summary Statistics for a

Count = 15

Average = 0,773333

Variance = 0,456381

Standard deviation = 0,67556

Minimum = 0,0

Maximum = 2,7

Range = 2,7

Stnd. skewness = 2,82149

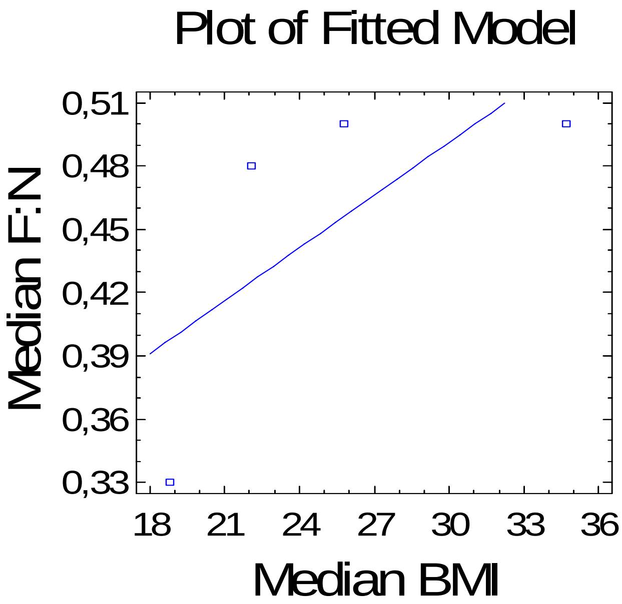
Stnd. kurtosis = 3,19562

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized

skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

1.1.5.1.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N

Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	0,240756	0,158302	1,52087	0,2677
Slope	0,00835282	0,00608001	1,37382	0,3032

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,0098438	1	0,0098438	1,89	0,3032
Residual	0,0104312	2	0,0052156		

Total (Corr.) 0,020275 3

Correlation Coefficient = 0,696789

R-squared = 48,5514 percent

R-squared (adjusted for d.f.) = 22,8272 percent

Standard Error of Est. = 0,0722191

Mean absolute error = 0,049194

Durbin-Watson statistic = 1,97829 (P=0,1091)

Lag 1 residual autocorrelation = -0,254292

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

Median F:N = 0,240756 + 0,00835282*Median BMI

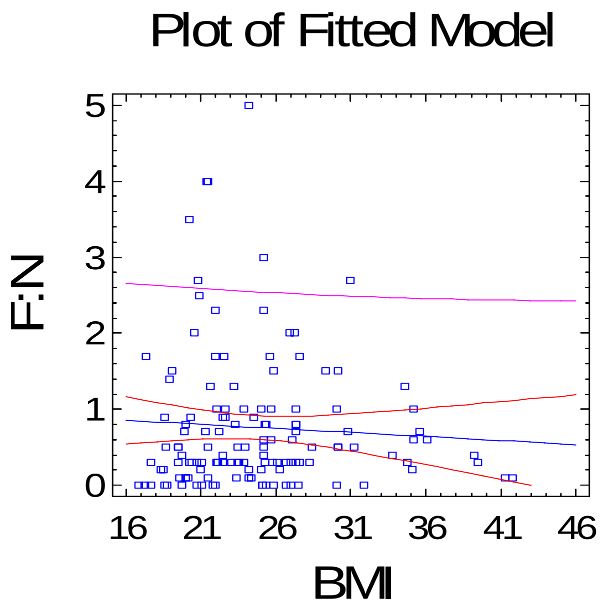
Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between Median F:N and Median BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 48,5514% of the variability in Median F:N. The correlation coefficient equals 0,696789, indicating a moderately strong relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,0722191. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,049194 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in

the residuals.

1.1.5.1.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	1,02527	0,38516	2,66193	0,0088
Slope	-0,0106356	0,0152051	-0,699477	0,4855

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,393609	1	0,393609	0,49	0,4855
Residual	102,974	128	0,804485		
Total (Corr.)	103,368	129			

Correlation Coefficient = -0,0617078

R-squared = 0,380785 percent

R-squared (adjusted for d.f.) = -0,39749 percent

Standard Error of Est. = 0,896931

Mean absolute error = 0,625576

Durbin-Watson statistic = 2,13173 (P=0,2274)

Lag 1 residual autocorrelation = -0,0662329

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 1,02527 - 0,0106356*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 0,380785% of the variability in F:N. The correlation coefficient equals -0,0617078, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,896931. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,625576 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.5.1.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Reciprocal-X	-0,8106	65,70%
S-curve	-0,8020	64,32%
Double reciprocal	0,7941	63,06%
Logarithmic-X	0,7550	57,00%
Log probit	0,7533	56,74%
Multiplicative	0,7458	55,62%
Square root-X	0,7259	52,70%
Linear	0,6968	48,55%
Logistic	0,6945	48,24%
Square root-Y	0,6919	47,87%
Exponential	0,6872	47,23%
Reciprocal-Y	-0,6786	46,05%

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the reciprocal-X model yields the highest R-Squared value with 65,7016%. This is 17,1501% higher than the currently selected linear model. To change models, select the Analysis Options dialog box.

1.1.5.1.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 0,3

Median of sample 2: 0,5

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 19,5909

Average rank of sample 2: 24,5238

W = 284,0   P-value = 0,199475

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,307359
Two-sided large sample K-S statistic = 1,00747
Approximate P value = 0,262968

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,307359, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.5.1.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	3,64653	3	1,21551	1,54	0,2085

Within groups	99,7212	126	0,791438
Total (Corr.)	103,368	129	

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 1,53583, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

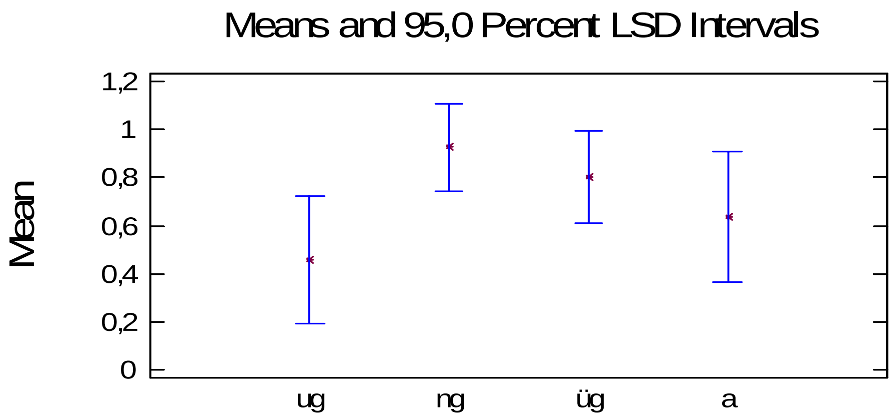
	Count	Mean	Homogeneous Groups
ug	22	0,459091	X
a	21	0,638095	XX
üg	41	0,802439	XX
ng	46	0,926087	X

Contrast	Difference	+/- Limits
ug - ng	*-0,466996	0,456365
ug - üg	-0,343348	0,465281
ug - a	-0,179004	0,537108
ng - üg	0,123648	0,378127
ng - a	0,287992	0,463658
üg - a	0,164344	0,472436

* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. An asterisk has been placed next to 1 pair, indicating that this pair shows a statistically significant difference at the 95,0% confidence level. At the top of the page, 2 homogenous groups are identified using columns of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.5.1.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 0,5

Median of sample 2: 0,5

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 65,422

Average rank of sample 2: 65,9048

W = 1153,0   P-value = 0,95942

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	0,381655	1	0,381655	0,47	0,4922
Within groups	102,986	128	0,804578		

Total (Corr.)	103,368	129

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,474354, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 2 variables at the 95,0% confidence level.

1.1.5.1.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

Hamb
Birne
Hamb:Birne
F
N
F:N
Alter
Händer
EWeise
EGew
Krankh
Hunger
BMI
Status

Data input: observations

Number of complete cases: 129

Missing value treatment: listwise

Standardized: yes

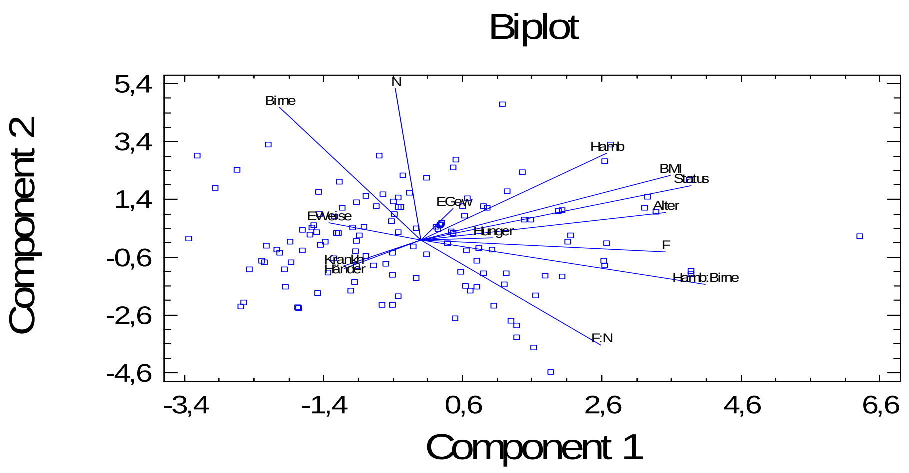
Number of components extracted: 5

Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,89188	20,656	20,656
2	2,48765	17,769	38,425
3	2,13282	15,234	53,660
4	1,16819	8,344	62,004
5	1,10699	7,907	69,911
6	0,929105	6,636	76,547
7	0,860255	6,145	82,692
8	0,831949	5,942	88,635
9	0,625133	4,465	93,100
10	0,492551	3,518	96,618
11	0,206471	1,475	98,093
12	0,126842	0,906	98,999
13	0,0897172	0,641	99,640
14	0,0504544	0,360	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 14 variables which account for most of the variability in the data. In this case, 5 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 69,9109% of the variability in the original data.



