

# Un Additif Attaqué: L'aspartame

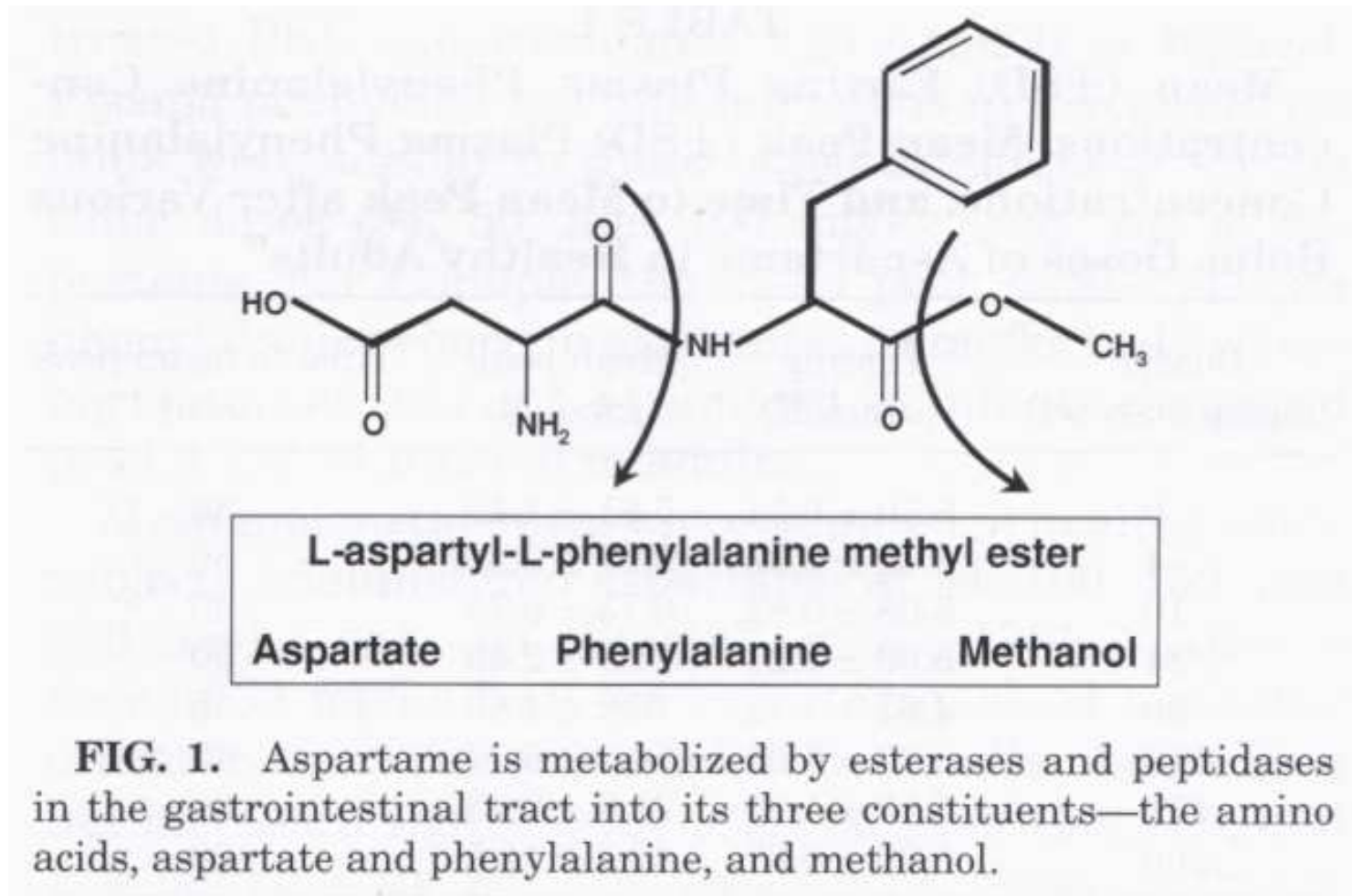
Congrès français de Toxicologie  
Montpellier 25-26.10.07

Hervé Nordmann  
Ajinomoto Co. Inc.

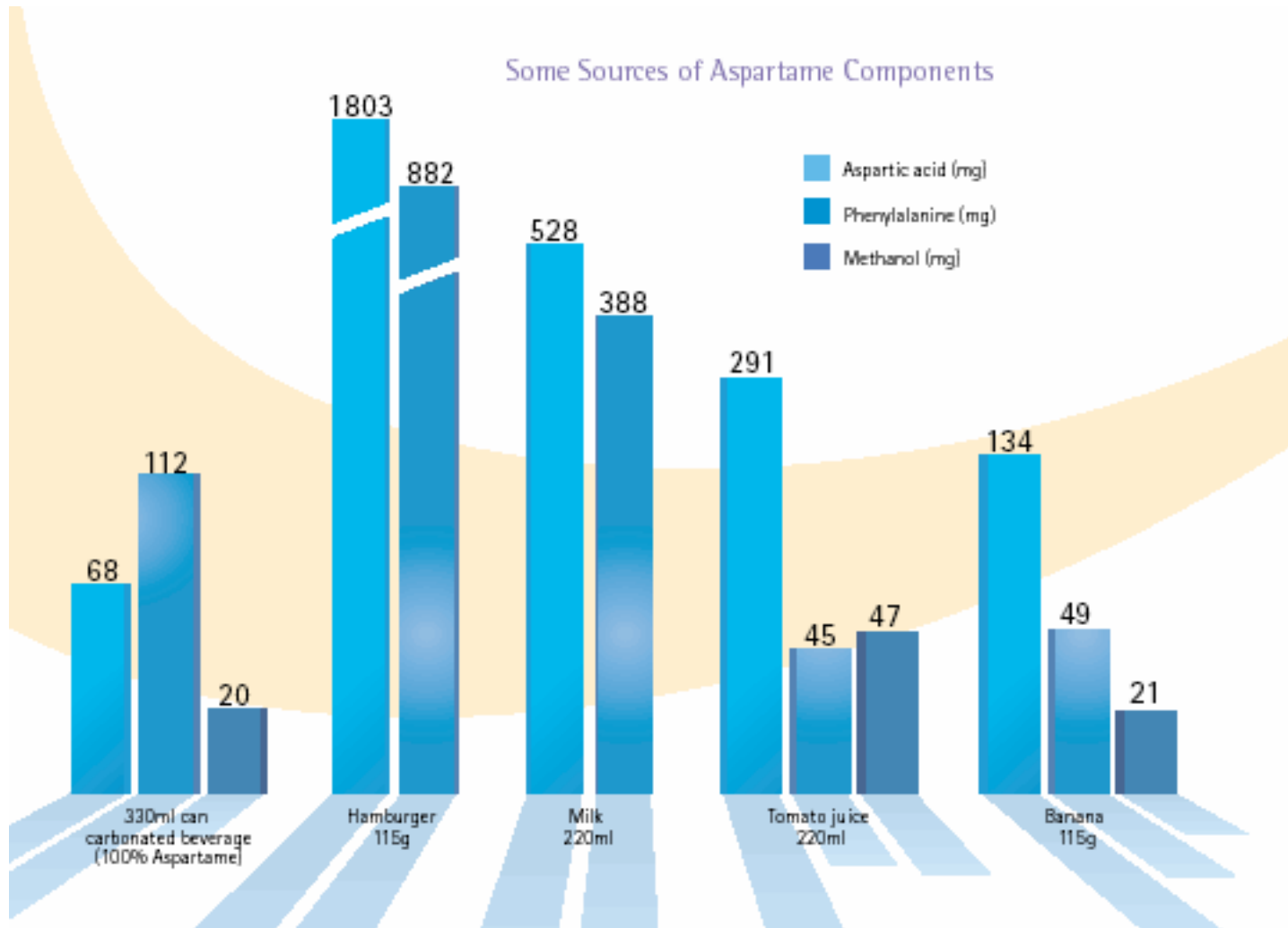
# Sommaire

- Sécurité
- Utilité
- Environnement
- Production
- Attaques:
  - Raisons
  - Nature
  - Impact
  - Réactions

# Aspartame is not absorbed as such!



# Components of Aspartame



# ASPARTAME (E951)

La DJA de l'aspartame a été fixée à 0-40 mg/kg de poids corporel par le JECFA et le CSAH. Aux USA la DJA a été fixée à 0-50 mg/kg/bw par la FDA.

