

Contaminants in infant milks

Process contaminants from oil refining in infant milks

There has been recent concern that formula fed infants may be exposed to harmful levels of Glycidyl fatty acid esters (GE) and 2- and 3-monochloropropanediol (2-MCPD and 3-MCPD) and their fatty acid esters. These substances are formed when palm oils and fats and other vegetable oils are heated to temperatures in excess of 200°C during the refinement process. These potentially harmful substances have subsequently been identified in a range of oils and fats and foods that are made from them, including infant and follow-on formula milks. A recent study conducted by the Dutch National Institute for Public Health and the Environment found that samples of powdered infant formula contained significant amounts of 3-MCPD, although the levels varied widely between different products (RIVM, 2016). The European Food Safety Authority (EFSA) panel on Contaminants in the Food Chain (CONTAM) recently delivered a scientific opinion on the risks to human health posed by the presence of these contaminants in food. Based on evidence from animal studies the CONTAM panel concluded that GE is potentially genotoxic and carcinogenic and that 3-MCPD can cause kidney damage. There was insufficient data available to come to any conclusions on the toxicity of 2-MCPD (EFSA, 2016).

3-MCPD was first identified in the late 1970's and since then, its presence in specific foods where high levels have been reported has been monitored. In 2001 the Scientific Committee on Food set a safe tolerable daily intake (TDI) for 3-MCPD of 2.0 µg/kg/bw per day (SCF, 2001). Based on the available evidence the CONTAM panel have lowered the (TDI) to 0.8 µg/kg/bw per day (EFSA, 2016). In the dietary surveys included in their study, EFSA found that younger age groups were at greatest risk of exposure to 3-MCPD. In over half of the dietary surveys reviewed, the average exposure for infants, toddlers and other children up to ten years of age was at or above TDI. For infants who were exclusively formula fed, average exposure was more than three-times TDI at 2.4 µg/kg/bw per day and for those with greatest exposure more than four times TDI at 3.2µg/kg/bw per day. The CONTAM panel concluded that this level of exposure was cause for concern. It is worth noting that the TDI is set with a generous safety margin far in excess of the levels identified as causing harmful effects in animal studies.

Due to the potentially genotoxic and carcinogenic nature of GE, TDI are not set and the risk to consumers is expressed as a Margin of Exposure (MoE). The higher the MoE, the lower the level of concern and vice versa. An MoE of lower than 25,000 was considered by EFSA, to be a health concern. EFSA estimated MoE for infants aged 0-3 years with average exposure to GE range from 11,300 to 25,500. Infants who were exclusively fed on infant formula were at significantly greater risk. The MoE for average exposure was around 5,400 and for high exposure 2,100. EFSA have said that in infants MoE estimates were particularly low due to the contribution of glycidyl esters from infant formula and also point out that there were uncertainties involved in the setting of the level of MoE at 25000.

The CONTAM Panel have recommended that all potentially contaminated foods are included in future monitoring of 3-MCPD, 2-MCPD and glycidol. EFSA's scientific opinion is being used to inform EU food safety regulators considerations on how to manage the risk of exposure to these substances in foods. Recently, in 2017, EFSA issued draft regulations setting maximum levels for the presence of glycidyl fatty esters in vegetable oils and fats

placed on the market for the final consumer or for use as an ingredient in food. Because of the health concern for infants, toddlers and young children stricter maximum levels have been set for vegetable oils and fats destined for the production of baby food and processed cereal-based food for infants and young children. Taking into account the possible exposure to glycidyl esters of infants solely fed on infant formula, a specific strict maximum level for infant formula, follow-on formula and food for special medical purposes intended for infants and young children has been established. The draft regulation proposes that until 30/06/19 the maximum level of GE permitted in infant and follow-on formula milk powder and foods for special medical purposes intended for infants and young children would be reduced to <75ug/kg and after that to <50ug/kg. Lower levels of <10ug/kg and <6ug/kg are proposed for liquid formulations (EFSA, 2017). The draft regulations are available here:

https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-4129615_en

The removal of palm oil from infant milks and baby foods would be a prudent response. Kendamil and Castlemil brand milks have removed palm oil from their milks manufactured in the UK. There are other brands of infant milk in the UK that do not use palm oil in their products but the main brands, Aptamil, Cow & Gate, Hipp Organic and SMA still use palm oil in some or all of their products.

References

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