

## **Advice 22-2020 of the Scientific Committee established at the FASFC on evaluation of the FASFC analysis programme for exogenous contaminants: B. Persistent organic pollutants (POPs)**

### **Background & Terms of reference**

Within the framework of a periodic evaluation of the analysis programme of the Federal Agency for the Safety of the Food Chain (FASFC), the Scientific Committee has been asked to discuss the programming of the analyses with regard to exogenous contaminants in food, in water intended for consumption and water used by operators in the transformation and treatment process of food, in animal feed, and in fertilisers, soil improvers and cultivation substrates. In particular, it is requested (i) to verify whether control results reported between 2010 and 2018 point to possible trends, and (ii) to assess the implementation of the approach generally applied within the FASFC for the programming of analyses (i.e. the control efforts in terms of, inter alia, the chosen "matrix/hazard" combinations and the number of analyses programmed for these combinations) and to identify possible gaps within the analysis programme.

'Exogenous contaminants' includes a large group of parameters including heavy metals, environmental contaminants (persistent organic pollutants), migrating components from materials and articles in contact with food as well as radiation and radioactivity. This opinion only covers programmed analyses and control results of persistent organic pollutants (POPs).

POPs are toxic organic pollutants that are sparingly soluble in water and that remain in the environment for a very long time (several years or decades). POPs tend to bioaccumulate in the adipose tissue of living organisms and can biomagnify in the food chain. POPs included in the current FASFC analysis program are dioxins and polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), poly- and perfluoroalkyl substances (PFAS), in particular perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA), the brominated flame retardants (BFRs) polybrominated diphenyl ethers (PBDEs) and hexabromocyclododecane (HBCDD) and pentachlorophenol (PCP). This opinion focuses mainly on these POPs.

### **Method**

The programming of the analyses is evaluated on the basis of expert opinion in combination with information from scientific literature and an evaluation of possible trends in the FASFC control results. Possible trends are discussed by means of a trend analysis via logistic regression. The period under consideration concerns 2010-2018, but is -depending on the available data- shorter for a number of 'matrix/hazard' combinations.

### **Conclusions & Recommendations**

In the opinion, the different trends observed on the basis of the levels reported in the FASFC control programme for heavy metals in different products of the Belgian food chain, are discussed in detail. It is noted that the trend analysis involves a number of uncertainties related to the sampling plan, the analytical method of the contaminant in question, data collection and reporting. It is not because a trend is observed on the basis of the statistical model, that the trend is also relevant. The detailed results of the trend analysis annexed to the opinion should therefore be interpreted with necessary caution.

The results of the trend analysis, which should thus be regarded as a pragmatic tool for the evaluation of the analysis programme, in combination with information from scientific literature and expert opinion, were assessed against the control efforts foreseen in the analysis programme 2020.

Based on available results, dioxin and dioxin-like PCB levels have decreased or remained stable in most feed and food, whereas non dioxin-like PCB levels have increased in different matrices. Likewise, PAH levels show a stable to decreasing trend in most of the matrices considered. Moreover, the reporting frequency for PAHs in feed and water is low to very low.

Due to a too low reporting frequency for PFAS and an unclear reporting of results for BFRs, no trend analysis was performed for these POPs. All results for PCP were below the reporting limit.

Given that contamination with POPs can always occur unexpectedly, further follow-up of these parameters remains relevant regardless of any decreasing trend observed.

The Scientific Committee gives generally a favourable opinion with respect to the proposed analysis programme for POPs in food, in water intended for consumption and used by operators, in animal feed, and in fertilisers, soil conditioners and cultivation substrates, but has a number of recommendations.

Given the relatively high reporting frequency of PAHs in molluscs and the lower metabolic potential of molluscs for PAHs compared to fish, it is recommended to include more analyses of molluscs in the programming of PAH analyses of fishery or aquaculture products and preparations. Based on the FASFC control results of 2010-2018, dried garden herbs also appear to be a relevant category to be sampled for PAH analyses. However, it could be considered to programme these analyses not every year, but e.g. every two years. Relatively high levels of PAH were reported in tea as well. Although legislation sets no maximum levels for PAHs in tea, it would be interesting to monitor PAH levels in this product group as well.

With regard to the PFAS, it can be considered not to program analyses every year, but rather in a rotational manner, given the low reporting frequency of perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) in the foods sampled between 2010 and 2018. Fishery and aquaculture products appear to be the most relevant matrices on the basis of literature and of control results.

Despite the low reporting frequency and low levels reported for polybrominated diphenyl ethers (PBDEs) and hexabromocyclododecane (HBCDD), further monitoring of flame retardants in food remains necessary. These analyses do not need to be carried out annually, but on a regular basis to have an idea of the trend in contamination levels. Fish appears to be a good sentinel for the monitoring of these environmental contaminants, but game and meat from older animals are also relevant matrices. Since the use of certain BFRs has been restricted or banned in Europe, it is strongly recommended to shift the focus from PBDEs and HBCDD to the new generation of flame retardants such as phosphate flame retardants that are increasingly used to replace BFRs in recent years.

Concerning the analysis of POPs in water, only analyses of PAHs are provided. PAHs are poorly soluble in water and have been rarely found in water intended for consumption and in water used by operators. It may be considered to include no longer these analyses in the FASFC analysis programme. PFAS, on the other hand, are water soluble and lipophobic, and can end up in (ground) water. Although limit values are not yet available in legislation, a monitoring of PFAS in water seems appropriate.

Based on the results and compared to the number of analyses programmed for cereal products and by-products, it seems for animal feed appropriate to programme more PAH analyses of artificially dried (raw) fodder.

Analyses of PFAS or BFRs in animal feeding are not included in the FASFC analytical programme, although these compounds may be present in animal feed and transfer from feed to food of animal origin is possible. However, too little is known about the occurrence of these compounds in animal feed to be able to estimate the priority of such analyses. Moreover, the reporting frequency for these compounds in food of animal origin in the FASFC control programme is very low. On the basis of current information and in the context of a surveillance plan aimed at the whole food chain, the Committee considers that the analysis of PFAS and BFRs in animal feed is, for the time being, less of a priority.

The programmed analyses of POPs in fertilizers, soil improvers and cultivation substrates only concern non dioxin-like PCBs in sewage sludge. In the context of circular economy and the use of organic fertilisers and fertilisers based on e.g. bio-waste, an exploratory study of POPs, e.g. of PAHs in sewage sludge, compost or digestate, could be useful to have a better idea about the relevance of such parameter-matrix combinations for the analysis program.

Finally, with the aim of a better valorisation and processing of control results, it is recommended to implement additional automatic quality control at data entry and to ensure consistency of units.

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