Note: Ceci permet de couvrir 5 fois la consommation journalière moyenne de sucre pour une personne de 60 kg

# Conclusions

(Quote from I.Munroe and A.Renwick)

- **It is difficult to identify any dietary constituent that has been more thoroughly evaluated than aspartame.**
- **The breadth and depth of scientific data available on aspartame and reviewed so far is unlikely to exist for any other food additive.**
- **The continuous debate on such “non-issues” only serves the purpose to divert attention and allocation of resources from more important health issues in need to be addressed**

# Conclusions (cont)

## Aspartame's main qualities are :

- Sweetness: clean and sweet like sugar without bitter or metallic aftertaste
- Flavor enhancing: mainly in acid fruit flavors or in naturally derived ones.
- Sweetness intensity between 160 and 220 times sweeter than sucrose

# Conclusions (cont.)

- Palatability enhancement
- No calories
- Important safety margin
- No insulin release for diabetics
- Less impact on environment per unit sweetness produced than sugar

# SCF December 2002

- “Aspartame is unique among the intense sweeteners in that the intake of its component parts can be compared with intakes of the same substances from natural foods”. The Committee concluded that on the basis of its review of all the data in animals and humans available to date, there is no evidence to suggest that there is a need to revise the outcome of the earlier risk assessment or the ADI previously established for aspartame.”

# EFSA May 2006

- ...“there is no need to further review the safety of aspartame, nor to revise the previously established Acceptable Daily Intake (ADI) for aspartame.”

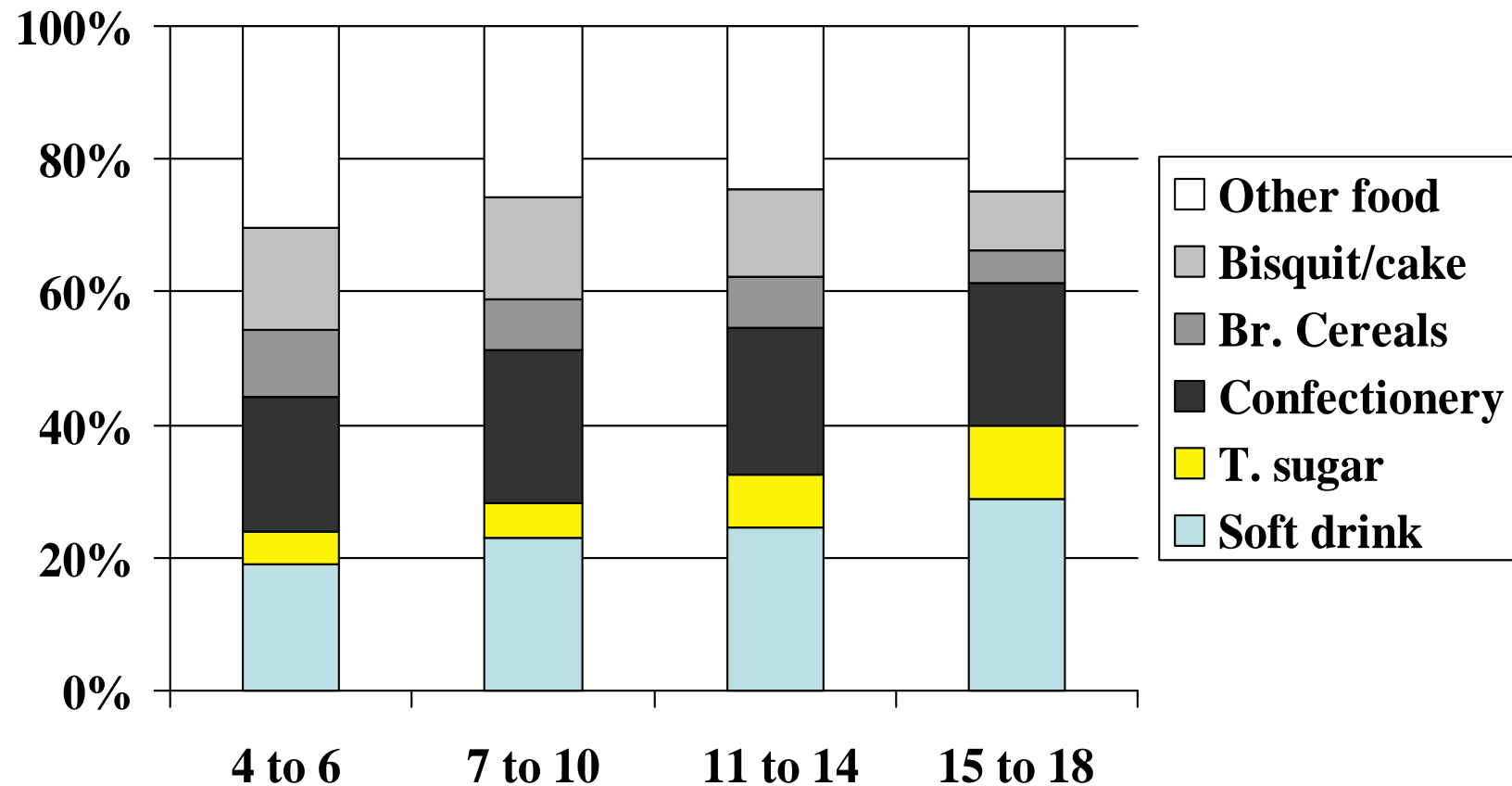
# UTILITE



# 2004 WHO Recommendation

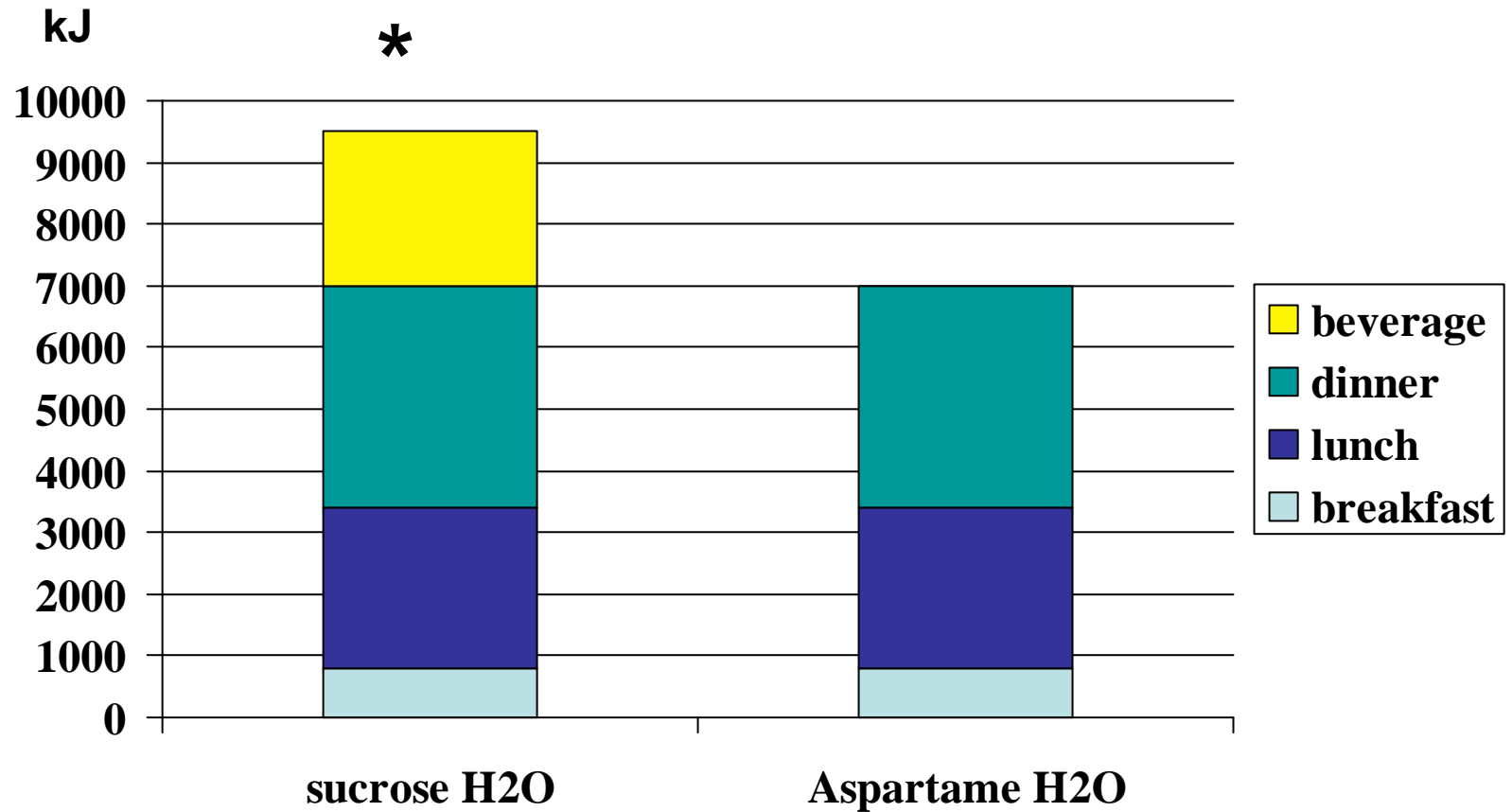
Reduce free sugar consumption  
under 10 % of calorie intake!

