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2,2-BIS(4-HYDROXYPHENYL)PROPANE (Bisphenol A)

The Scientific Panel on Food Additives, Flavourings, Processing Aids and Materials in Contact with Food has reconsidered its view of the toxicity of bisphenol A (BPA). New research points to the prescription of a lower degree of protection. BPA has been associated with endocrine disruption.

BPA is used in the production of polycarbonate a plastic widely used for containing food. BPA migrates from this plastic into food. There are concerns that it could act as an endocrine disruptor, the effects of which would be of most concern in infants; effects could persist for life.

Surveys of typical diets have produced estimates of the dietary intake of BPA as a function of age. The surveys did not include contributions from mains drinking water supplies or the effects of heating the food containers e.g. in a microwave oven, which may liberate more BPA into container contents.

Table 1. Conservative estimates of total dietary exposure to bisphenol A at different ages

Age of consumer	Food/Beverages consumed	Dietary exposure to BPA based on conservative migration value in microgram/kg bw/day (Figures in parenthesis represent exposure based on typical migration value)
3 month infant	Breast milk only	0.2
3 month infant	Infant formula fed with glass or non-PC bottle	2.3
3 month infant	Infant formula fed with PC bottle	11* (4#)
6 month infant	Infant formula fed with PC bottle and commercial foods/beverages	13* (8.3#)
1.5 year-old child	2 kg commercial foods/beverages	5.3
Adult	3 kg commercial foods/beverages	1.5

* Based on the upper value of 50 microgrammes BPA/litre of infant formula
\# Based on the typical value of 10 microgrammes BPA/litre of infant formula

Effects of exposure to BPA (changes to the liver) have been observed in rats and mice. It is not known whether or not these effects are harmful or would be reproduced in humans.

Applying the standard safety margins, the tolerable daily intake (TDI) rate for humans has now been set at 50 microgrammes per kg body weight; the previous TDI was set at 10 microgrammes per kg body weight. This is 100 times lower than the no observable adverse effect level in rat experiments.

Clearly some dietary intakes are just below ⅓ of the TDI.

Comment
Without this revision the TDI would have been 10 microgrammes per kg body weight and would have been exceeded in two groups of infants. Exceeding the TDI by this small margin should have a very low probability of causing harm.

The 100 times safety factor applied here is based on a factor of 10 to account for interspecies differences and 10 to account for inter-individual differences.

Evidence of reproductive and developmental toxicity is still largely lacking.

The half life of BPA in humans is estimated at around 6 hours. It is removed much more slowly in rats; indicating that perhaps the adopted safety factor is still very conservative.