ASPARTAM
SICHERHEIT UND KALORIENREDUKTION

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Was sind Süßstoffe?

Entsprechend den EU-Regelungen sind Süßstoffe Lebensmittelzusatzstoffe, die

- verwendet werden, um Lebensmitteln einen süßen Geschmack zu verleihen oder
- als Tafelsüßen verwendet werden.

E-Nummer	Zusatzstoff
E 420	Sorbit
E 421	Mannit
E 953	Isomalt
E 965	Maltit
E 966	Lactit
E 967	Xylit
E 968	Erythrit
E 950	Acesulfam K
E 951	Aspartam
E 952	Cyclohexansulfamidsäure
E 954	Saccharin
E 955	Sucralose
E 957	Thaumatin
E 959	Neohesperidin DC
E 960	Steviolglykoside
E 961	Neotam

Was sind Süßstoffe?

Künstliche Süßstoffe (artifcial sweeteners) sind auf synthetischem Wege hergestellte, süßschmeckende Verbindungen. In der Regel versteht man hierunter Acesulfam K, Aspartam etc., wobei auch Zuckeralkohole synthetisch (aus Zuckern) hergestellt werden.

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Besser ist der Begriff „high intensity sweeteners" zur Abgrenzung gegenüber Zuckeraustauschstoffen.

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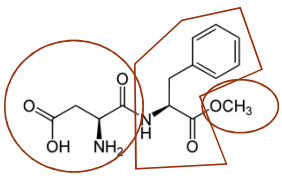
Aspartam



Asparagyl- Phenylalanin- methylester

Süßkraft: etwa 200 mal süßer als Saccharose

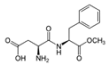
Aspartam: Zulassungen

Aspartam: Zulassungen

Lebensmittelkategorie	Einschränkungen	Höchstgehalt (mg/kg)
Aromatisierte fermentierte Milchprodukte, auch wärmebehandelt	Nur brennwertverminderte oder ohne Zuckerzusatz hergestellte Produkte	1000
Speiseeis	Nur brennwertverminderte oder ohne Zuckerzusatz hergestellte Produkte	800
Obst und Gemüse in Essig, Öl oder Lake	Nur süßsaure Obst- und Gemüsekonserven	300
Kaugummi	Nur ohne Zuckerzusatz	5500
Senf		350
Soßen		350
Aromatisierte Getränke	Nur brennwertverminderte oder ohne Zuckerzusatz hergestellte Produkte	600
Apfelwein und Birnenwein		600
Knabbereien auf Kartoffel-, Getreide-, Mehl- oder Stärkebasis		500
Nahrungsergänzungsmittel in fester Form, einschließlich Kapseln, Komprimaten und ähnlichen Formen, ausgenommen kaubare Formen		2000
Nahrungsergänzungsmittel in Form von Sirup oder in kaubarer Form		5500

SICHERHEIT VON ASPARTAM

Aspartam: Sicherheit



Derzeit erfolgt durch die EFSA eine Neubewertung (im Rahmen der Regulation 493 (EU) No 257/2010) aller zugelassenen Zusatzstoffe, somit auch Aspartam.

Aufgrund neuer Daten wurde die Neubewertung von Aspartam vorgezogen, ein Entwurf wurde einem öffentlichen Stellungnahmeverfahren unterzogen.

Die endgültige Stellungnahme ist für November 2013 vorgesehen.

efsa

ENDORSED FOR PUBLIC CONSULTATION

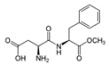
DRAFT SCIENTIFIC OPINION

DRAFT Scientific Opinion on the re-evaluation of aspartame (E 951) as a food additive

EFSA Panel on Food Additives and Nutrient Sources added to Food (ANS)

European Food Safety Authority (EFSA), Parma, Italy

Aspartam: Sicherheit



Das ANS-Panel sieht (nach derzeitigem Stand) keine Veranlassung, den bisherigen ADI von 40 mg/kg Körpergewicht zu ändern.