# % contribution of food groups to average daily intake of simple sugars for boys & girls



Nutr. Bullt. 25/2, 2 June 2000, G. Smithers et al.

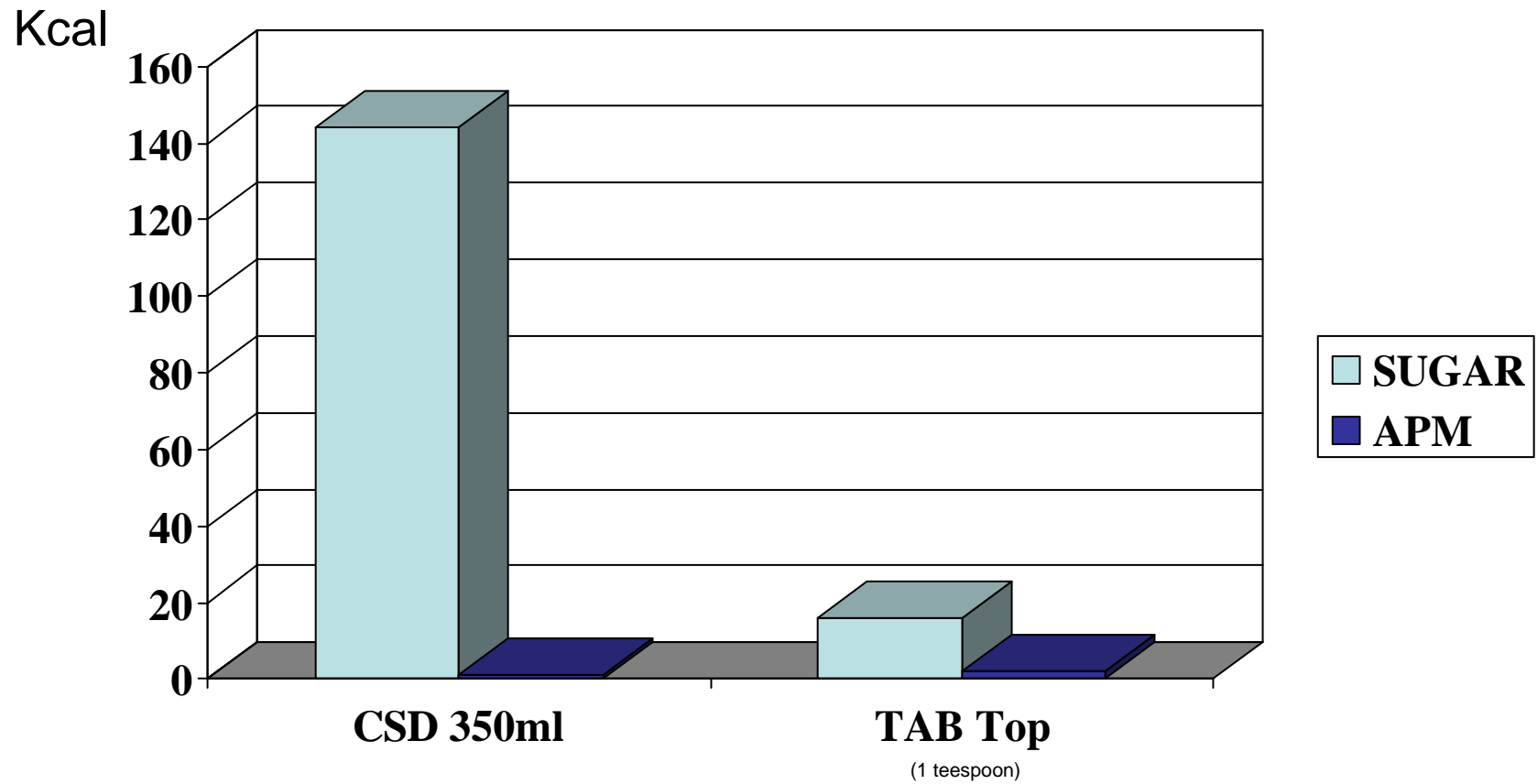
# total energy intake 1.day after beverage consumption



\*  $p < 0.01$

Appetite, 31,:67-81,1998, M.E. Beridot-Thérond et al.

# calorie reduction with intense sweeteners



# Minor weight change and risk reduction

## ISA PARIS

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Tommy LS Visscher, Jaap C Seidell



vrije Universiteit amsterdam

**N R 9**

Netherlands Researchprogramme  
weight Gain prevention

Nederlandse  Hartstichting

# Conclusions

- Yes, minor weight change has large risk reduction  
i.e. 4.3 kg/b.w loss reduces the risk of diabetes Type 2 by 70%.
- Interventions aiming at small changes on large scale should be encouraged
- Weight control is future challenge



# Aspartame and weight control

## A systematic review and meta-analysis of studies

**Dr Margaret Ashwell OBE**

[margaret@ashwell.uk.com](mailto:margaret@ashwell.uk.com)

[\*\*www.ashwell.uk.com\*\*](http://www.ashwell.uk.com)

Robust result!

Weight loss= 0.2kg adipose  
tissue/week

Close agreement between two meta-  
analyses

Different study designs

Different controls

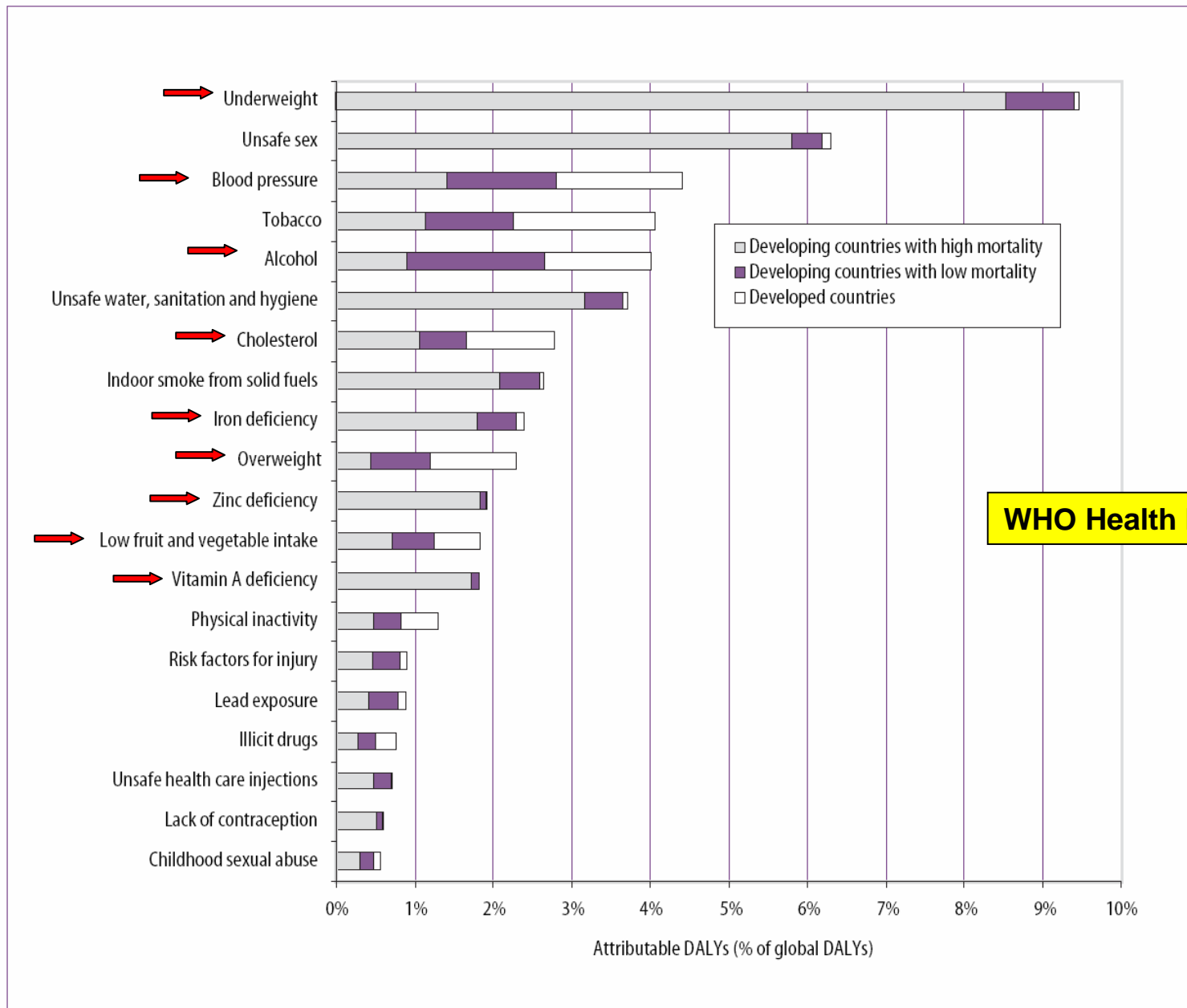
BUT Same result!