1.1.5.2 Praline und Erdbeere

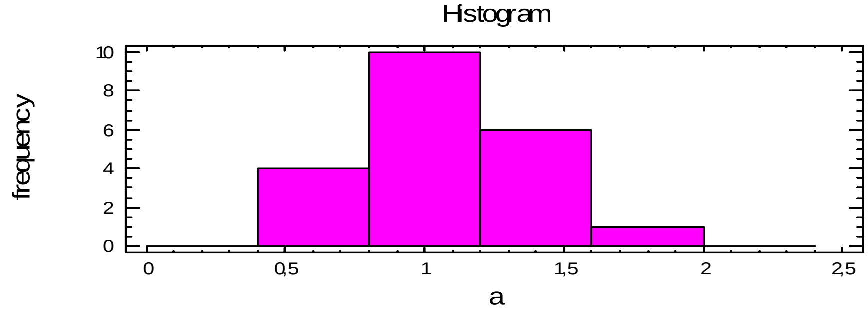
1.1.5.2.1 Prüfung auf Normalverteilung

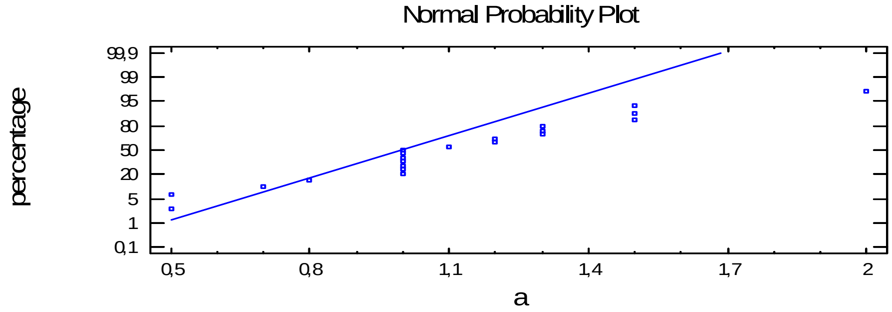
Tabelle 22: Fett – Nichtfett –Verhältnis – Observation Count der vier Gruppen - Praline und Erdbeere

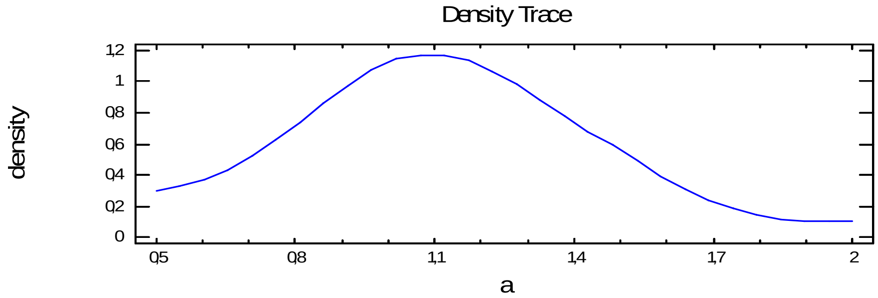
ug	ng	üg	a
1,5	1,3	1,0	1,2
1,0	1,3	1,0	1,3
1,3	1,3	1,0	1,5
1,3	1,3	1,2	1,0
1,0	2,0	1,5	1,0
1,3	1,1	1,0	1,0
1,2	2,0	1,3	1,1
1,0	1,0	1,5	1,2
1,0	1,3	1,0	1,5
1,0	0,8	1,0	1,3
1,0	1,2	1,0	1,3
1,3	1,0	1,5	1,0
0,7	1,5	0,7	1,0
1,0	1,0	1,3	0,8
1,0	1,0	1,1	1,5
1,3	0,7	1,4	0,5

0,7	1,3	1,0	1,0
0,3	1,5	1,5	0,7
1,3	1,0	1,0	0,5
1,3	2,0	0,8	2,0
1,0	1,5	0,9	1,0
2,0	1,0	0,8	
1,4	1,0	1,0	
	1,0	1,0	
	1,0	1,0	
	1,0	1,5	
	1,0	1,0	
	1,3	1,5	
	1,0	1,1	
	1,0	0,8	
	1,5	1,0	
	0,8	1,0	
	1,5	2,0	
	1,0	1,0	
	1,3	1,3	
	1,0	1,0	
	1,0	1,0	
	1,3	2,0	
	0,8	1,0	
	1,0		
	1,0		
	1,3		
	1,3		
	1,0		
	1,0		

	1,3		
	2,0		
	1,3		
	1,0		







Summary Statistics for a

Count = 21

Average = 1,11429

Variance = 0,123286

Standard deviation = 0,351121

Minimum = 0,5

Maximum = 2,0

Range = 1,5

Stnd. skewness = 0,743415

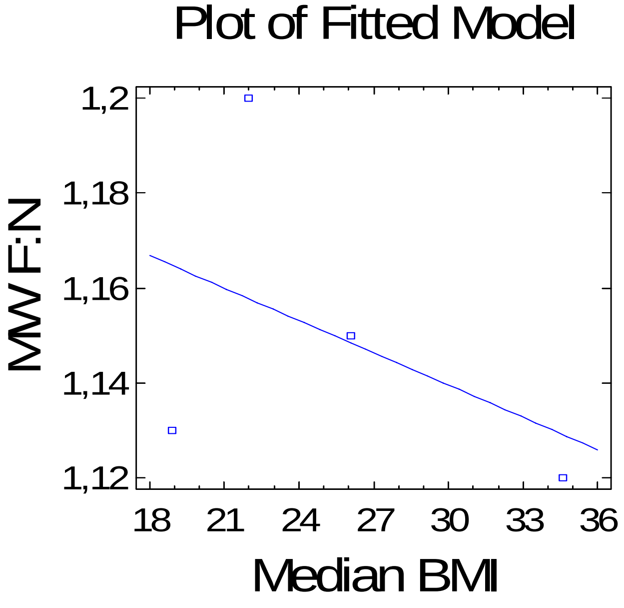
Stnd. kurtosis = 0,919145

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is within the range expected for data from a normal distribution. The standardized kurtosis value is within the range expected for data from a normal distribution.

1.1.5.2.2 Prüfung auf Linearität (Mediane)

Es wurde mit den Mittelwerten der Fett – Nichtfett – Verhältnisse der einzelnen Gruppen gerechnet.



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: MW F:N

Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	1,20777	0,0868279	13,9099	0,0051
Slope	-0,00227436	0,00332996	-0,683001	0,5651

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,000718699	1	0,000718699	0,47	0,5651
Residual	0,0030813	2	0,00154065		
Total (Co	0,0038	3			

Correlation Coefficient = -0,434892

R-squared = 18,9131 percent

R-squared (adjusted for d.f.) = -21,6303 percent

Standard Error of Est. = 0,0392511

Mean absolute error = 0,0219296

Durbin-Watson statistic = 2,50058 (P=0,0182)

Lag 1 residual autocorrelation = -0,459985

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between MW F:N and Median BMI. The equation of the fitted model is

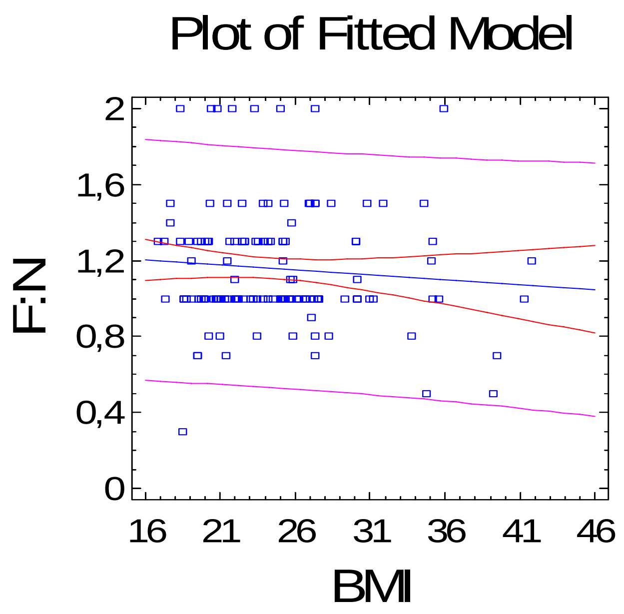
MW F:N = 1,20777 - 0,00227436*Median BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between MW F:N and Median BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 18,9131% of the variability in MW F:N. The correlation coefficient equals -0,434892, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,0392511. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,0219296 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation. Plot the residuals versus row order to see if there is any pattern which can be seen.

1.1.5.2.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	1,28561	0,134478	9,56002	0,0000
Slope	-0,00517933	0,00532474	-0,972692	0,3325

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,0946693	1	0,0946693	0,95	0,3325
Residual	13,0078	130	0,10006		
Total (Corr.)	13,1024	131			

Correlation Coefficient = -0,0850019

R-squared = 0,722533 percent

R-squared (adjusted for d.f.) = -0,0411398 percent

Standard Error of Est. = 0,316322

Mean absolute error = 0,245

Durbin-Watson statistic = 1,93918 (P=0,3641)

Lag 1 residual autocorrelation = 0,029279

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 1,28561 - 0,00517933*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 0,722533% of the variability in F:N. The correlation coefficient equals -0,0850019, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,316322. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,245 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.5.2.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Reciprocal-Y	0,4405	19,41%
Exponential	-0,4377	19,16%
Square root-Y	-0,4363	19,04%
Linear	-0,4349	18,91%
Square root-X	-0,4093	16,75%
Multiplicative	-0,3834	14,70%
Logarithmic-X	-0,3810	14,52%
Double reciprocal	-0,3216	10,34%
S-curve	0,3197	10,22%
Reciprocal-X	0,3178	10,10%
Logistic	<no fit>	
Log probit	<no fit>	

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the reciprocal-Y model yields the highest R-Squared value with 19,4083%. This is 0,495166% higher than the currently selected linear model. To change models, select the Analysis Options dialog box.

1.1.5.2.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 1,0

Median of sample 2: 1,0

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 23,8958

Average rank of sample 2: 23,0682

W = 254,5   P-value = 0,837293

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,393375
Two-sided large sample K-S statistic = 1,30333
Approximate P value = 0,0669264

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,393375, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.5.2.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	0,155439	3	0,051813	0,51	0,6746
Within groups	12,947	128	0,101148		
Total (Corr.)	13,1024	131			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,512248, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

	Count	Mean	Homogeneous Groups
a	21	1,11429	X
ug	23	1,12609	X
üg	39	1,14615	X

ng	49	1,2	X

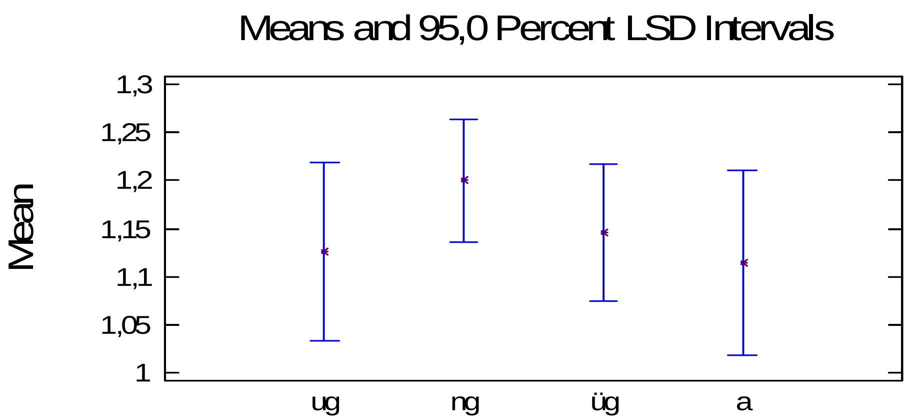
Contrast	Difference	+/- Limits
ug - ng	-0,073913	0,159059
ug - üg	-0,0200669	0,165445
ug - a	0,0118012	0,189936
ng - üg	0,0538462	0,135041
ng - a	0,0857143	0,164133
üg - a	0,0318681	0,170329

----

* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.5.2.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 1,0

Median of sample 2: 1,0

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 67,7703

Average rank of sample 2: 63,1136

W = 1135,5   P-value = 0,58987

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	0,0468	1	0,0468	0,47	0,4960
Within groups	13,0556	130	0,100428		
Total (Corr.)	13,1024	131			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,466007, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a

statistically significant difference between the means of the 2

variables at the 95,0% confidence level.