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ABSTRACT

The Panel on Food Additives and Nutrient Sources added to Food provides a scientific opinion re-evaluating the safety of aspartame (E951). Aspartame (E 951) is an artificial sweetener authorised as a food additive in the EU that was previously evaluated by JECFA, SCF and EFSA. JECFA and SCF established an ADI of 40 mg/kg bw/day. The Panel based its evaluation on original reports, previous evaluations, additional literature available since these evaluations and the data available following a public call for data. Aspartame is rapidly and completely hydrolysed in the gastrointestinal tract to methanol and the amino acids phenylalanine and aspartic acid. DKP is a degradation product of aspartame. The Panel concluded that chronic toxicity and reproductive and developmental toxicity were the critical endpoints in the animal database. The Panel considered that the evaluation of long-term effects of aspartame should continue to be based upon the animal data. Based on a MoA analysis and the weight-of-evidence, the Panel considered that the reproductive and developmental toxicity in animals was due to phenylalanine released from aspartame and concluded that the basis for evaluation of the reproductive and developmental endpoint should be the available data in humans. From the aspartame dose-plasma phenylalanine concentration response modelling, the Panel considered that aspartame intakes up to the ADI of 40 mg/kg bw/day in addition to phenylalanine from a meal would not lead to peak plasma phenylalanine concentrations above the current clinical guideline for prevention of adverse effects in the fetuses of PKU mothers. The Panel concluded that there were no safety concerns at the current ADI of 40 mg/kg bw/day. Therefore, there was no reason to revise the ADI for aspartame. Conservative estimates of exposure to aspartame and its degradation product DKP made by the Panel for the general population were below their respective ADIs.

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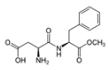
Aspartam: Sicherheit



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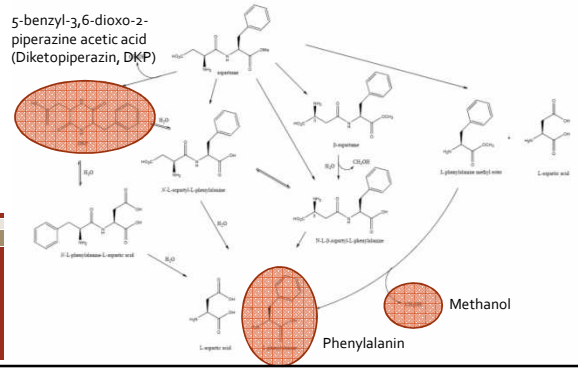
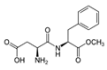
Aspartam: Metabolismus



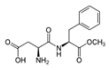
Aspartam: Sicherheit



Methanol:

In a weight-of-evidence approach, the Panel concluded that the data set was limited but that the available reliable *in vitro* and *in vivo* data did not indicate a genotoxic concern for methanol.
The Panel noted that for average consumers of aspartame, the contribution to the overall exposure to methanol ranged from 1% up to 10% across the EU general population. In this estimate, the Panel also noted that exposure to methanol from natural sources is a minor contributing source compared to exposure from endogenous pathways (less than 10%).
The Panel noted that the exposure from aspartame-derived methanol is similar to methanol exposure from natural sources.
The Panel concluded that there is no safety concern from the levels of methanol released from aspartame under the current uses and permitted use levels.

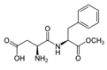
Aspartam: Sicherheit



DKP:

Overall, the Panel concluded that available data do not indicate a genotoxic concern for DKP.
DKP administration to mice for 110 weeks in the diet at dose levels up to 1000 mg/kg bw/day indicated neither a carcinogenic effect nor a treatment-related increase in non-neoplastic lesions at the doses tested. The Panel considered that the NOAEL was 1000 mg DKP/kg bw/day, the highest dose level tested.

Aspartam: Sicherheit

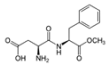


Phenylalanin:

The Panel considered the following:

- the conservative assumptions used in the modelling, which would all overestimate peak plasma concentrations,
- the available information on adverse effects in development in humans with PKU,
- comparison with a concentration of 240 µM to allow for simultaneous ingestion of phenylalanine from other components of the diet in order to not exceed the current clinical guideline of 360 µM
- results of the modelling
- data from repeated oral administration of aspartame in humans
- bolus intakes based on consumption of one litre of soft drink containing aspartame at the MPL of 600 mg/L by a child of 20-30 kg are unlikely to exceed 30 to 20 mg/kg bw, respectively.