# Conclusion

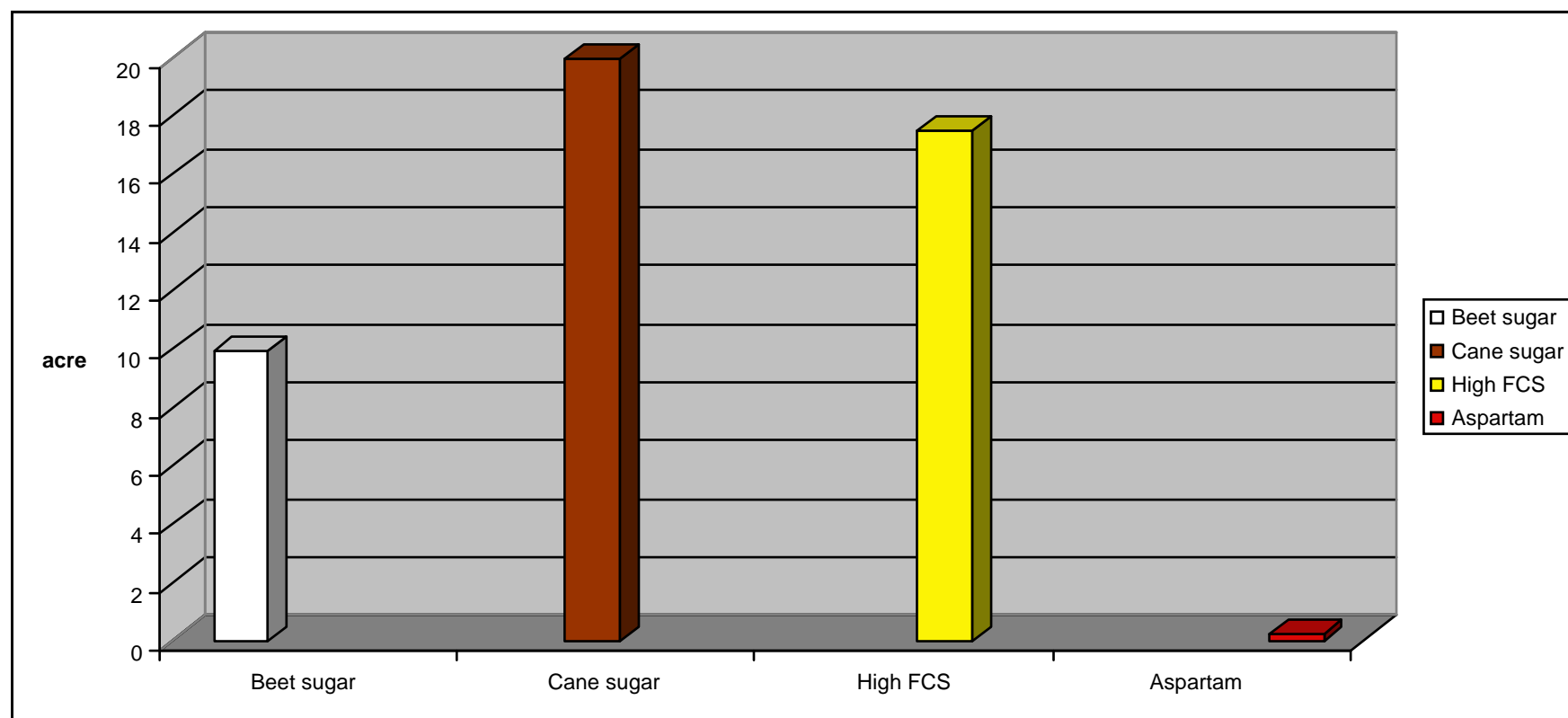
Using foods and drinks sweetened with aspartame instead of those sweetened with sugar is an effective way to maintain and lose weight without reducing the palatability of the diet.

# Environnement

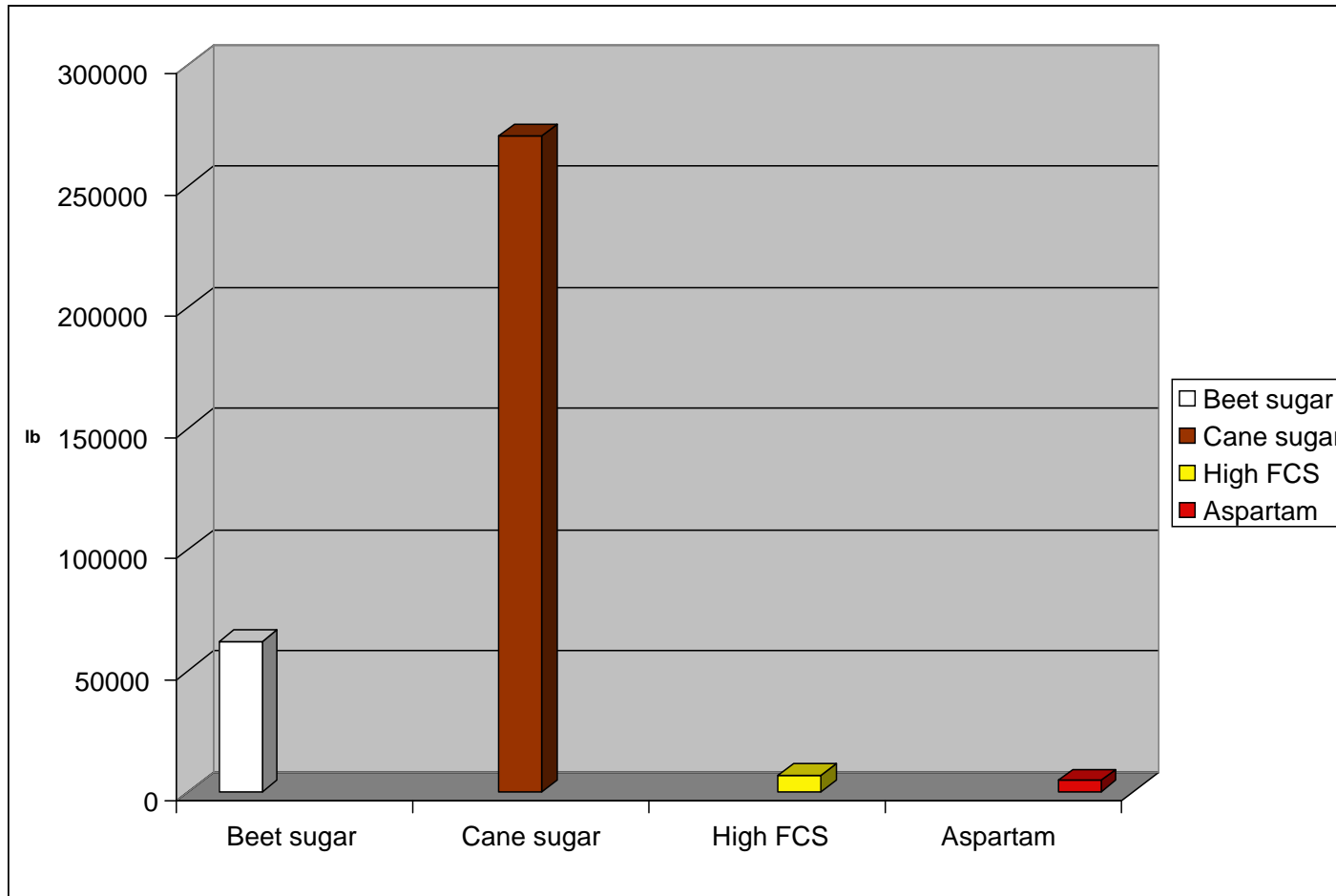
Figure 4.9 Global distribution of burden of disease attributable to 20 leading selected risk factors



