

Fettverbrennung

Übergeordnet

Metabolismus der
Fettsäuren
Fettstoffwechsel

Untergeordnet

α -Oxidation
 β -Oxidation
 ω -Oxidation

Gene Ontology

QuickGO ^[1]

Als **Fettverbrennung**, genauer **Fettsäureoxidation**, werden allgemein diejenigen chemischen Reaktionen verstanden, bei denen eine Fettsäure durch die Reaktion mit einem Elektronenakzeptor ein oder mehrere Elektronen abgibt. Zusätzlich werden in der Biochemie unter dem Begriff Fettsäureoxidation die Stoffwechselwege α -Oxidation, β -Oxidation und ω -Oxidation zusammengefasst, die Teil der Energiebereitstellung des Körpers sind.

Bei der Fettverdauung werden Fettsäuren durch Aufspaltung von Fett gewonnen. Daraufhin werden sie dem Fettstoffwechsel zugeführt und stehen dem Körper für den Energieumsatz zur Verfügung. Das Fett kann dabei sowohl der Nahrung als auch dem körpereigenen Fettgewebe entstammen. Der Brennwert reinen Fettes beträgt 39 kJ/g oder 9,3 kcal/g. Fettgewebe besteht nicht zu 100 % aus Fett, erreicht daher lediglich einen Brennwert von etwa 29 kJ/g oder 7 kcal/g. Um ein Kilogramm Fettgewebe auf- oder abzubauen, ist also eine Differenz zum restlichen Energiebedarf von 29.000 kJ bzw. 7.000 kcal nötig.

Die Fettverbrennung ist ein im Körper ständig ablaufender, kontinuierlicher Vorgang. Das Ausmaß hängt vom Grad körperlicher Betätigung und damit vom Energiebedarf ab.

Studien zufolge verringert eine kohlenhydratreiche Ernährung durch den resultierenden höheren Insulinausstoß die Fettoxidation um bis zu 35 %, was noch sechs bis acht Stunden nach Einnahme einer Mahlzeit andauern kann.^[2]

Fettverbrennung im Sport

Von Sportlern und Medizinern wird häufig die Auffassung vertreten, der Körper bezöge bei körperlicher Belastung in einem bestimmten Intensitätsbereich seine Energie überwiegend aus dem gespeicherten Körperfett. Dieser Intensitätsbereich wäre individuell unterschiedlich, zwischen 60 und 75 % der individuellen Maximalleistung werden angegeben. Während zuerst überwiegend Glucose verstoffwechselt würde, stiege die Fettverbrennung innerhalb der ersten halben Stunde nach Trainingsbeginn auf einen bestimmten, für die Intensität charakteristischen Wert.

Die Auffassung, zu Beginn des Trainings würde zunächst überwiegend Glucose verbrannt, ist inzwischen umstritten. Aktuell geht man davon aus, dass der Anteil der Fettverbrennung ausschließlich von der Stärke der Belastung und vom allgemeinen Trainingszustand abhängt.^[3]

Fachstudien zufolge hängt die Fettverbrennung durch Sport von mehreren Faktoren ab, unter anderem vom Grad der Sportlichkeit des Körpers und der Entfaltung der Muskeln. Männer verbrennen bei gleicher Belastungsintensität weniger als Frauen. Übergewicht und Insulinresistenz verringern den Verbrauch. In Studien war der Fettstoffwechsel Trainierter bei einer Belastungsintensität von 65 %, Untrainierter bei etwa 50 % der Maximalleistung am effektivsten.^[2]

Energie wird beim Sport, unabhängig von der Intensität, ab der ersten Minute verbraucht. Bei mäßiger Belastung ist der Verbrauch geringer als bei hoher. Für die Gewichtsreduktion ist nicht ausschlaggebend, wie viel Fett während der körperlichen Betätigung verbrannt worden ist, sondern die Energiebilanz, d. h. wie viel Energie insgesamt verbraucht wird.

Bei extensiver Belastung (z. B. Dauerlauf) besteht die aerobe Energiegewinnung aus Fett- und Kohlenhydratverbrennung (Oxidation freier Fettsäuren und der Glukose) von Beginn an, im Gegensatz zur sogenannten anaeroben Energiegewinnung bei kurzzeitigen Belastungsspitzen, z. B. beim Sprint. Beim Jogging oder beim Walking ist die Lipidoxidation Studien zufolge stärker als beim Radfahren.

Es gibt keine wissenschaftlichen Belege dafür, dass ein als Fatburner beworbenes Nahrungsergänzungsmittel die Fettverbrennung steigern würde.^[2]

Regelmäßiges sportliches Training ist die einzig effektive Möglichkeit, die Verstoffwechslung von Lipiden während körperlicher Belastung zu erhöhen. Insbesondere Ausdauertraining führt zu einer verbesserten Ausstattung der Muskeln mit Enzymen des Fettstoffwechsels. Darüber hinaus wird sowohl die Mitochondriendichte erhöht als auch der lokale Blutfluss verbessert, beides von günstigem Einfluss auf die Fettoxidation.^[2]

Quellen

[1] <http://www.ebi.ac.uk/QuickGO/GTerm?id=GO:0019395>

[2] Asker E. Jeukendrup: Fettverbrennung und körperliche Aktivität, in: Deutsche Zeitschrift für Sportmedizin, Nr. 9, 2005 (http://www.zeitschrift-sportmedizin.de/fileadmin/externe_websites/ext.dzsm/content/archiv2005/heft09/Standarts1.pdf) (PDF; 71 kB)

[3] Kurt A. Moosburger: "FETTVERBRENNUNG" IM SPORT: MYTHOS UND WAHRHEIT (<http://www.dr-moosburger.at/pub/pub031.pdf>) (PDF; 63 kB)

Weblinks

- Kritischer Beitrag von Dr. Kurt A. Moosburger zum Thema Fettverbrennung (pdf) (<http://www.dr-moosburger.at/pub/pub031.pdf>) (68 kB)
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