

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

### **COT statement on Occurrence of Mixed Halogenated Dioxins and Biphenyls in UK Food**

Dioxins, dibenzofurans and biphenyls (collectively referred to in this summary as dioxins) are chemical compounds formed as unwanted by-products in certain industrial processes and fires. They are persistent in the environment, and are known to cause a wide range of toxic effects in animals. Effects in humans have only been found at higher levels. Levels of dioxins in food and the environment have declined substantially since the 1980s.

The COT has previously set a Tolerable Daily Intake (TDI) for chlorinated dioxins (dioxins which contain chlorine but not bromine). The TDI is a level below which harmful effects are not expected to occur. The FSA monitors the presence of these compounds in food.

All dioxin-like compounds produce similar toxic effects, but some are more potent than others. The toxicity of each dioxin compound is expressed relative to that of a "reference" compound, to give a toxic equivalency factor (TEF). The total dioxin activity in a food sample, expressed as toxic equivalent (TEQ), is determined by adding the results obtained by multiplying the concentration of each compound by its TEF.

The FSA recently funded research to develop methods to measure the levels of mixed halogenated dioxins (dioxins containing both chlorine and bromine) in food. Previous research had focussed on dioxins containing either chlorine alone or bromine alone (chlorinated or brominated dioxins).

Although there are no agreed TEFs for mixed halogenated dioxins, COT considered that by applying the TEFs for the equivalent chlorinated compounds, it would be possible to estimate their contribution to total dioxin activity. If anything, this would be expected to over-estimate that contribution, since the available evidence suggests that mixed halogenated compounds are less toxic than the equivalent chlorinated compounds.

The mixed halogenated compounds measured were selected on the basis of their expected levels in the environment and their toxicity in experimental animals or

model systems, and with regard to practical considerations concerning their production. Measurements were made in similar foods to those tested in previous studies that have looked at levels of chlorinated and brominated dioxins.

Although only a small number of all the possible mixed halogenated dioxins were surveyed, those whose chemical structures were expected to result in the greatest toxicity were over-represented. The contribution of mixed halogenated dioxins to total dioxin activity in the foods tested was determined.

The major contribution to the total dioxin toxic activity in the foods measured came from chlorinated compounds. Brominated compounds made a much smaller contribution, and mixed halogenated compounds contributed even less.

Taking account of these relative contributions and dietary exposures to chlorinated dioxins, the COT concluded that the measured levels of mixed halogenated dioxins in food did not indicate a health concern.

**Lay Summary to COT Statement 2010/02  
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