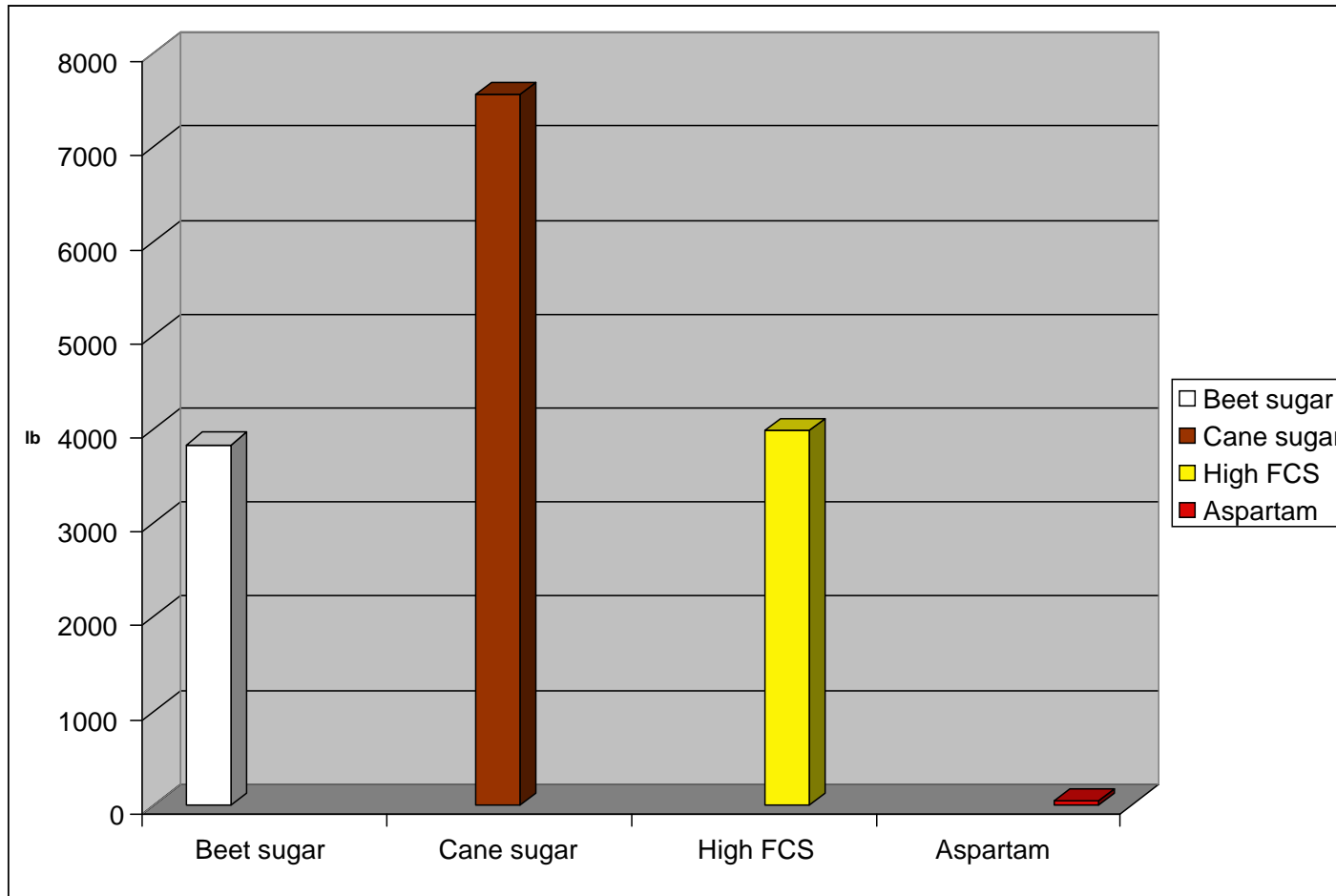
# Agricultural Land Use for Sweetener Production



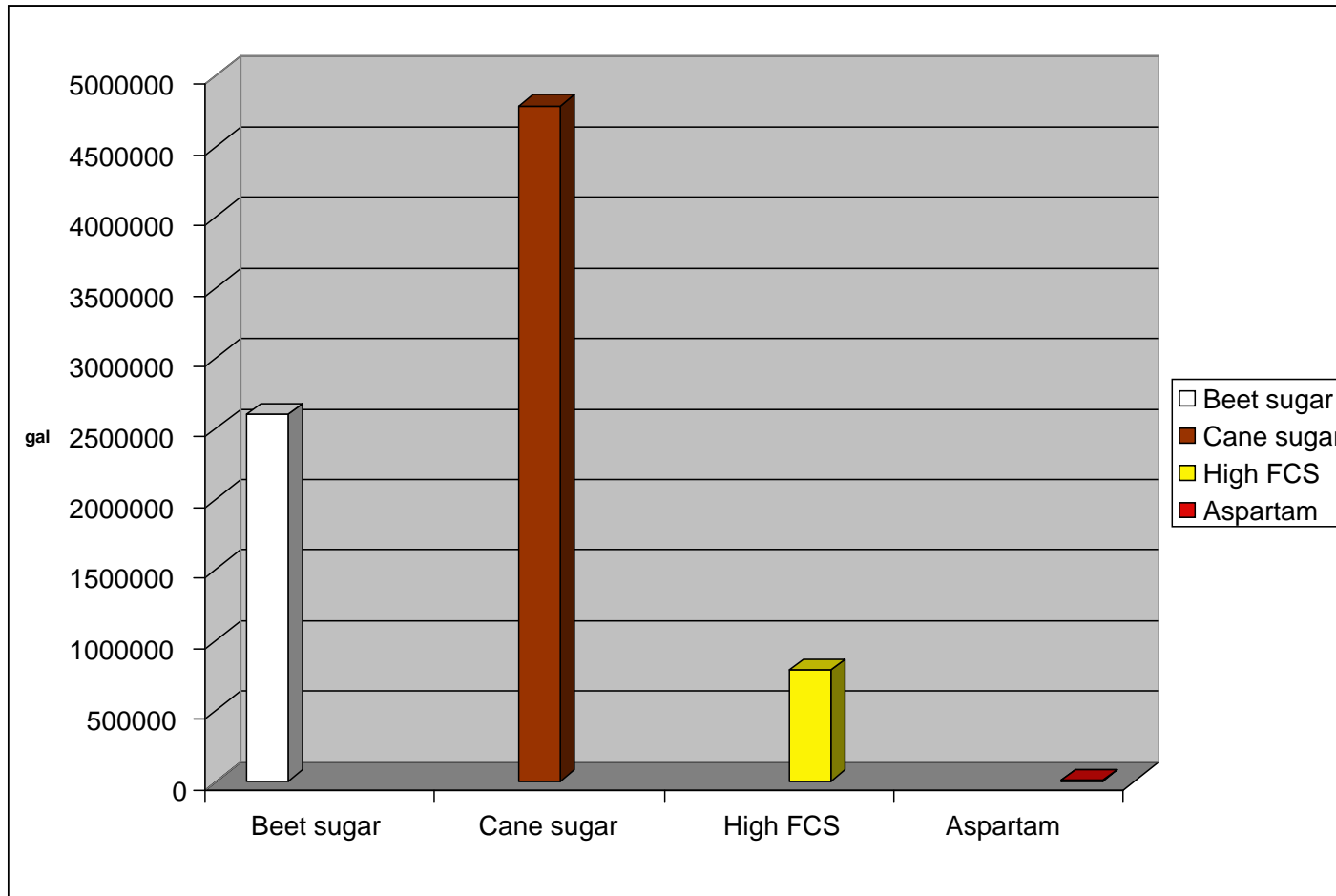
# Geologic & Biotic Ressources (per 100 000 lb sucrose equival.)