1.1.5.2.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

F

N

F:N

Alter

Händer

EWeise

EGew

Krankh

Hunger

BMI

Status

Data input: observations

Number of complete cases: 132

Missing value treatment: listwise

Standardized: yes

Number of components extracted: 5

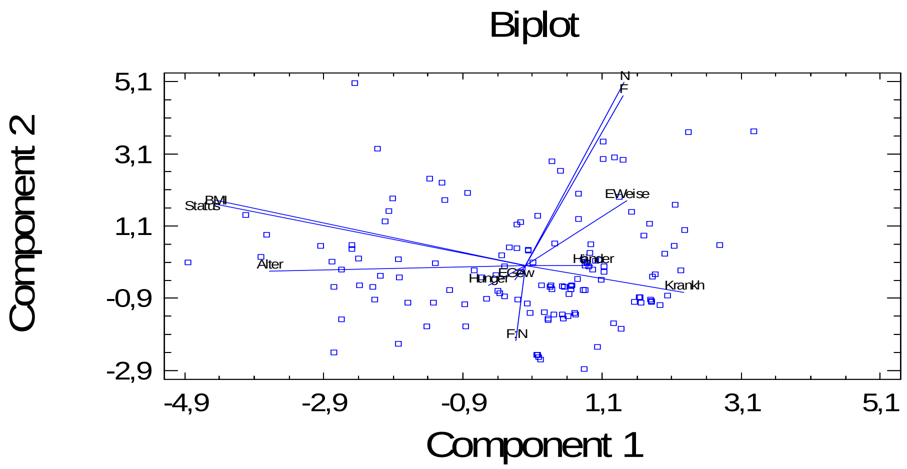
Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,50193	22,745	22,745
2	2,11359	19,214	41,959
3	1,32025	12,002	53,962
4	1,11896	10,172	64,134
5	1,05185	9,562	73,696
6	0,894768	8,134	81,831

7	0,744903	6,772	88,602
8	0,65043	5,913	94,515
9	0,497853	4,526	99,041
10	0,0844982	0,768	99,810
11	0,0209544	0,190	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 11 variables which account for most of the variability in the data. In this case, 5 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 73,6963% of the variability in the original data.



1.1.5.3 Chips und Weintrauben

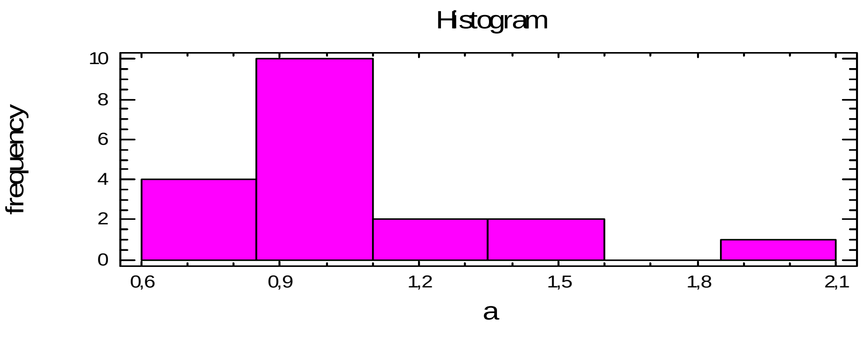
1.1.5.3.1 Prüfung auf Normalverteilung

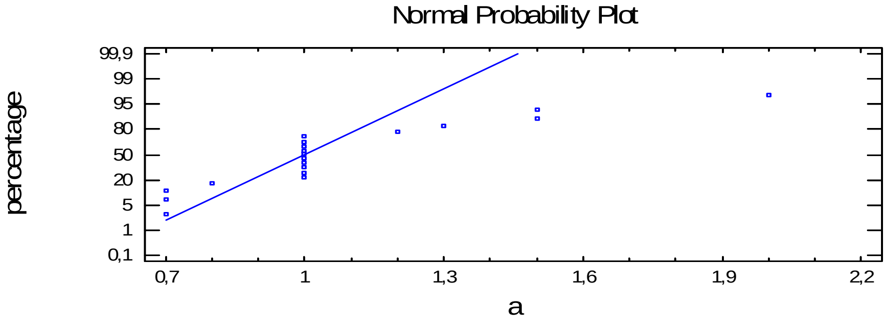
Tabelle 23: Fett – Nichtfett –Verhältnis – Observation Count der vier Gruppen - Chips und Weintrauben

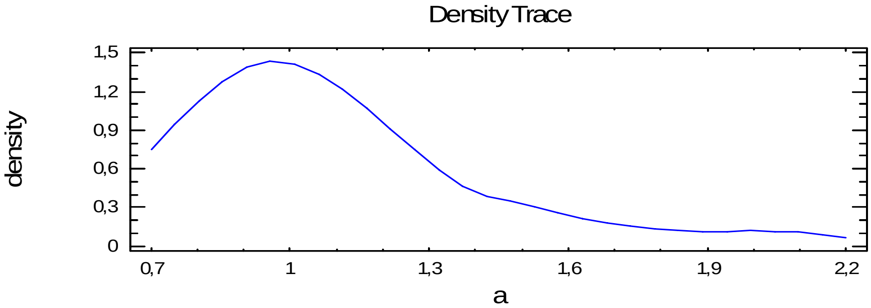
ug	ng	üg	a
1,0	0,8	1,0	1,5
1,0	1,0	1,0	1,5
1,0	1,0	1,3	1,0

0,8	1,3	1,1	1,0
1,0	0,3	1,3	0,7
1,2	0,9	2,0	1,0
1,0	1,3	1,2	1,0
2,5	1,0	2,0	1,0
0,8	0,8	1,0	1,0
1,0	1,3	1,0	1,0
1,3	1,0	0,8	1,2
1,3	1,0	1,0	1,0
1,3	1,0	0,8	0,8
0,5	1,0	1,0	1,0
0,8	1,5	1,0	1,3
0,8	1,0	1,0	2,0
0,9	0,8	0,8	0,7
1,0	2,0	1,0	0,7
1,0	0,9	0,8	1,0
	1,0	1,0	1,0
	1,0	1,2	0,9
	0,8	0,8	
	1,0	1,2	
	0,8	1,2	
	1,0	0,7	
	1,0	1,0	
	1,3	2,0	
	0,0	1,0	
	0,8	1,1	
	0,9	0,8	
	0,5	1,0	
	1,0	0,7	

	1,3	0,8	
	1,0	0,8	
	1,0	1,0	
	0,7	0,8	
	1,5	1,0	
	1,2	1,0	
	0,8	0,7	
	1,0		
	1,2		
	1,5		
	0,5		
	1,0		
	0,8		
	0,7		
	1,5		
	0,8		
	0,3		
	1,0		
	1,2		







Summary Statistics for a

Count = 19

Average = 1,07368

Variance = 0,102047

Standard deviation = 0,319448

Minimum = 0,7

Maximum = 2,0

Range = 1,3

Stnd. skewness = 2,6518

Stnd. kurtosis = 2,5873

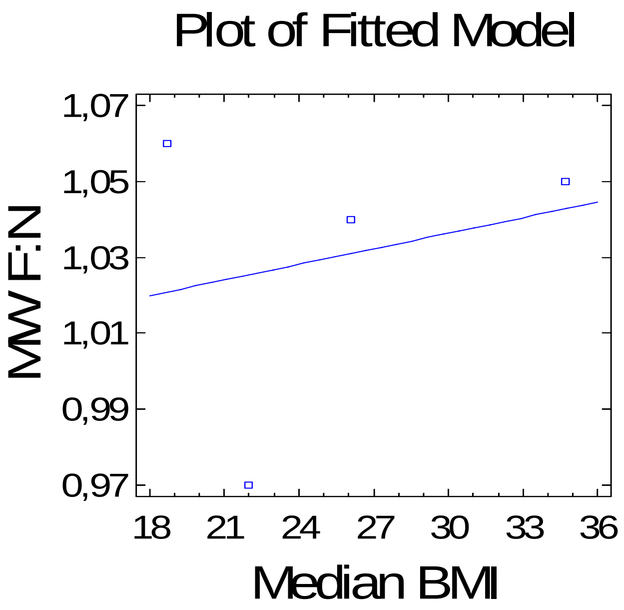
The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized

skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

1.1.5.3.2 Prüfung auf Linearität (Mediane)

Es wurde mit den Mittelwerten der Fett – Nichtfett – Verhältnisse der einzelnen Gruppen gerechnet.



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: MW F:N

Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	0,995324	0,105894	9,39923	0,0111
Slope	0,00136654	0,00406161	0,336454	0,7686

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,000267843	1	0,000267843	0,11	0,7686

Residual 0,00473216 2 0,00236608

Total (Corr.) 0,005 3

Correlation Coefficient = 0,231449

R-squared = 5,35685 percent

R-squared (adjusted for d.f.) = -41,9647 percent

Standard Error of Est. = 0,0486424

Mean absolute error = 0,027694

Durbin-Watson statistic = 2,76452 (P=0,0045)

Lag 1 residual autocorrelation = -0,549536

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between MW F:N and Median BMI. The equation of the fitted model is

MW F:N = 0,995324 + 0,00136654*Median BMI

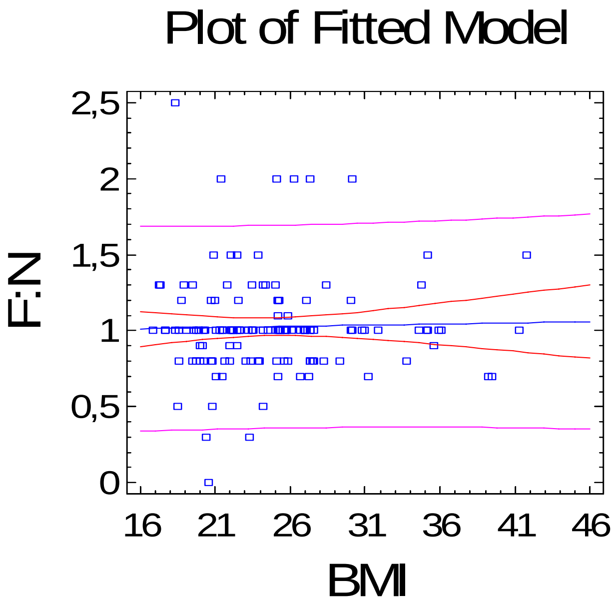
Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between MW F:N and Median BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 5,35685% of the variability in MW F:N. The correlation coefficient equals 0,231449, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,0486424. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,027694 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is

less than 0.05, there is an indication of possible serial correlation. Plot the residuals versus row order to see if there is any pattern which can be seen.

