

Advice 04-2019 of the Scientific Committee established at the FASFC in regard to the toxicological concerns of possible alternatives for bisphenol A in materials that are destined to come into contact with foodstuffs

Background & Terms of reference

In Belgium, the trade, the placing on the market and the manufacture of packaging containing bisphenol A (BPA) is prohibited for foods for children from 0 to 3 years since 1 January 2013.

In Europe, the use of BPA for the manufacture of feeding bottles intended for infants made of polycarbonate was prohibited in 2011. This ban was extended in 2018 to the manufacture of drinking cups or bottles made of polycarbonate that, due to their leak-free properties, are intended for infants and toddlers. The specific migration limit (SML) for BPA in plastic materials and articles was lowered from 0,6 to 0,05 mg/kg of food. In addition, the migration of BPA into or to food from varnishes or coatings (applied to materials or articles) must not exceed the SML of 0,05 mg/kg of food. If the materials and articles are intended to come into contact with food for infants and toddlers, no migration of BPA should occur from the applied varnishes and coatings.

In order to comply with legislation, manufacturers of food contact materials (FCM) have, on the one hand, developed alternatives for the replacement of BPA in this type of FCM (polycarbonate and epoxy resins based on the BPA monomer) and, on the other hand, have searched for alternative materials to replace FCM with BPA. These alternatives are numerous, not all known to the government to date and of different nature.

The information report of the session of the Belgian Senate includes a draft of law introducing a ban on the trade in, the placing on the market and the production of recipients intended for food containing BPA or bisphenol S (BPS). The cabinet of the minister who is responsible for food safety wishes to participate in the debates on this draft law. Therefore, the minister asks the Scientific Committee (SciCom) to provide a state of affairs on the toxicological concerns of possible alternatives to BPA in FCM in order to assess whether current alternatives are potentially dangerous (or present a hazard) for the consumer.

Methodology

FCM containing BPA are polycarbonate and epoxy resins. The identification of alternatives to polycarbonate and epoxy resins was done based on an advice from the Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail (ANSES) (ANSES, 2013), the ALTPOLYCARB project report (Van Hoeck *et al.*, 2016), opinions from the Superior Health Council (SHC) (Geens *et al.*, 2012a; SHC, 2010; 2012) and information obtained through a (limited) study of the scientific literature. In this way, a non-exhaustive overview of alternatives was obtained without the functionality and properties of these alternatives being evaluated in comparison with the original materials.

Regarding the toxicological concerns of the alternatives to BPA in FCM, bisphenols other than BPA, namely bisphenol AF (BPAF), bisphenol B (BPB), bisphenol E (BPE), bisphenol F (BPF) and BPS were selected. An analysis was made based on studies examining an acceptable amount of samples and/or studying properties of multiple bisphenols. Without being exhaustive, this part of the advice provides a good general picture of the main toxicological aspects of bisphenols other than BPA.

The advice is also based on expert opinion.

Result

The alternative materials for polycarbonate based on BPA are polycarbonates based on a compound other than BPA, plastics other than polycarbonates and other non-plastic materials. The alternative materials for epoxy resins based on BPA are epoxy resins based on a compound other than BPA, resins other than epoxy resins and materials other than resins.

A risk assessment was performed for bisphenols other than BPA, namely BPAF, BPB, BPE, BPF and BPS. In the hazard identification and characterization, the effects of alternative bisphenols on human health are described based on toxicokinetic and toxicodynamic data collected in literature. In the exposure assessment, exposure to alternative bisphenols is estimated based on migration from FCM and concentrations in human matrices. The risk linked to exposure to bisphenols other than BPA is characterized in comparison with that linked to exposure to BPA.

Conclusion

The term “alternatives to BPA in FCM” can be viewed very broadly. FCM containing BPA are polycarbonate and epoxy resins. Alternatives to BPA in FCM can be sought from three different angles, namely the replacement of BPA by a different monomer for the production of polycarbonates and epoxy resins, the replacement of polycarbonate and epoxy resins by another plastic or resin without BPA, and the replacement of polycarbonate and epoxy resins by a completely different material. The advice provides an overview of possible alternatives to BPA in FCM.

The toxicological concerns of some bisphenols other than BPA, namely BPAF, BPB, BPE, BPF and BPS in FCM are described in the advice in the context of the risk assessment. The scientific literature shows that the bisphenols other than BPA also show estrogenic and antiandrogenic effects. Depending on the component, the hormone-disrupting effects in certain models may be more or less pronounced than those of BPA. On the other hand, it appears that the other bisphenols migrate less rapidly and in lower amounts than BPA, so that the risk due to exposure could be lower than the risk associated with BPA.

The full text is available on this website in dutch and in french.