

COMMITTEE ON TOXICITY OF CHEMICALS IN FOOD, CONSUMER PRODUCTS AND THE ENVIRONMENT

COT STATEMENT ON THE EFFECTS OF CHRONIC DIETARY EXPOSURE TO METHANOL : LAY SUMMARY

Methanol (methyl alcohol) is a chemical which is similar in structure to ethanol (ethyl alcohol), the alcohol found in alcoholic drinks.

It is generated in the body as a by-product of protein formation, and is also found in food, particularly fruit and vegetables, from which it is taken up during digestion. Another dietary source is the sweetener aspartame, which breaks down in the body to amino acids and methanol. Some people are exposed to methanol vapour through their work.

In the body, some methanol is excreted unchanged in urine or breath, but most is broken down through a series of chemical reactions. The methanol is first converted into formaldehyde, then formate or formic acid and finally carbon dioxide.

High intakes of methanol, usually from consumption of illegally distilled alcoholic drinks or counterfeit drinks made from methylated spirits, can be toxic to the nervous system, particularly to sight, and if enough is consumed can result in permanent blindness or even death. The toxicity is caused by the breakdown product formate. The body's capacity to convert formate to carbon dioxide is limited, and when production of formate exceeds the maximum rate at which it can be eliminated, the formate begins to build up.

Although the toxicity of methanol at high doses is well established, less is known about whether effects occur from lower levels of exposure that continue over a long time, and it has been suggested that the methanol released from the sweetener aspartame could be harmful.

The COT was asked to review the scientific evidence on possible effects of long-term, low-level exposure to methanol, and particularly the exposures that might occur from aspartame. We considered information on how methanol is absorbed into the body, broken down and excreted. We looked at information on how much methanol is produced by the body, and how much could be taken up from food and drink, including from aspartame. We also looked at data from studies in humans who had consumed or inhaled known amounts of methanol, to see whether there was any evidence that formate levels built up or toxic effects occurred.

The evidence reviewed indicated that the body itself produces 0.3 to 0.6 g methanol/day and that up to 1 g/day may be consumed in food, particularly fruit and vegetables. The methanol released from aspartame would be a maximum of 0.24 g/day (though survey data suggest it is actually much lower than this).

Experiments have shown that exposure to aspartame, even at doses well above the maximum that could be expected from food and drink, does not lead to a build-up of formate in the blood. Furthermore, there are no reports of illness associated with long-term occupational exposure to methanol vapour at levels below the permitted maximum concentration of 200 parts per million (although adverse effects have been reported at higher levels). Over an eight-hour working day, this exposure would give a daily dose of approximately 1.9 g – well in excess of that which could occur from aspartame.

Uncertainties remain because there have been few studies of long-term repeated exposure to methanol, either in animals or in humans. However, from the evidence available, the COT concluded that amounts of methanol consumed through food, including from aspartame, would not result in build up of formate and so are unlikely to cause harmful health effects.

The full COT statement can be found at:

<http://cot.food.gov.uk/pdfs/cotstatementmethanol201102revjuly.pdf>

**Lay Summary to COT Statement 2011/02
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