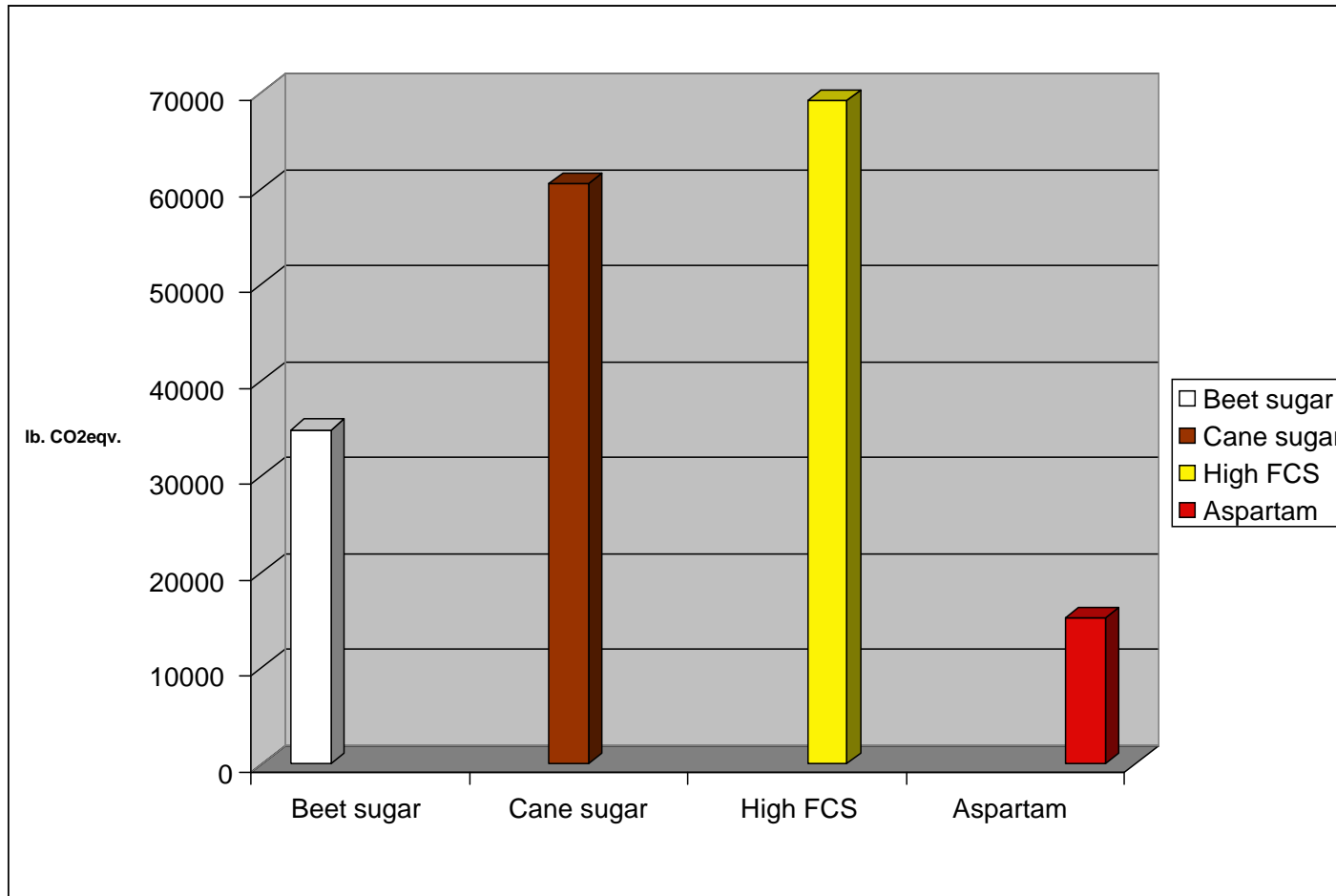
# Total Agrochemical Use in Sweetener Production (lb)



# Agricultural Water Consumptive Use (gal)



# Global Warming Potential Emissions (lb. CO2 equiv.)

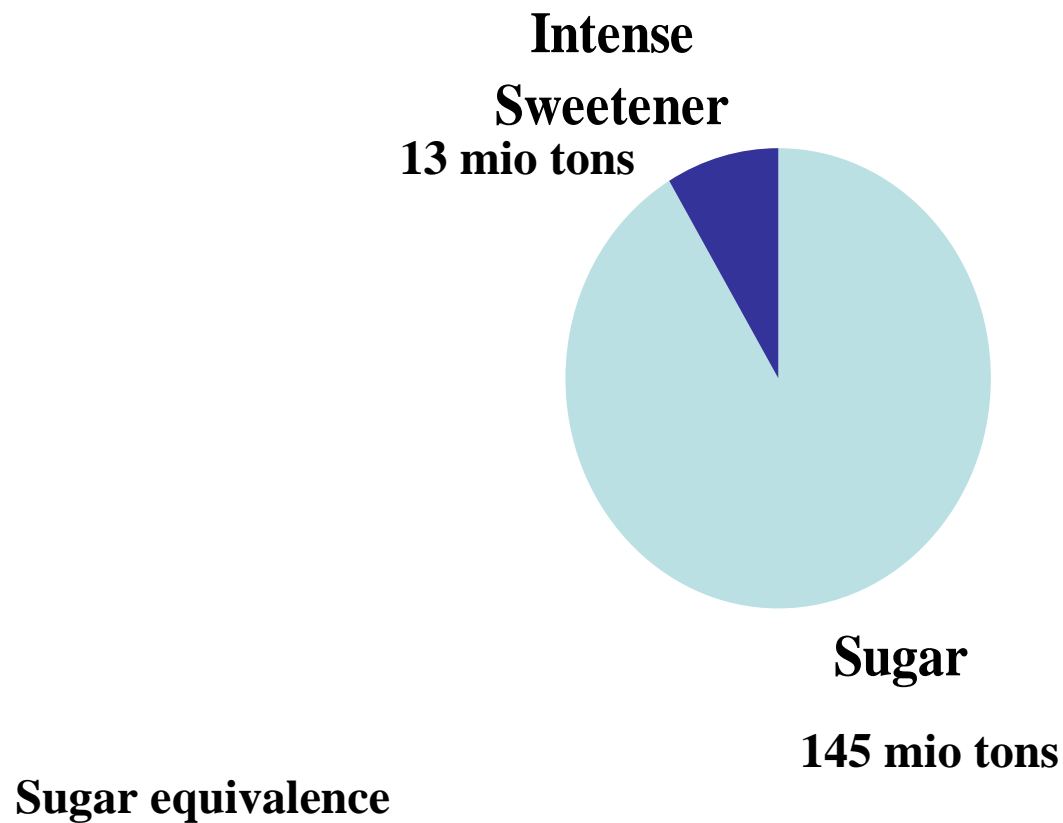


# PRODUCTION

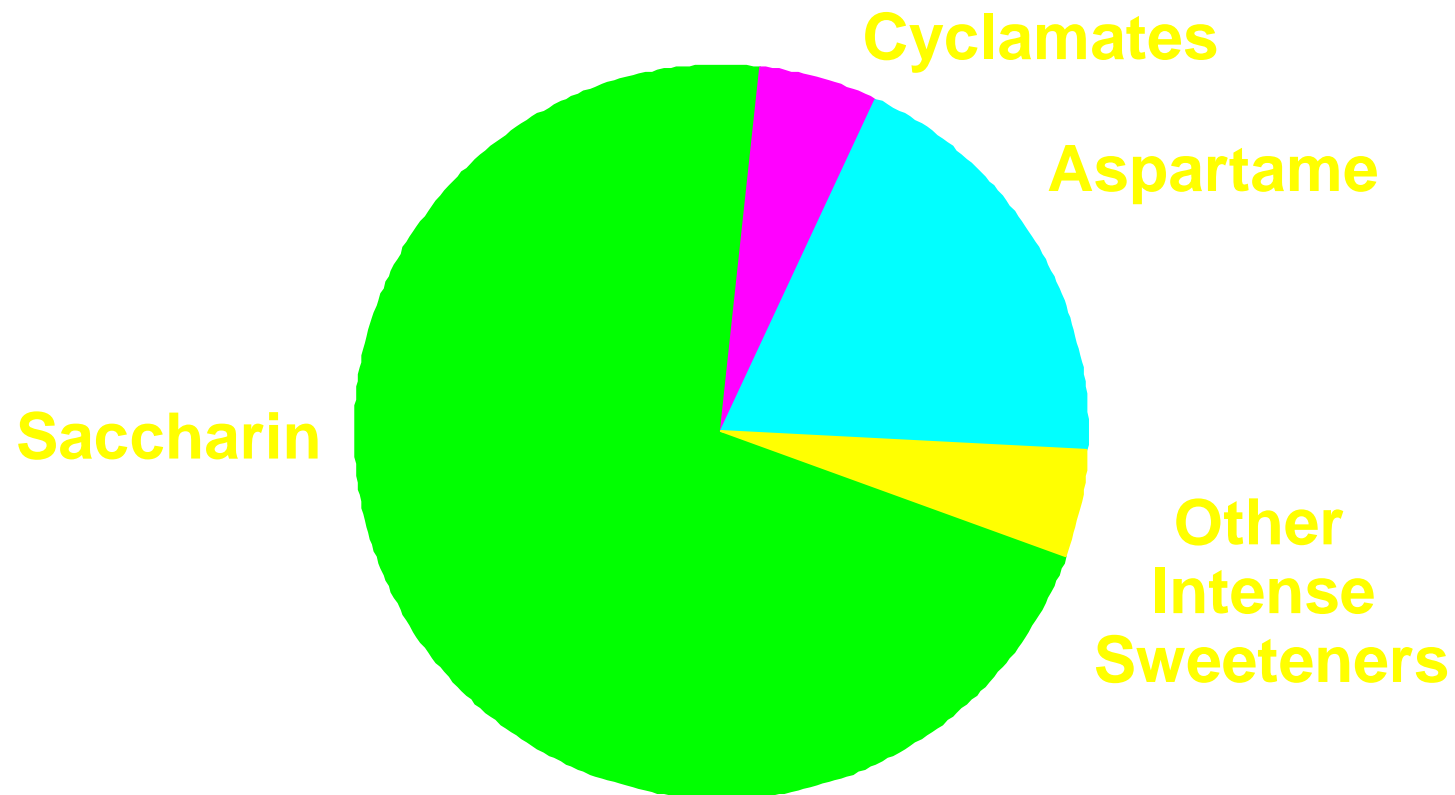
# Sweet Taste

- Man is craving for sweets since over 5 Mio. years (psychology linked to mother milk)
- Among the four **basic** tastes, sweet is the only one perceived as pleasant by children
- Broad sugar availability only two hundred years old.
- Intense sweeteners available since the end of the 19th century (saccharin)