1.1.5.3.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	0,98627	0,142811	6,9061	0,0000
Slope	0,00160506	0,00562356	0,285416	0,7758

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,0091912	1	0,0091912	0,08	0,7758
Residual	14,4419	128	0,112827		
Total (Corr.)	14,4511	129			

Correlation Coefficient = 0,0252195

R-squared = 0,0636022 percent

R-squared (adjusted for d.f.) = -0,717151 percent

Standard Error of Est. = 0,335898

Mean absolute error = 0,21422

Durbin-Watson statistic = 2,2802 (P=0,0552)

Lag 1 residual autocorrelation = -0,142559

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 0,98627 + 0,00160506*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and

BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 0,0636022% of the variability in F:N. The correlation coefficient equals 0,0252195, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,335898. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,21422 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.5.3.4 Vergleich von alternativen Modellen

Model	Correlation	R-Squared
Reciprocal-Y	-0,2396	5,74%
Exponential	0,2356	5,55%
Square root-Y	0,2335	5,45%
Linear	0,2314	5,36%
Square root-X	0,2089	4,36%
Multiplicative	0,1884	3,55%
Logarithmic-X	0,1838	3,38%
Double reciprocal	0,1373	1,89%
S-curve	-0,1324	1,75%
Reciprocal-X	-0,1273	1,62%

Logistic <no fit>
Log probit <no fit>

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the reciprocal-Y model yields the highest R-Squared value with 5,7403%. This is 0,383443% higher than the currently selected linear model. To change models, select the Analysis Options dialog box.

1.1.5.3.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 1,0

Median of sample 2: 1,0

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

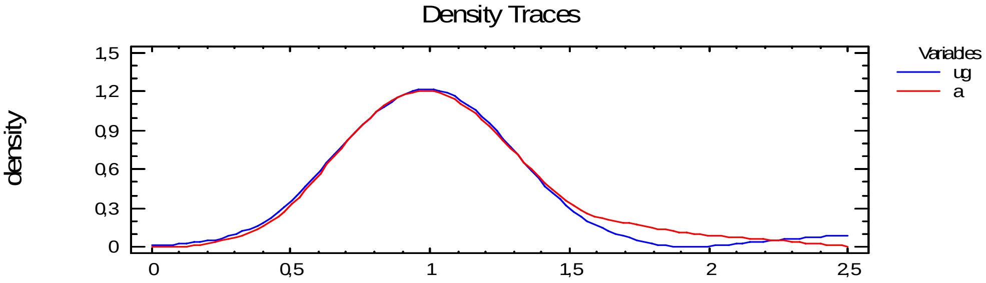
Average rank of sample 1: 20,1316

Average rank of sample 2: 20,8333

W = 206,5 P-value = 0,851929

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.



Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,498747
Two-sided large sample K-S statistic = 1,5752
Approximate P value = 0,0139904

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,498747, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is less than 0,05, there is a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.5.3.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	0,179515	3	0,0598382	0,53	0,6637
Within groups	14,2716	126	0,113266		
Total (Corr.)	14,4511	129			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,528296, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

	Count	Mean	Homogeneous Groups
ng	51	0,980392	X
üg	39	1,04872	X
a	21	1,0619	X
ug	19	1,06316	X

Contrast	Difference	+/- Limits
a - ng	0,0815126	0,172688

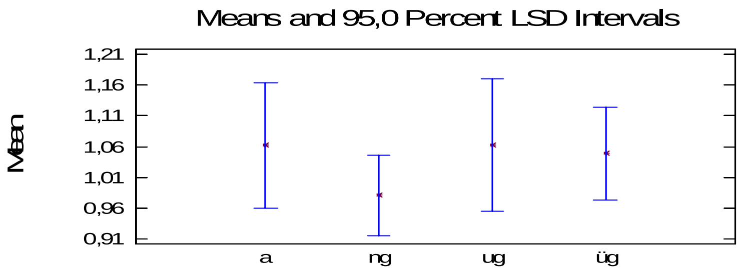
a - ug	-0,00125313	0,210879
a - üg	0,0131868	0,18027
ng - ug	-0,0827657	0,17901
ng - üg	-0,0683258	0,141675
ug - üg	0,0144399	0,186335

----

* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.5.3.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 1,0

Median of sample 2: 1,0

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 64,8349

Average rank of sample 2: 68,9524

W = 1217,0   P-value = 0,635144

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value

Between groups	0,0320118	1	0,0320118	0,28	0,5949
Within groups	14,4191	128	0,112649		

Total (Corr.)	14,4511	129			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,284173, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 2 variables at the 95,0% confidence level.

1.1.5.3.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

Alter
BMI
EGew
EWeise
F
F:N
Händer
Hunger
Krankh
N
Status

Data input: observations
Number of complete cases: 130
Missing value treatment: listwise
Standardized: yes

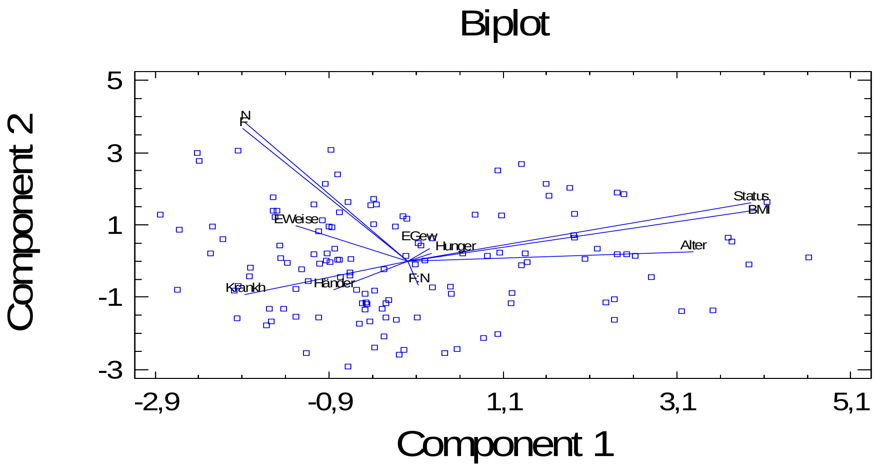
Number of components extracted: 5

Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,56014	23,274	23,274
2	1,881	17,100	40,374
3	1,21723	11,066	51,440
4	1,15699	10,518	61,958
5	1,06898	9,718	71,676
6	0,937615	8,524	80,200
7	0,828206	7,529	87,729
8	0,708233	6,438	94,167
9	0,52796	4,800	98,967
10	0,0862666	0,784	99,751
11	0,0273815	0,249	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 11 variables which account for most of the variability in the data. In this case, 5 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 71,6758% of the variability in the original data.



1.1.5.4 Bananen und Schokolade

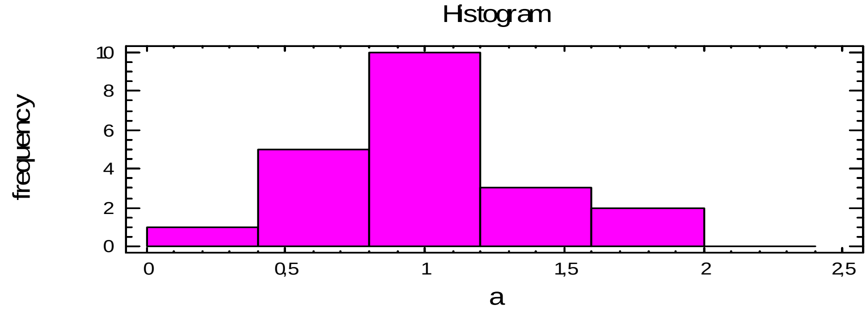
1.1.5.4.1 Prüfung auf Normalverteilung

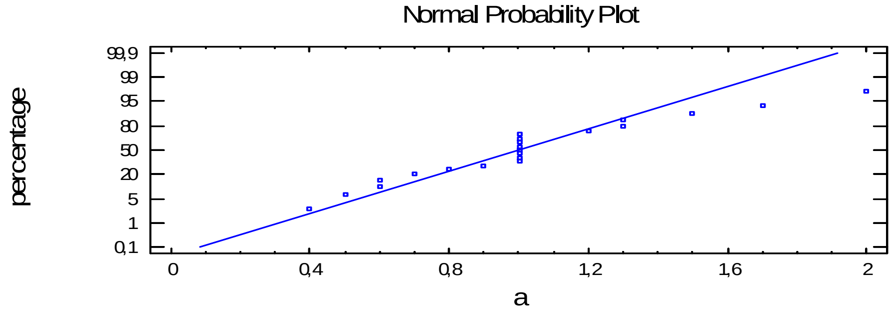
Tabelle 24: Fett – Nichtfett –Verhältnis – Observation Count der vier Gruppen - Bananen und Schokolade

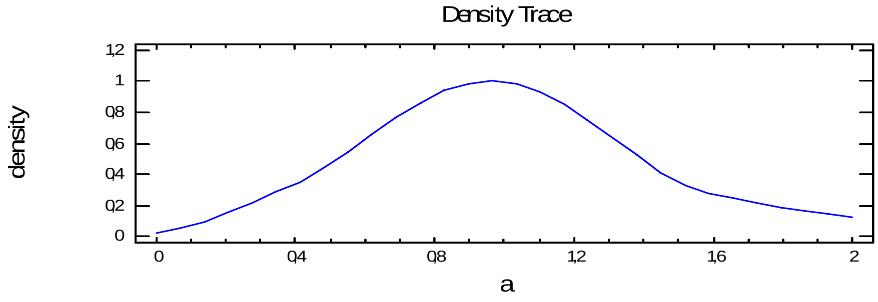
ug	ng	üg	a
1,0	0,8	1,5	0,9
0,8	1,3	0,7	1,2
0,8	1,0	0,5	1,0
1,0	0,6	0,9	1,0
1,0	0,7	0,8	1,0
1,0	0,9	1,5	0,4
0,8	1,2	1,3	0,7
1,0	0,9	1,0	1,0
1,0	1,0	1,3	1,0
0,7	1,5	0,8	0,5
1,0	0,9	0,9	0,6
1,0	0,7	0,8	1,0
0,7	2,0	1,3	1,3
0,8	0,8	0,7	0,6
1,0	1,0	0,8	0,8
1,0	0,7	0,5	1,3

0,5	1,0	2,0	1,7
1,3	0,8	0,7	2,0
0,8	0,8	1,0	1,0
1,3	0,5	0,7	1,5
1,0	0,8	0,9	1,0
1,0	0,8	0,8	
0,3	1,2	0,8	
1,0	1,2	0,7	
1,0	1,3	0,8	
	1,0	0,5	
	2,0	0,6	
	0,9	0,8	
	0,5	1,0	
	0,8	0,8	
	0,8	1,0	
	1,0	0,7	
	0,8	1,0	
	1,0	0,5	
	1,0	1,0	
	0,8	0,7	
	1,0	0,5	
	0,4	0,7	
	0,4	1,0	
	2,0	1,3	
	2,0		
	2,0		
	0,8		
	0,8		
	0,8		

	0,8		
	0,5		
	1,0		
	1,0		







Summary Statistics for a

Count = 21

Average = 1,02381

Variance = 0,150905

Standard deviation = 0,388465

Minimum = 0,4

Maximum = 2,0

Range = 1,6

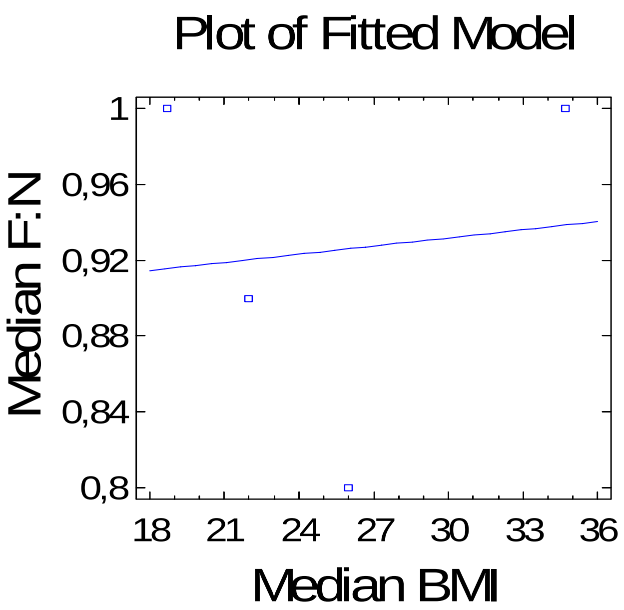
Stnd. skewness = 1,42705

Stnd. kurtosis = 0,841207

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is within the range expected for data from a normal distribution. The standardized kurtosis value is within the range expected for data from a normal distribution.

