

RESPONSE DATED 16 AUGUST FROM PROFESSOR MIKE LEAN, UNIVERSITY OF GLASGOW

I reviewed the safety and role of aspartame several years ago to write an invited editorial in the British Medical Journal. <http://www.bmj.com/content/329/7469/755.full> That included wading through hundred and hundreds of bizarre and ill-informed web postings, as well as examining the evaluations of proper research.

My conclusion was that aspartame is very safe, and there was no credible evidence that it had ever caused any injury or harm - even in amounts much larger than could be consumed from foods or drinks.

There were, and still are, countless web-pages given to attacking aspartame, with a vast range of claims that it is toxic. The background to this is obviously some neophobia, but I suspect that people were very sensitised to the fact that aspartame was developed by Monsanto, an American company which behaved very badly over its introduction of genetically modified seeds. That is speculation on my part to explain the level of vitriol directed at aspartame. I suspect the company probably did not actively broadcast the fact that the molecule of aspartame contains methanol in its structure, and that will have raised suspicions.

Jim McDonald has identified the fact that the small molecule of aspartame is made from two natural aminoacids, held together with a molecule of methanol. That is what it looks like on paper, but the methanol is not free, it is part of the structure of the bigger molecule. About 10% of the weight of aspartame is the methanol component. When it is digested, the molecule is ultimately broken down to end-products of water and carbon dioxide. The process would be expected to include the release, temporarily, of minute amounts of methanol, but we are talking infinitesimally small amounts, and not enough to be detected in the blood stream. There are quite large amounts of methanol in some alcoholic beverages, which we all accept, and in some fruits, which we actively encourage in human diets.

It is entirely proper that concerned members of the (Scottish) public should petition government on matters which concern them. For any issue around toxicity and food, the Food Standards Agency has an independent Advisory Committee on Toxicity (COT), and it has reported on dietary methanol in 1997 and in 2011.

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

In this report, the example is given that it is necessary to consume 500mg of methanol to detect a rise in the breath (which means it must have reached the blood stream). To achieve that you would need to eat 750 grams of apples or peaches. I could manage that over a couple of hours. The same amount of methanol could come from 5 grams of aspartame, but that would require consumption of 8 litres of a soft drink sweetened entirely with aspartame at the maximum permitted concentration ((600 mg/litre). I could not manage that. And it doesn't cause any harm at that level.

The amount of methanol needed to cause any toxic effects is 14.7 grams for a 70 kg man. That would require at least 147 grams of aspartame. At the maximum concentration of 600,mg/litre of aspartame in soft drinks,, that would require consumption of about 200 litres of a soft drink.

I do not think this petition should waste more government time. Mr McDonald should be referred to the FSA Its lay statement is very clear <http://cot.food.gov.uk/pdfs/cotstatementmethanol201102lay.pdf> The COT is entirely independent and trustworthy (I chaired a parallel committee, the FSA Advisory Committee on Research, for 6 years).

I might just add my concern about the mouse experiments conducted in Italy, referred to in the FSA statement, which are reported as showing that aspartame caused some cancers. Those experiments fed aspartame in huge dosage, or placebo, to large numbers of mice for their entire lives. When they died (as all mice must) they were very carefully dissected to try to detect any sign of cancer in all the organs (irrespective of why the mouse died). They reported that there were significantly more cancers in certain organs of the mice which had been fed aspartame. But there was no difference in life expectancy, so what they were detecting did not affect survival. And they did not report that some cancers were significantly less in the aspartame -fed mice. This whole experiment was in fact a lesson in how to confuse lay people, and a lot of good scientists, by statistics. If you follow up two very large groups of identical animals for life, it is likely that on average both groups will survive for the same length of time (as happened to these mice) But it is also likely that the exact numbers of animals with different specific cancers will be a bit different between the two groups (that is what happened to these mice). If you look for dozens of different cancers, by pure chance there will be 'significantly' different numbers of specific cancers in the two groups (that is what happened to these mice). The word 'significantly' is a statistical one: A "significant" increase in 1 in 20 cancers will occur purely by chance, with nothing to do with the diet or the aspartame.

I do hope this helps.

Professor Mike Lean