Aspartam: Sicherheit



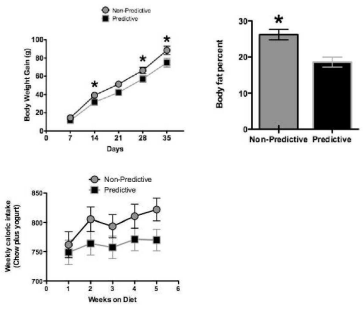
Phenylalanin:

Based on these considerations and evaluations, the Panel concluded that under realistic conditions, phenylalanine plasma levels would not exceed 240 µM in normal or PKU heterozygous individuals.
The Panel noted that this was considerably below the concentrations at which adverse effects in the fetus were reported and was also below the current clinical guideline (360 µM) for prevention of effects in the fetuses of pregnant PKU patients. The Panel noted that in young children who did not suffer from PKU, plasma levels of phenylalanine resulting from aspartame ingestion at or below the ADI (as either a bolus or other aspartame consumption patterns) were likely to remain below 240 µM.
For pregnant women, the Panel noted that there was no risk to the fetus from phenylalanine derived from aspartame at the current ADI (40 mg/kg bw/day) in normal or PKU heterozygous individuals.

AUSWIRKUNG VON HIGH-INTENSITY SWEETENERS AUF DAS ÜBERGEWICHT

High intensity sweeteners

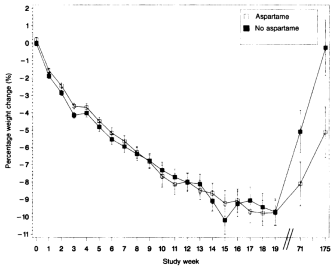
Hypothese: Der Gewöhnung an einen Süßgeschmack von Lebensmitteln ohne eine nachfolgende physiologische Reaktion (z.B. Blutglucosespiegel) führt zu einer Entkopplung des Triggers süß von Regulationsmecha-nismen der Energiebalance.



Swithers SE, Davidson TL. A role for sweet taste: calorie predictive relations in energy regulation by rats. Behav Neurosci. 2008 Feb;122(1):161-73.

High intensity sweeteners

High intensity sweeteners leisten einen Beitrag zur Reduktion der Energiezufuhr



Blackburn GL, Kanders BS, Lavin PT, Keller SD and Whatley J . The effect of aspartame as part of a multidisciplinary weight-control program on short- and long-term control of body weight. American Journal of Clinical Nutrition, Vol 65, 409-418

High intensity sweeteners

High intensity sweeteners leisten einen Beitrag zur Reduktion der Energiezufuhr


FROM THE ACADEMY
Position Paper

Position of the Academy of Nutrition and Dietetics: Use of Nutritive and Nonnutritive Sweeteners

High intensity sweeteners

High intensity sweeteners leisten einen Beitrag zur Reduktion der Energiezufuhr

Aspartame. *In adults, does using foods or beverages with aspartame in an energy-restricted or ad libitum diet affect energy balance (weight)?*

Conclusion Statement. Use of aspartame and aspartame-sweetened products as part of a comprehensive weight loss or maintenance program by individuals may be associated with greater weight loss and may assist individuals with weight maintenance over time. **Grade I=Good.**

Journal of the Academy of Nutrition and Dietetics. doi: 10.1016/j.jand.2012.03.009

High intensity sweeteners

High intensity sweeteners leisten einen Beitrag zur Reduktion der Energiezufuhr

In adults, does using foods or beverages with aspartame affect appetite or food intake?

Conclusion Statement. There is good evidence that aspartame does not affect appetite or food intake. **Grade I=Good.**

In children, does using foods or beverages with aspartame affect appetite or food intake?

Journal of the Academy of Nutrition and Dietetics. doi: 10.1016/j.jand.2012.03.009

WAS NUN?
PRAKTISCHE RELEVANZ

Ein Weg hinein oder hinaus?

Die Evidenz für einen Beitrag von High-intensity sweeteners zur Adipositas ist gering, während deren Verwendung im Rahmen einer Reduktionsdiät durchaus hilfreich sein können.

Die Evidenz für einen Beitrag von Fructose zur Adipositas ist fraglich, auch wenn es biochemische Zusammenhänge gibt. Die praktische Relevanz dieser Mechanismen ist allerdings gering.

Insgesamt besteht also kein Grund, auf andere Süßungsmöglichkeiten als Saccharose zu verzichten, langfristig wird aber nur eine dauerhaft wirksame Erhöhung der Ernährungskompetenz gemeinsam mit Optimierung im Bereich der Bewegung zum Ziel führen.

DANKE FÜR IHRE AUFMERKSAMKEIT!

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