1.1.5.4.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N

Independent variable: Median BMI

Standard T

Parameter	Estimate	Error	Statistic	P-Value
Intercept	0,888733	0,253789	3,50186	0,0728
Slope	0,00143067	0,0097435	0,146833	0,8967

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,000293286	1	0,000293286	0,02	0,8967
Residual	0,0272067	2	0,0136034		
Total (Corr.)	0,0275	3			

Correlation Coefficient = 0,103271
R-squared = 1,0665 percent
R-squared (adjusted for d.f.) = -48,4003 percent
Standard Error of Est. = 0,116633
Mean absolute error = 0,0730686
Durbin-Watson statistic = 2,10683 (P=0,0818)
Lag 1 residual autocorrelation = -0,254471

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

Median F:N = 0,888733 + 0,00143067*Median BMI

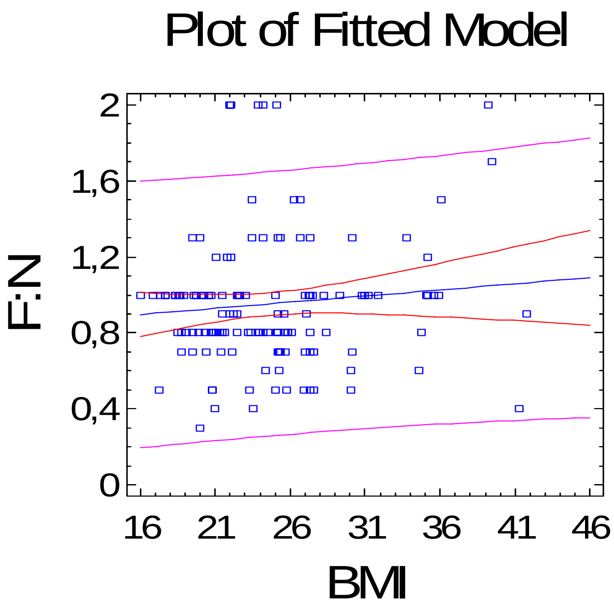
Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between Median F:N and Median BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains

1,0665% of the variability in Median F:N. The correlation coefficient equals 0,103271, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,116633. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,0730686 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.5.4.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Standard T

Parameter	Estimate	Error	Statistic	P-Value
Intercept	0,792204	0,144245	5,49207	0,0000
Slope	0,00650493	0,00572114	1,137	0,2576

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,158419	1	0,158419	1,29	0,2576
Residual	16,2982	133	0,122543		
Total (Corr.)	16,4566	134			

Correlation Coefficient = 0,0981147

R-squared = 0,962649 percent

R-squared (adjusted for d.f.) = 0,218008 percent

Standard Error of Est. = 0,350061

Mean absolute error = 0,246777

Durbin-Watson statistic = 1,72082 (P=0,0525)

Lag 1 residual autocorrelation = 0,138902

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 0,792204 + 0,00650493*BMI

Since the P-value in the ANOVA table is greater or equal to 0.10, there is not a statistically significant relationship between F:N and BMI at the 90% or higher confidence level.

The R-Squared statistic indicates that the model as fitted explains 0,962649% of the variability in F:N. The correlation coefficient equals 0,0981147, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,350061. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,246777 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.5.4.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model Correlation R-Squared

Linear	0,1033	1,07%
Square root-Y	0,0988	0,98%
Exponential	0,0943	0,89%
Double reciprocal	-0,0910	0,83%
Reciprocal-Y	-0,0852	0,73%
S-curve	0,0834	0,70%
Reciprocal-X	0,0758	0,57%
Square root-X	0,0595	0,35%
Logarithmic-X	0,0146	0,02%
Multiplicative	0,0062	0,00%
Logistic	<no fit>	
Log probit	<no fit>	

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the linear model yields the highest R-Squared value with 1,0665%. This is the currently selected model.

1.1.5.4.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 1,0

Median of sample 2: 1,0

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

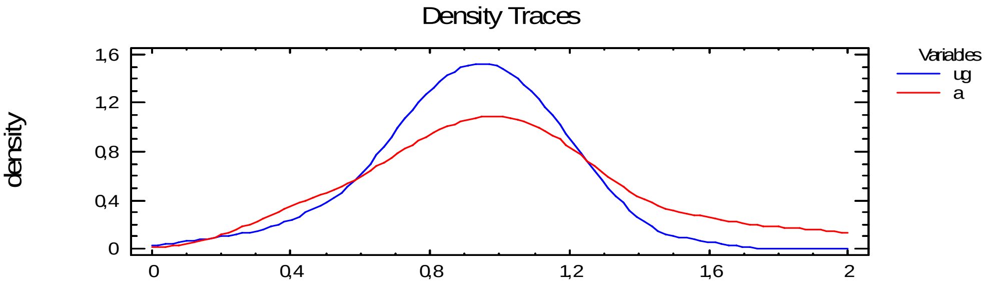
Average rank of sample 1: 22,04

Average rank of sample 2: 25,2381

W = 299,0   P-value = 0,399422

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.



Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,586667
Two-sided large sample K-S statistic = 1,98195
Approximate P value = 0,000774661

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,586667, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is less than 0,05, there is a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.5.4.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	0,348199	3	0,116066	0,94	0,4215
Within groups	16,1084	131	0,122965		
Total (Corr.)	16,4566	134			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 0,9439, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

Count Mean Homogeneous Groups

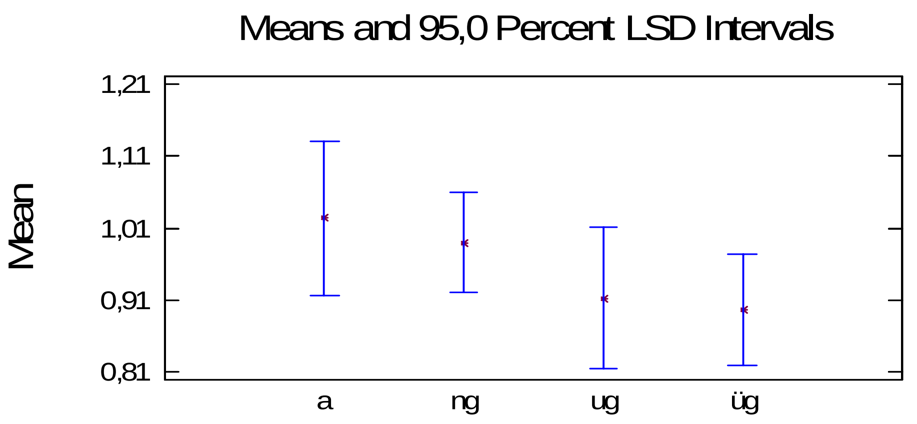
üg	40	0,895	X
ug	25	0,912	X
ng	49	0,989796	X
a	21	1,02381	X

Contrast	Difference	+/- Limits
a - ng	0,0340136	0,18093
a - ug	0,11181	0,205338
a - üg	0,12881	0,186937
ng - ug	0,0777959	0,170497
ng - üg	0,0947959	0,147821
ug - üg	0,017	0,176859

* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. There are no statistically significant differences between any pair of means at the 95,0% confidence level. At the top of the page, one homogenous group is identified by a column of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.5.4.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 0,9

Median of sample 2: 1,0

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 66,1974

Average rank of sample 2: 77,7857

W = 1402,5   P-value = 0,204422

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	0,126129	1	0,126129	1,03	0,3127
Within groups	16,3305	133	0,122785		
Total (Corr.)	16,4566	134			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 1,02723, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a

statistically significant difference between the means of the 2 variables at the 95,0% confidence level.

1.1.5.4.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

- Alter
- BMI
- EGew
- EWeise
- F
- F:N
- Händer
- Hunger
- Krankh
- N
- Status

Data input: observations

Number of complete cases: 135

Missing value treatment: listwise

Standardized: yes

Number of components extracted: 5

Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,46437	22,403	22,403
2	1,89846	17,259	39,662
3	1,30704	11,882	51,544
4	1,17573	10,688	62,233
5	1,05747	9,613	71,846
6	0,892572	8,114	79,960

7	0,812699	7,388	87,349
8	0,737548	6,705	94,054
9	0,507477	4,613	98,667
10	0,0897407	0,816	99,483
11	0,0568897	0,517	100,000

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The StatAdvisor

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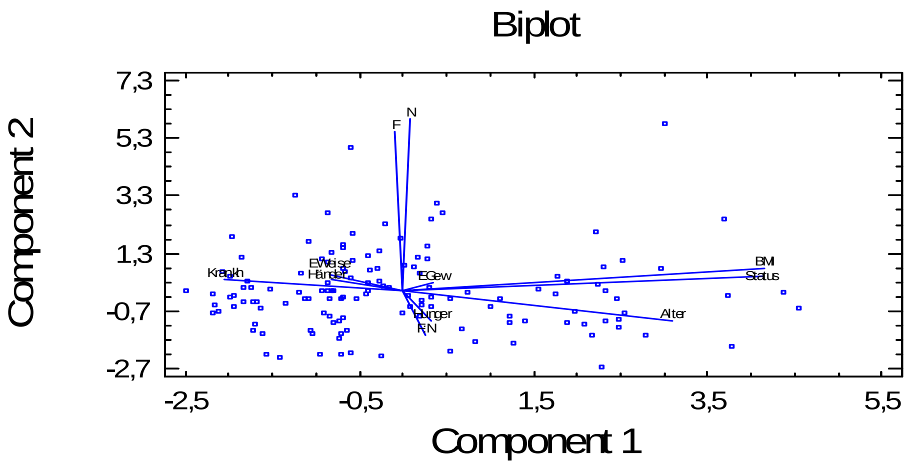
This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 11 variables which account for most of the variability in the data. In this case, 5 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 71,8461% of the variability in the original data.