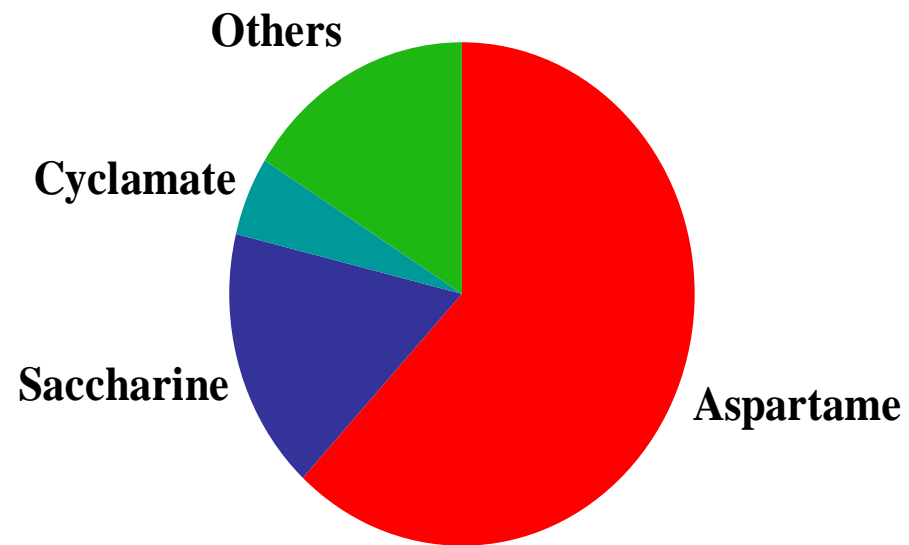
# World sweetness consumption



# Share of World Consumption by Intense Sweetener



# Intense Sweetener by value



# Attaques

# Raisons

- Contrairement à la saccharine et au cyclamate, l'aspartame a une bonne et belle histoire:
  - Constitué d'éléments naturels
  - Goût très proche du sucre
  - Succès dans les boissons
  - Preuves d'efficacité clinique
- Concurrence avec le sucre
- Concurrence avec d'autres édulcorants faibles en calories

# Nature

- Responsable de tous les maux dont l'étiologie est inconnue:
  - Epilepsie
  - Sclérose multiple
  - Perte de la vue
  - Hyperactivité
- Responsable de pathologies graves:
  - Cancer:
    - tumeurs du cerveau
    - Agent cancérigène multiple à faible doses

# Impact

# UK Press



Romeike Media Intelligence, Romeike House, 290-296 Green Lanes, London, N13 5TP

Daily Express (Page # 34) / 19.07.2005 / Main Pages / 983391 /

your**health**

## Beware of sweet talk

Rats fed on a sweetener are more likely to get cancer, scientists warned last week. MALCOLM KANE says there is more to the scare than meets the eye

**Y**OU ARE very likely to have consumed aspartame and may well have some in your kitchen. It is used in more than 6,000 foods, drinks and medicines – including soft drinks, sweets, desserts and yogurts. Aspartame is the chemical name for the sweetener in NutraSweet, which you may also use in tea and coffee.

Last week, a respected Italian research laboratory reported the first evidence of cancer in female rats fed with aspartame. So should we immediately stop eating anything containing the sweetener?

I suggest the immediate answer is no. Firstly, this is a highly specialised scientific study, with results that can be interpreted only by using advanced statistics, and most of us should be cautious about statistics.

We need an expert response with more thorough investigations, repeat trials, and the other side of the argument considered. This is the job of the Government's Food Standards Agency and we should wait for its response – though not for too long. Saccharin was one of the earliest

artificial sweeteners and is generally regarded as having a bitter aftertaste. Newer artificial sweeteners such as aspartame, cyclamate, acesulfame K and sucralose taste similar to sugar.

This points to another reason for not overreacting. Companies in the sugar industry have often funded research into artificial sweeteners because it would be good news for them if they were proved to be dangerous. The researchers who did the latest aspartame study deny they received any sugar industry funding. But such

funding has helped to create previous health scares about artificial sweeteners. It's a tangled, mudslinging world of research grants, sponsorship and countless single-issue action groups hosting hostile websites on the internet.

Food companies need to agree a more sensible way of evaluating scientific experiments, to save the consumer from being needlessly spooked. There are enough genuine food scares needing the fresh air of publicity, such as Sudan 1, the toxic red dye found in hundreds of products.

Sugar sales have fallen steadily for some years. But the sweetener market, created by health concerns about tooth decay and obesity, is growing by 8 to 10 per cent a year.

Sugar has played a major role in rotting our teeth and making us fat, producing a very profitable, growing market in foods sold as diet, low calorie and sugar-free, which taste the same as the high-sugar originals.

Artificially sweetened products undoubtedly do have an important role in reducing obesity and tooth decay but they do have one disadvantage. Sugar can be addictive, and while artificial sweeteners can help us to fight the fob, they don't reduce our addiction to sweet-tasting foods. Well they wouldn't, would they? Their market would disappear. Best to wean ourselves off all sweetened foods.

Then we avoid the weight problems and tooth decay caused by sugar and any possible health risks that may be linked to artificial sweeteners.

● Malcolm Kane is former chief food scientist at Sainsbury's.



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Page 1

# UK Press



The Guardian (Page 7) / 18.07.2006 / G2 / 405689

## Sutherland



Aspartame – the sweetest poison known to humanity? More likely it's a stem in a Do. Cokya can

Aspartame is a sweetener that is used in many soft drinks and other products. It is a chemical compound that is made from two amino acids, aspartic acid and phenylalanine. It is a very sweet substance, about 200 times sweeter than sugar. It is used in many products, including soft drinks, chewing gum, and other products. It is a very safe substance, and it is used in many products. It is a very safe substance, and it is used in many products.

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Fig. 1.2.1

# India

1. Times of India (July 16th 2005)

## **Researchers link diet food sweetener to cancer**

By Sean Poulter

The artificial sweetener aspartame, which is used in 6,000 diet food and pharmaceutical products, has been linked to cancer. The additive — also known as NutraSweet — is found in Diet Coke, Candarel, Pepsi Max, Ribena Light, Muller Light strawberry yoghurt, Wrigley's Extra Spearmint chewing gum and many other products. Fears about its safety have been raised by the Italian-based European Foundation of Oncology and Environmental Sciences,

which found a link to cancer and leukaemia in studies with rats. Its research, published on Thursday, has prompted the European Food Safety Authority to order an expert review of the data 'as a matter of high priority'. But the study has

been rubbished by two of the producers of aspartame, NutraSweet of America and Ajinomoto in Japan. They say it has been consumed by hundreds of millions of people around the world for over 20 years and there is no proof to suggest it causes cancer. He said the doses

of aspartame tested were out of proportion to human consumption levels. NYT News Service

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The Hindustan Times (July 16, 2005)

## **2. BODY TALK - Aspartame under cancer scanner** *Guardian News Service*

THE EUROPEAN Food Safety Authority is reviewing "as a matter of high priority" the results of a large new study into aspartame, the artificial sweetener consumed by millions of people worldwide and used in more than 6,000 food and drink products. Researchers at the Ramazzini Institute for cancer research in Italy say their study shows that aspartame causes lymphomas and leukaemia in female laboratory animals "at doses very close to the acceptable daily intake for humans". The authors of the study also say that while rats fed aspartame ate less food, there was no difference in body weight between treated and untreated animals. One of the largest manufacturers of aspartame, the Japanese multinational Ajinomoto said the allegations made by the Italian study were "not consistent with the extensive body of scientific research which already exists on aspartame". It questioned the methods used and the record of the institute. It pointed to four previous studies into the carcinogenicity of aspartame that had found no relationship between aspartame and any form of cancer. It added that aspartame broke down in the body into the building blocks of protein that occur widely in the rest of food. It also helped people reduce their calorie intake. This cut obesity and helped to prevent cancer, a spokesman said. The Ramazzini Institute has sent its first results to the European Food Safety Authority. EFSA confirmed that it would be asking its expert scientific panel on food additives to review the results "as a matter of high priority". Until that review had taken place it did not have a basis for recommending that consumers change their diet in respect of aspartame, it added.