1.1.5.5 Schnitzel mit Pommes und Salat

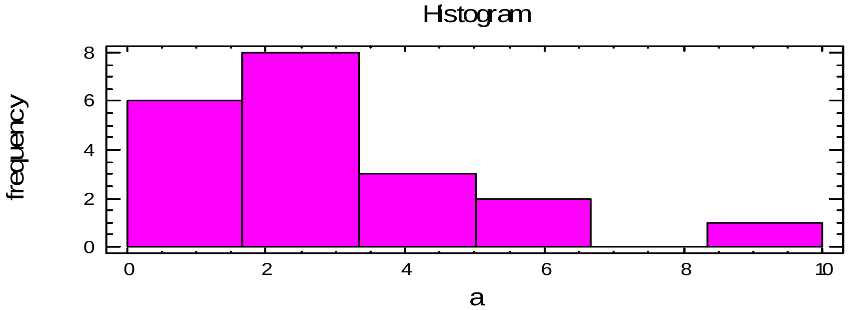
1.1.5.5.1 Prüfung auf Normalverteilung

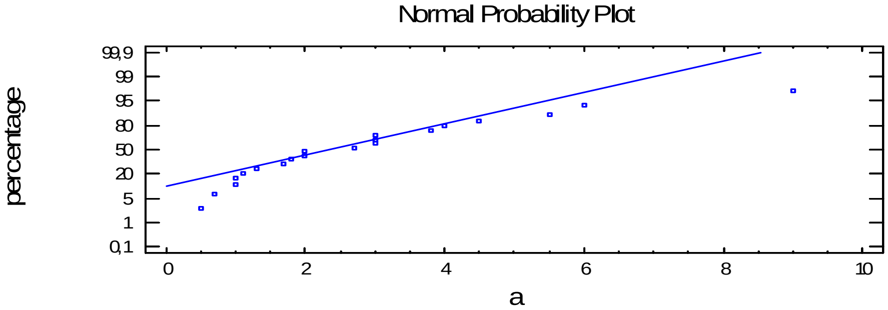
Tabelle 25: Fett – Nichtfett –Verhältnis – Observation Count der vier Gruppen - Schnitzel mit Pommes und Salat

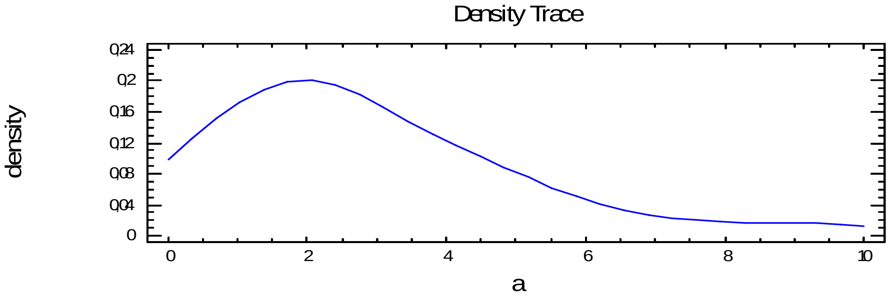
ug	ng	üg	a
3,5	5,0	2,0	2,7
1,5	2,5	2,3	
3,0	1,0	1,8	1,0

1,7	2,5	4,0	5,5
1,8	1,0	1,5	4,5
2,0	1,7	5,0	3,8
2,4	2,5	2,5	1,1
1,4	1,0	5,0	2,0
1,0	2,4	1,0	6,0
2,0	0,5	1,4	3,0
1,2	1,7	3,0	3,0
2,3	1,6	3,7	4,0
2,7	2,0	2,3	9,0
1,0	1,8	1,2	2,0
4,0	1,0	1,3	1,0
3,0	4,0	3,3	0,5
2,0	1,8	2,5	1,3
1,4	2,0	1,8	1,7
3,7	1,8	3,7	0,7
1,5	2,0	2,5	3,0
1,8	2,8	4,0	1,8
2,4	2,8	3,7	
2,3	2,0	1,3	
	2,2	2,0	
	1,2	3,3	
	1,0	2,0	
	2,0	2,0	
	2,4	2,0	
	1,0	1,5	
	1,5	1,2	
	3,7	2,0	
	1,2	1,5	

	2,0	1,0	
	1,0	2,0	
	0,8	3,0	
	1,8	3,5	
	2,0	2,3	
	1,6	1,5	
	1,4	1,3	
	2,0		
	1,0		
	1,0		
	2,5		
	3,3		
	3,0		
	4,0		
	5,0		
	1,0		







Summary Statistics for a

Count = 20

Average = 2,88

Variance = 4,53221

Standard deviation = 2,1289

Minimum = 0,5

Maximum = 9,0

Range = 8,5

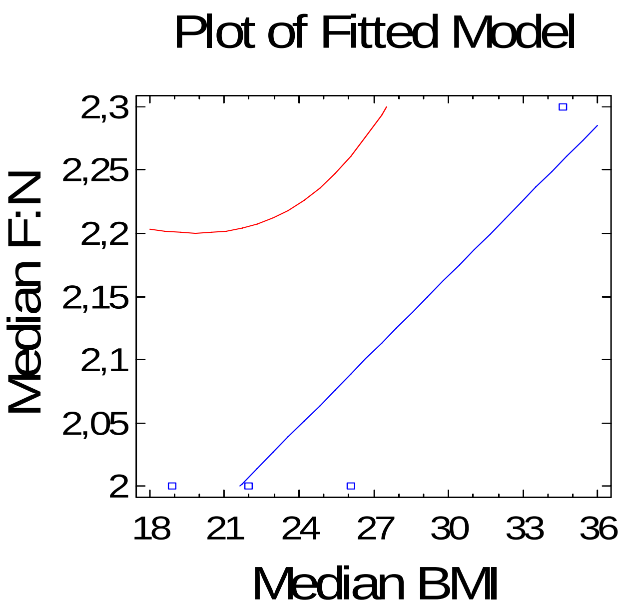
Stnd. skewness = 2,57865

Stnd. kurtosis = 2,08022

The StatAdvisor

This table shows summary statistics for a. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

1.1.5.5.2 Prüfung auf Linearität (Mediane)



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Median F:N

Independent variable: Median BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	1,57044	0,176092	8,91827	0,0123
Slope	0,0198647	0,00675334	2,94146	0,0988

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	0,0548265	1	0,0548265	8,65	0,0988
Residual	0,0126735	2	0,00633673		
Total (Corr.)	0,0675	3			

Correlation Coefficient = 0,901246

R-squared = 81,2245 percent

R-squared (adjusted for d.f.) = 71,8368 percent
Standard Error of Est. = 0,0796036
Mean absolute error = 0,0481827
Durbin-Watson statistic = 2,17982 (P=0,0647)
Lag 1 residual autocorrelation = -0,275875

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Median F:N and Median BMI. The equation of the fitted model is

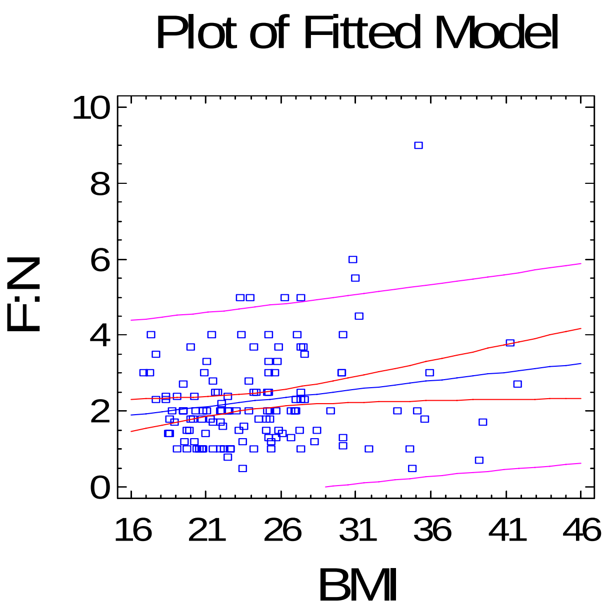
Median F:N = 1,57044 + 0,0198647*Median BMI

Since the P-value in the ANOVA table is less than 0.10, there is a statistically significant relationship between Median F:N and Median BMI at the 90% confidence level.

The R-Squared statistic indicates that the model as fitted explains 81,2245% of the variability in Median F:N. The correlation coefficient equals 0,901246, indicating a relatively strong relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 0,0796036. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,0481827 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

1.1.5.5.3 Prüfung auf Linearität



Regression Analysis - Linear model: Y = a + b*X

Dependent variable: F:N

Independent variable: BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	1,16022	0,536014	2,16452	0,0323
Slope	0,0455748	0,0213003	2,13963	0,0343

Analysis of Variance

Source Sum of Squares Df Mean Square F-Ratio P-Value

Model	7,10202	1	7,10202	4,58	0,0343
Residual	200,121	129	1,55133		

Total (Corr.)	207,223	130

Correlation Coefficient = 0,185128

R-squared = 3,42724 percent

R-squared (adjusted for d.f.) = 2,67861 percent

Standard Error of Est. = 1,24552

Mean absolute error = 0,920115

Durbin-Watson statistic = 1,6751 (P=0,0314)

Lag 1 residual autocorrelation = 0,14116

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between F:N and BMI. The equation of the fitted model is

F:N = 1,16022 + 0,0455748*BMI

Since the P-value in the ANOVA table is less than 0.05, there is a statistically significant relationship between F:N and BMI at the 95% confidence level.

The R-Squared statistic indicates that the model as fitted explains 3,42724% of the variability in F:N. The correlation coefficient

equals 0,185128, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 1,24552. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 0,920115 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation. Plot the residuals versus row order to see if there is any pattern which can be seen.

1.1.5.5.4 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Square root-Y	0,9012	81,22%
Exponential	0,9012	81,22%
Reciprocal-Y	-0,9012	81,22%
Linear	0,9012	81,22%
Square root-X	0,8822	77,83%
Logarithmic-X	0,8610	74,14%
Multiplicative	0,8610	74,14%
Reciprocal-X	-0,8133	66,14%
S-curve	-0,8133	66,14%
Double reciprocal	0,8133	66,14%
Logistic	<no fit>	
Log probit	<no fit>	

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the square root-Y model yields the highest R-Squared value with 81,2245%. This is 2,84217E-14% higher than the currently selected linear model. To change models, select the Analysis Options dialog box.

1.1.5.5.5 Paarweiser Vergleich

Comparison of Medians

Median of sample 1: 2,0

Median of sample 2: 2,35

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

Average rank of sample 1: 20,8043

Average rank of sample 2: 23,375

W = 257,5   P-value = 0,509926

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.

Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,319565
Two-sided large sample K-S statistic = 1,04521
Approximate P value = 0,22513

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,319565, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the two distributions at the 95,0% confidence level.

1.1.5.5.6 Multipler Vergleich

ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	11,2575	3	3,7525	2,43	0,0681
Within groups	195,966	127	1,54304		

Total (Corr.) 207,223 130

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 2,4319, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is greater than or equal to 0,05, there is not a statistically significant difference between the means of the 4 variables at the 95,0% confidence level.

Multiple Range Tests

Method: 95,0 percent LSD

	Count	Mean	Homogeneous Groups
ng	49	2,02041	X
ug	23	2,15652	XX
üg	39	2,38205	XX
a	20	2,88	X

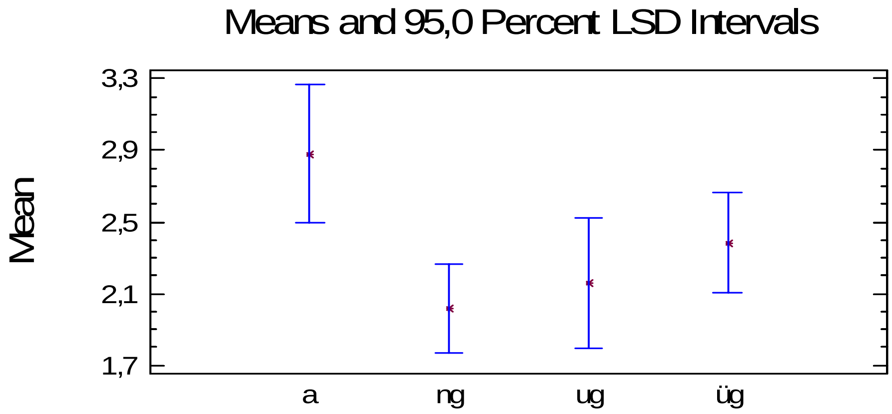
Contrast	Difference	+/- Limits
a - ng	*0,859592	0,652239
a - ug	0,723478	0,751537
a - üg	0,497949	0,676042
ng - ug	-0,136114	0,621297
ng - üg	-0,361643	0,52748
ug - üg	-0,22553	0,646241

----

* denotes a statistically significant difference.

The StatAdvisor

This table applies a multiple comparison procedure to determine which means are significantly different from which others. The bottom half of the output shows the estimated difference between each pair of means. An asterisk has been placed next to 1 pair, indicating that this pair shows a statistically significant difference at the 95,0% confidence level. At the top of the page, 2 homogenous groups are identified using columns of X's. Within each column, the levels containing X's form a group of means within which there are no statistically significant differences. The method currently being used to discriminate among the means is Fisher's least significant difference (LSD) procedure. With this method, there is a 5,0% risk of calling each pair of means significantly different when the actual difference equals 0.



1.1.5.5.7 Paarweiser Vergleich (Adipöse vs. Nicht-Adipöse)

Comparison of Medians

Median of sample 1: 2,0

Median of sample 2: 2,35

Mann-Whitney (Wilcoxon) W test to compare medians

Null hypothesis: median1 = median2

Alt. hypothesis: median1 NE median2

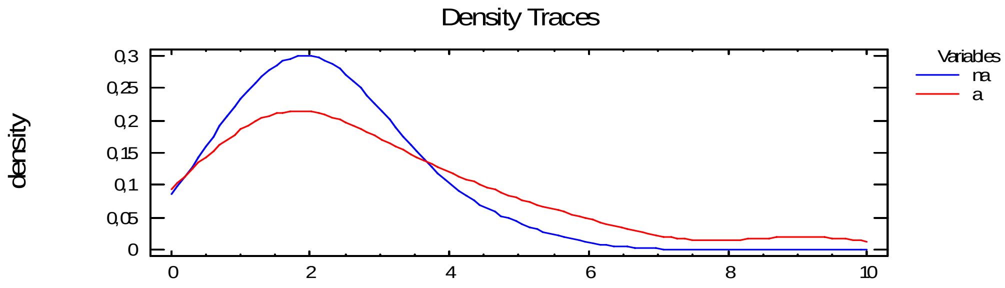
Average rank of sample 1: 64,6937

Average rank of sample 2: 73,25

W = 1255,0   P-value = 0,353393

The StatAdvisor

This option runs a Mann-Whitney W test to compare the medians of the two samples. This test is constructed by combining the two samples, sorting the data from smallest to largest, and comparing the average ranks of the two samples in the combined data. Since the P-value is greater than or equal to 0,05, there is not a statistically significant difference between the medians at the 95,0% confidence level.



ANOVA Table

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	8,40673	1	8,40673	5,45	0,0211
Within groups	198,816	129	1,54121		
Total (Corr.)	207,223	130			

The StatAdvisor

The ANOVA table decomposes the variance of the data into two components: a between-group component and a within-group component. The F-ratio, which in this case equals 5,45462, is a ratio of the between-group estimate to the within-group estimate. Since the P-value of the F-test is less than 0,05, there is a statistically significant difference between the means of the 2 variables at the 95,0% confidence level. To determine which means are significantly different from which others, select Multiple Range Tests from the list of Tabular Options.

1.1.5.5.8 Hauptkomponentenanalyse

Analysis Summary

Data variables:

- Alter
- BMI
- EGew
- EWeise
- F:N
- F_Pommes

F_Schnitzel
Händer
Hunger
Krankh
N
Status

Data input: observations
Number of complete cases: 131
Missing value treatment: listwise
Standardized: yes

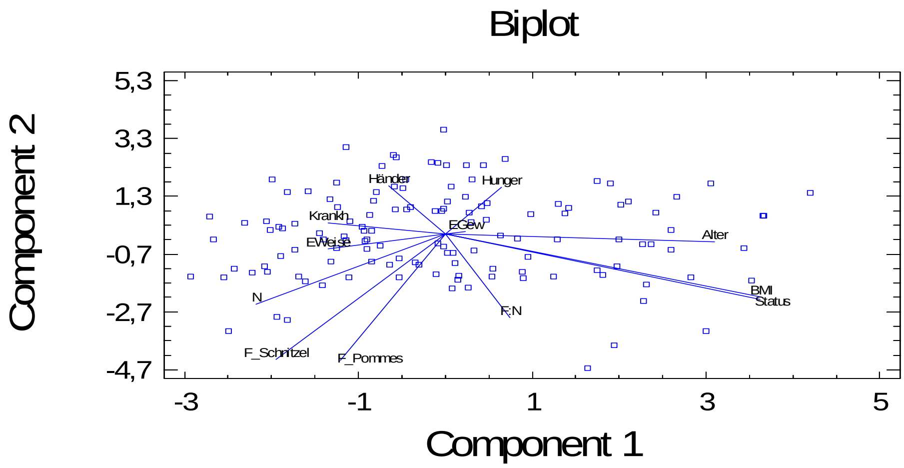
Number of components extracted: 4

Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,57855	21,488	21,488
2	2,2648	18,873	40,361
3	1,53807	12,817	53,179
4	1,20067	10,006	63,184
5	0,976351	8,136	71,320
6	0,937724	7,814	79,135
7	0,800123	6,668	85,802
8	0,762918	6,358	92,160
9	0,474609	3,955	96,115
10	0,313348	2,611	98,726
11	0,0820861	0,684	99,410
12	0,0707495	0,590	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 12 variables which account for most of the variability in the data. In this case, 4 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 63,1841% of the variability in the original data.



1.1.6 Fixation Before

1.1.6.1 Hamburger und Birne

1.1.6.1.1 Hauptkomponentenanalyse

Analysis Summary

Data variables:

Alter

AOI_1

AOI_2

AOI_3

AOI_4

AOI_5

AOI_6

AOI_7

AOI_8

Birne

BMI

EGew

EWeise

F

F:N

Hamb

Hamb:Birne

Händer

Hunger

Krankh

N

Status

Data input: observations

Number of complete cases: 125

Missing value treatment: listwise

Standardized: yes

Number of components extracted: 7

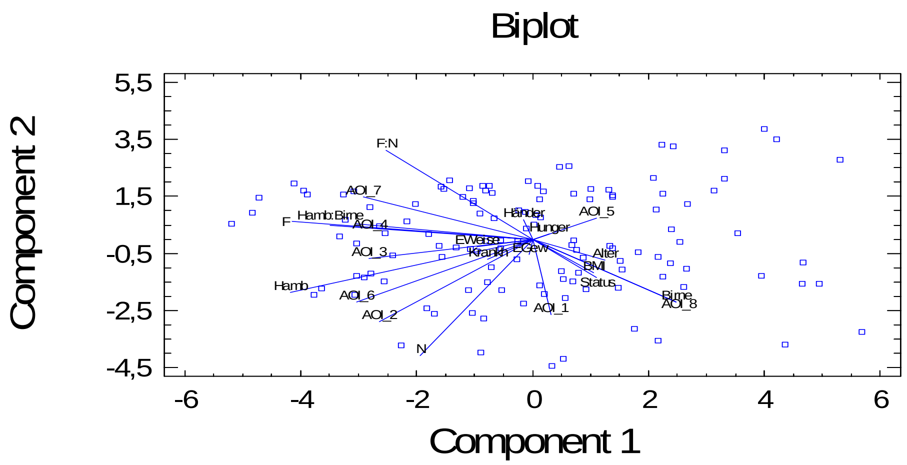
Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	5,41185	24,599	24,599
2	3,19905	14,541	39,140
3	2,6342	11,974	51,114
4	1,65731	7,533	58,647
5	1,3055	5,934	64,581
6	1,12099	5,095	69,677
7	1,01704	4,623	74,300
8	0,977548	4,443	78,743
9	0,957934	4,354	83,097
10	0,75574	3,435	86,533
11	0,670974	3,050	89,582
12	0,554016	2,518	92,101
13	0,543245	2,469	94,570
14	0,474534	2,157	96,727
15	0,34008	1,546	98,273
16	0,244813	1,113	99,386
17	0,0885204	0,402	99,788
18	0,0466644	0,212	100,000
19	9,54731E-16	0,000	100,000
20	6,01167E-16	0,000	100,000
21	2,25982E-16	0,000	100,000
22	0,0	0,000	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 22 variables which account for most of the variability in the data. In this case, 7 components have been extracted, since 2090115364 components had eigenvalues greater than or

equal to 1,0. Together they account for 74,2997% of the variability in the original data.



1.1.6.2 Praline und Erdbeere

1.1.6.2.1   Hauptkomponentenanalyse

Analysis Summary

Data variables:

Alter

BMI

EGew

EWeise

F

Händer

Hunger

Krankh

N

Status

Data input: observations

Number of complete cases: 132

Missing value treatment: listwise

Standardized: yes

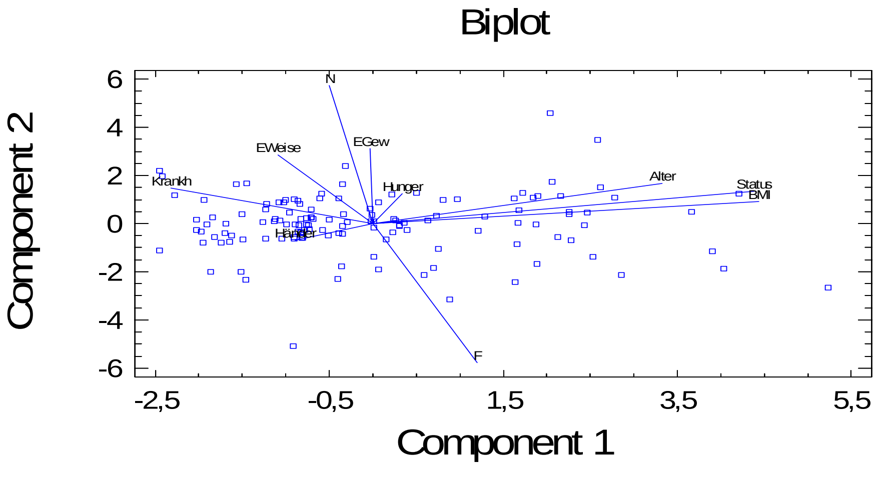
Number of components extracted: 4

Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,50824	25,082	25,082
2	1,53864	15,386	40,469
3	1,13736	11,374	51,842
4	1,09051	10,905	62,748
5	0,949959	9,500	72,247
6	0,854911	8,549	80,796
7	0,786424	7,864	88,661
8	0,566811	5,668	94,329
9	0,48406	4,841	99,169
10	0,0830772	0,831	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 10 variables which account for most of the variability in the data. In this case, 4 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 62,7476% of the variability in the original data.