# L'aspartame cancerogeno sui topi


*Corriere della Sera*  
15/07/2005

Aspartame cancerogenous in  
rats

Corriere della Sera 15.07.05

# Aspartame killer

## *Il Manifesto* 15/07/2000

- **Ricerca sull'aspartame lancia l'allarme:  cancerogen! *Il Tempo* 15/07/2005**
- Research on aspartame ringing alarm: cancerogenous! *Il tempo* 15/07/05
- **L'Aspartame sarebbe cancerogeno**  
*Messaggero Veneto* 15/07/2005
- Aspartame could be cancerogenous
- *Messaggero Veneto* 15/07/05

**Studio italiano scatena la  
polemica: L'aspartame   
cancerogeno**

***Libero*15/07/2005**

Italian Study unleashes  
polemic: Aspartame  
cancerogenous  
Libero 15/07/05

# L'aspartame non è cancerogeno

## *Il Giornale* 15/07/2005

- Aspartame is not cancerogenous

*Il Giornale* 15/07/05

**Ricerca: L'aspartame  cancerogeno**  
**L'Efsa: Per ora nessuna variazione nelle diete** *La Gazzetta di Parma* 15/07/2005

Research: Aspartame cancerogenous-  
EFSA: For the time being no change in  
the diet. *La Gazzetta di Parma* 15/07/05

**Dolcificanti, aspartame nel  
mirino un rapporto accusa:**

**❖ cancerogeno**

***La Repubblica* 15/07/2005**

**Sweeteners, aspartame in  
the viewfinder a report**

**charges: cancerogenous**

**La Repubblica 15/07/05**

**Allarme in tavola**

**L'aspartame** 

**cancerogeno** *Il Resto del*

*Carlino* 15/07/2005

Alarm on the table  
aspartame is

cancerogenous

Il Resto del Carlino

15/07/05

**Allarme da una ricerca  
italiana "L'aspartame   
cancerogeno"**

**La Repubblica 14/07/2005**

Alarm from an Italian  
research "aspartame is  
cancerogenous"

La Repubblica 14/07/05

**Sweetener 'linked' to  
leukaemias *BBConline***

14/07/2005 15:26

**L'ASPARTAME SAREBBE  
CANCEROGENO, EVIDENZE DA  
TEST SU RATTI *ANSA*14/07/2005  
19:20**

Aspartame could be  
cancerogenous, evidences from  
a rat test *ANSA* 14/07/05 19:20

Ricerca lancia l'allarme,  
Federchimica nega  
“L'aspartame è cancerogeno”  
La Stampa 15/07/05  
Research launches alarm,  
Federchimica negates  
“Aspartame is  
cancerogenous”  
La Stampa 15/07/05

ANSA

SANITA': STORACE, A CONSIGLIO  
SUPERIORE DATI SU ASPARTAME  
NOTIZIE SCIENTIFICHE SU DOLCIFICANTE  
NON SONO DA SOTTOVALUTARE  
2005-07-15 14:32

ADNKRONOS SALUTE

15/07/2005 13.42

ALIMENTI: COLDIRETTI, NELL'INCERTEZZA  
MEGLIO ZUCCHERO CHE ASPARTAME

# **Fresh tears raised about aspartame**

Manufacturers dispute study into lab rats fed sweetener

**Felicity Lawrence, consumer affairs correspondent**

**Friday July 15, 2005**

**[The Guardian](http://www.guardian.co.uk) <<http://www.guardian.co.uk>>**

## **Sweetener's 'link to cancer' denied**

By SEAN POULTER, Daily Mail

08:30am 15th July 2005

## **Italian Study Links Artificial Sweetener, Aspartame, To Leukemia in Rats**

**Date Published: July 15, 2005**

**Source: Newsinferno.com News Staff**

**Breaking News: New Study on Aspartame  
shows Lymphoma and Leukemia**

Added: (Thu Jul 14 2005)

From: "Dr. Betty Martini,D.Hum."

Subject: Aspartame Induces Lymphomas and  
Leukemias in Rats (Eur. J.  
Oncol) (Response to BBC)

15/07/2005 17.12

## ALIMENTI: CURSI, VERIFICARE RISCHI PRIMA DI RITIRO DA COMMERCIO

Roma, 15 lug. (Adnkronos Salute) Sul'caso aspartame'  
"si deve ragionare  
in termini rigorosamente scientifici e non sulla base  
dell'emotività, che  
rischia di sfociare nella superficialità". Lo afferma il  
sottosegretario alla Salute, Cesare Corsi, in risposta  
a Luana Zanella, deputata dei Verdi in Commissione  
Affari Sociali, che ha chiesto il ritiro dell'aspartame  
dal commercio.

1. Times of India (July 16th 2005)

**Researchers link diet food sweetener to  
cancer**

By Sean Poulter

Copyright 2005 Nationwide News Pty Limited  
Sunday Times (Perth)(Perth, Australia) July 17, 2005  
Sunday

**Aspartame linked to cancer in  
rats**

The Guardian 18/07/05

**Aspartame-the sweetest  
poison known to humanity?  
More likely, it's a storm in a  
Diet-Coke can.**

By J.Sutherland

Le Figaro "sciences & santé" titre son article :  
"*L'aspartame serait cancérigène*" selon une  
dépêche de l'AFP du 16 juillet 2005

Le Figaro "science & Health":

"Aspartame could be cancerogenous",  
according to a press release of AFP dated  
July 16 2005

1 Radio

1 TV

# The publication! (on the web 14.07.05)

Original studies/Studi originali General  
topics/Argomenti generali Eur. J. Oncol.,  
vol.10, n. 2, pp. 00-00, 2005 IN  
PRESS

Aspartame induces lymphomas and leukaemias  
in rats a L'aspartame induce linfomi e  
leucemie nei ratti

Morando Soffritti, Fiorella Belpoggi, Davide  
Degli Esposti, Luca Lambertini

Cancer Research Centre, European Ramazzini  
Foundation of Oncology and Environmental  
Sciences, Bologna, Italy

# Later press cuttings

- Aspartame cancerogenous, a gift from Donald Rumsfeld /IL Manifesto 17/07/05
- [Aspartame presents a risk of cancerogenicity La Tribune 18/07/2005](#)
- [Annunziata interrogates Storace on Aspartame's cancerogenicity La Città di Salerno 17/07/05](#)
- Aspartame out of mensa and hospitals IL Trentino 17/07/05.

# Later press cuttings

- Aspartame cancerogenous? The Greens require to stop sales. La Gazzetta del Mezzogiorno 16/07/2005
- Coldiretti: scientific research supports natural sugar. IL Messaggero 16/07/05
- Storace: on aspartame we shall verify. IL Messaggero. 16/07/05
- The request by Bertolini: Aspartame banned from public structures. L'Adige. 16/07/05.

# Later Press cuttings

- Daily Express 19/07/05  
“Beware of Sweet Talk” Rats fed on a sweetener are more likely to get cancer scientists warned last week. M.Kane says there is more to the scare than meets the eye.
- La Libre Belgique 19.07.05. Aspartame, Cancerogenous agent?
- Radio RMC 2min 58” 19.07.05
- Que choisir? 19.07.05
- 20 Minutes 19.07.05
- wanadoo.fr web site 19.07.05

# Later press cuttings

- **India: Shun artificial sweeteners**
- The Hindu ; 21 July 2005  
New study finds them full of harmful chemicals
- L'Espresso, 20.07.05  
Very bitter sweetener. An Italian study fails aspartame: it is cancero- genous.

# Press release by ISA taken up by

- SNBR (France 21.07.05)
- Federchimica (14.07.05)
- AIPA (Italy 14.07.05)
- Synpa (France 21.07.05)
- ANIA (France 18.07.05)
- CIAA (Brussels 18.07.05)

# Press releases

[http://www.efsa.eu.int/press\\_room/press\\_release/1038/pr\\_aspartame\\_fr1.pdf](http://www.efsa.eu.int/press_room/press_release/1038/pr_aspartame_fr1.pdf)

<http://www.afssa.fr/ftp/afssa/CPaspartame150705.pdf>

[http://www.edulcorants.org/pdf/aspartameJuly05\\_FR.pdf](http://www.edulcorants.org/pdf/aspartameJuly05_FR.pdf)

[http://www.synpa.org/scripts/fr/04actualites/04\\_actu.asp?iType=2](http://www.synpa.org/scripts/fr/04actualites/04_actu.asp?iType=2).

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# AESA (EFSA) Mai 2006

- ...“Il n’est pas nécessaire de revoir davantage la sécurité de l’aspartame, ni de reconsidérer la Dose Journalière Acceptée (DJA) pour l’aspartame”.

# Suggestion en guise de conclusion!

- Il est urgent d'identifier une procédure qui permette aux autorités, chargées de l'analyse et de la gestion du risque, d'accéder en primeur à toute nouvelle étude ayant un lien avec la sécurité du produit autorisé.
- Ceci permettrait de mettre en perspective les risques perçus avec toutes les données de sécurité existantes.
- Ce n'est qu'après une telle évaluation, qu'une communication sur le risque correcte peut avoir lieu.