1.1.6.3 Chips und Weintrauben

1.1.6.3.1 Hauptkomponentenanalyse

Analysis Summary

Data variables:

Alter
BMI
EGew
EWeise
F
Händer
Hunger
Krankh
N
Status

Data input: observations
Number of complete cases: 130
Missing value treatment: listwise
Standardized: yes

Number of components extracted: 4

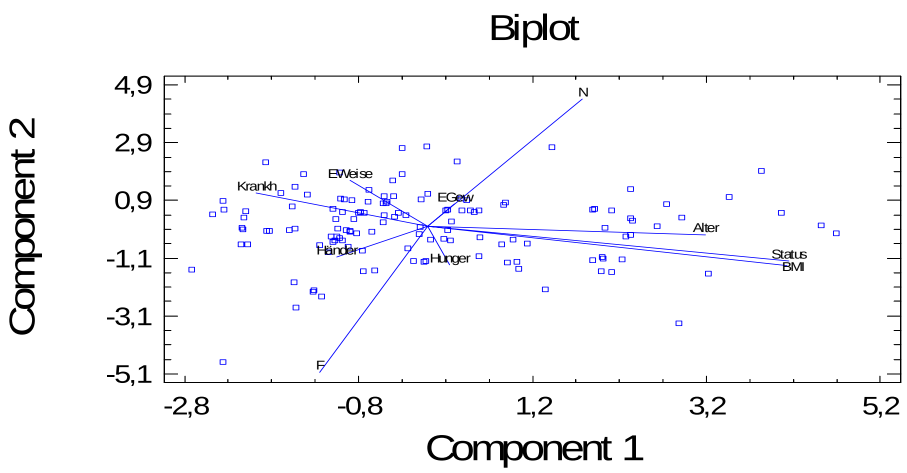
Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,57383	25,738	25,738
2	1,41194	14,119	39,858
3	1,19776	11,978	51,835
4	1,09566	10,957	62,792
5	0,950729	9,507	72,299
6	0,874609	8,746	81,045
7	0,78029	7,803	88,848
8	0,56704	5,670	94,519
9	0,461217	4,612	99,131

10 0,0869265 0,869 100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 10 variables which account for most of the variability in the data. In this case, 4 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 62,7919% of the variability in the original data.



1.1.6.4 Bananen und Schokolade

1.1.6.4.1 Hauptkomponentenanalyse

Analysis Summary

Data variables:

Alter

BMI

EGew

EWeise

F

Händer

Hunger

Krankh

N
Status

Data input: observations
Number of complete cases: 135
Missing value treatment: listwise
Standardized: yes

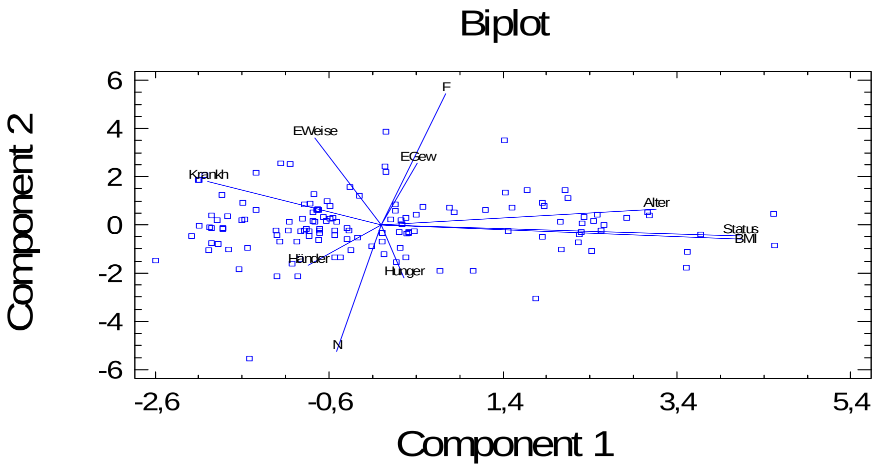
Number of components extracted: 4

Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,48015	24,802	24,802
2	1,42225	14,223	39,024
3	1,14229	11,423	50,447
4	1,13707	11,371	61,818
5	0,907453	9,075	70,892
6	0,895692	8,957	79,849
7	0,788179	7,882	87,731
8	0,630217	6,302	94,033
9	0,515212	5,152	99,185
10	0,0814797	0,815	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 10 variables which account for most of the variability in the data. In this case, 4 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 61,8177% of the variability in the original data.



1.1.6.5 Schnitzel mit Pommes und Salat

1.1.6.5.1 Hauptkomponentenanalyse

Analysis Summary

Data variables:

- Alter
- BMI
- EGew
- EWeise
- F:N
- F_Pommes
- F_Schnitzel
- Händer
- Hunger
- Krankh
- N
- Status

Data input: observations

Number of complete cases: 118

Missing value treatment: listwise

Standardized: yes

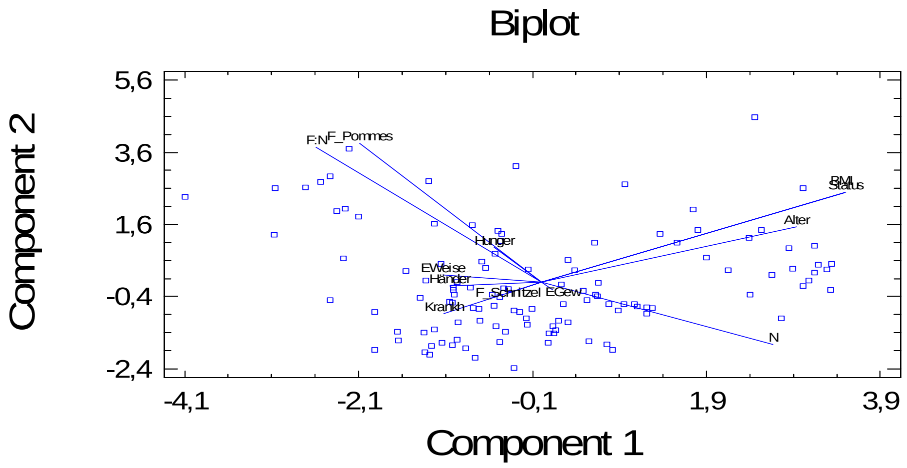
Number of components extracted: 5

Principal Components Analysis

Component Number	Eigenvalue	Percent of Variance	Cumulative Percentage
1	2,69626	22,469	22,469
2	2,00678	16,723	39,192
3	1,36604	11,384	50,576
4	1,11711	9,309	59,885
5	1,01759	8,480	68,365
6	0,970637	8,089	76,453
7	0,836995	6,975	83,428
8	0,779933	6,499	89,928
9	0,603582	5,030	94,958
10	0,448399	3,737	98,694
11	0,0868156	0,723	99,418
12	0,0698653	0,582	100,000

The StatAdvisor

This procedure performs a principal components analysis. The purpose of the analysis is to obtain a small number of linear combinations of the 12 variables which account for most of the variability in the data. In this case, 5 components have been extracted, since 2090115364 components had eigenvalues greater than or equal to 1,0. Together they account for 68,3648% of the variability in the original data.


Biplot
Component 2
5,6
3,6
1,6
-0,4
-2,4
-4,1
-2,1
-0,1
1,9
3,9
Component 1
F:N
F_Pommes
BMI
Status
Alter
Hunger
EWeise
Händer
F_Schnitzel
EGew
Krankh
N

1.2 Alter und BMI

1.2.1 Prüfung auf Linearität

Regression Analysis - Linear model: Y = a + b*X

Dependent variable: Alter

Independent variable: BMI

Parameter	Estimate	Standard Error	T Statistic	P-Value
Intercept	0,723672	4,89985	0,147693	0,8828
Slope	1,18182	0,192689	6,13328	0,0000

Es wurde mit den Mittelwerten der Fett – Nichtfett – Verhältnisse der einzelnen Gruppen gerechnet.

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Model	5032,14	1	5032,14	37,62	0,0000
Residual	17256,7	129	133,773		
Total (Corr.)	22288,8	130			

Correlation Coefficient = 0,475153

R-squared = 22,577 percent

R-squared (adjusted for d.f.) = 21,9768 percent

Standard Error of Est. = 11,566

Mean absolute error = 7,92245

Durbin-Watson statistic = 1,53925 (P=0,0039)

Lag 1 residual autocorrelation = 0,21716

The StatAdvisor

The output shows the results of fitting a linear model to describe the relationship between Alter and BMI. The equation of the fitted model is

Alter = 0,723672 + 1,18182*BMI

Since the P-value in the ANOVA table is less than 0.01, there is a statistically significant relationship between Alter and BMI at the 99% confidence level.

The R-Squared statistic indicates that the model as fitted explains 22,577% of the variability in Alter. The correlation coefficient equals 0,475153, indicating a relatively weak relationship between the variables. The standard error of the estimate shows the standard deviation of the residuals to be 11,566. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu.

The mean absolute error (MAE) of 7,92245 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is less than 0.05, there is an indication of possible serial correlation. Plot the residuals versus row order to see if there is any pattern which can be seen.

1.2.2 Vergleich von alternativen Modellen

Comparison of Alternative Models

Model	Correlation	R-Squared
Reciprocal-Y	-0,5156	26,58%
Multiplicative	0,5132	26,34%
Exponential	0,5096	25,97%
Double reciprocal	0,5076	25,77%

S-curve	-0,5051	25,51%
Square root-Y	0,4959	24,59%
Logarithmic-X	0,4808	23,12%
Square root-X	0,4794	22,98%
Reciprocal-X	-0,4752	22,58%
Linear	0,4752	22,58%
Logistic	<no fit>	
Log probit	<no fit>	

The StatAdvisor

This table shows the results of fitting several curvilinear models to the data. Of the models fitted, the reciprocal-Y model yields the highest R-Squared value with 26,5808%. This is 4,00377% higher than the currently selected linear model. To change models, select the Analysis Options dialog box.

1.2.3 Paarweiser Vergleich: Alter – BMI

Kolmogorov-Smirnov Test

Estimated overall statistic DN = 0,217054

Two-sided large sample K-S statistic = 1,7432

Approximate P value = 0,00458772

The StatAdvisor

This option runs a Kolmogorov-Smirnov test to compare the distributions of the two samples. This test is performed by computing the maximum distance between the cumulative distributions of the two samples. In this case, the maximum distance is 0,217054, which you can see visually by selecting Quantile Plot from the list of Graphical Options. Of particular interest is the approximate P-value for the test. Since the P-value is less than 0,05, there is a statistically significant difference between the two distributions at the 95,0%

confidence level.

2. Urdaten

Die Urdaten sind die Excel-Tabellen, die sich ebenfalls auf der CD befinden.