

Advice 02-2019 of the Scientific Committee established at the FASFC on the FASFC analyses program regarding process contaminants

Background & Terms of reference

In the context of a periodic evaluation of the analyses program of the Federal Agency for the Safety of the Food Chain (FASFC), the Scientific Committee has been asked to evaluate the analyses program of process contaminants. More specifically, it has been asked to evaluate if results for acrylamide (AA), furan, ethylcarbamate (EC), 2- and 3-monochloropropanediol (2- and 3-MCPD) and their fatty acid esters, and glycidyl fatty acid esters (GE) indicate potential trends and to identify possible gaps in the analyses program.

In addition, it is specifically requested in the context of the programming of analyses to assign a score to the harmful effect of the fatty acid esters of 2- and 3-MCPD and of GE.

Methodology

The programming of analyses has been evaluated based on expert opinion in combination with information from scientific literature and an evaluation of possible trends in the FASFC control results. Possible trends are discussed based on trend observation and verified through trend analysis by means of logistic regression. The period considered concerns 2008-2017 but is - depending on the available data - shorter for several "process contaminant / food" combinations.

Discussion

The FASFC uses a general risk-based approach for programming the analyses of hazards in the food chain. This approach is based on a score that is assigned to three criteria, namely (i) the harmful effect of the contaminant to be controlled, (ii) the occurrence of the contaminant in the group of products to be controlled, and (iii) the proportion or contribution of this group of products to be controlled to the total contamination in the food chain or the exposure. The Committee has no remarks regarding the scores assigned to these criteria for AA, EC and 3-MCPD. Nevertheless, it is noted that for EC the number of analyses to be programmed based on these scores is relatively high compared to AA and furan whereas EC can mainly occur in one type of product (i.e. liqueurs) and furan and AA in a whole range of food. For furan, the Committee proposes to increase the score for the contribution of the group of products to be controlled to the total exposure from 2 to 3 (i.e. from "average" to "important contribution"), since the products to be controlled contribute the most to the furan intake.

Based on the toxicity information available, the Committee proposes to assign a score of 3 (i.e. "severe") to the harmful effect of 3- and 2-MCPD fatty acid esters and to GE. This is the same score as assigned to the harmful effects of AA, furan, EC and 3-MCPD.

In the opinion, potential trends of process contaminant levels reported in food on the Belgian market within the framework of the control program are evaluated. However, the observed trends should be interpreted with due caution, taking into account sampling plan and analytical method of the contaminant in question. Moreover, for a number of process contaminant-food combinations, the number of results is very limited and only relates to 2 years.

Between 2008 and 2017 AA was found in 67% of the 1,988 food samples analysed. A decrease in AA content is observed in biscuits intended for toddlers and infants, in toasts, in cereals and in popcorn. In (baked) fries and instant coffee, however, an increase in the AA content is observed from 2009 onwards.

Furan was found in 45% of 1,128 food analysed between 2008 and 2016. Highest furan levels were measured in coffee, with on average a lower content in soluble coffee compared to roasted coffee (coffee beans). However, no clear trend is observed regarding the furan content of coffee. On the contrary, an increase in the furan content of coffee substitute is observed, in particular after 2014. Another trend, possibly to be followed up and to be verified, concerns an increase in the furan content of non-alcoholic beverages (i.e. vegetable / tomato juice). Although no trend is observed in baby food, furan was found in 67% of the analysed samples.

EC was found in 48% of the 271 sampled alcoholic beverages, the majority of which are liqueurs. The EC content of alcoholic beverages shows an increase between 2008 and 2017. Prior to 2012, EC was also analysed in non-alcoholic beverages and vinegar. The detection frequency for these food was 4% and 27% respectively.

Regarding 3-MCPD and the fatty acid esters of 3-MCPD, the results for the period 2013-2016 are evaluated, while for 2-MCPD, the 2-MCPD fatty acid esters and GE only results for 2015 and 2016 are available in the database. The detection frequency is 29% for 3-MCPD (total of 406 samples), only 5% for 2-MCPD (188 samples), 28% for the 3-MCPD fatty acid esters of (288 samples), 19% for the fatty acid esters of 2- MCPD (188 samples) and 20% for GE (188 samples).

Most analyses of 3-MCPD were performed on soy sauce and baby food. Despite the relatively low detection frequency, a decrease in the 3-MCPD content is observed in soy sauce between 2013 and 2016. In bread (mostly sourdough bread), on the other hand, an increase in the 3-MCPD content is observed.

In general, there are too few results available to identify possible trends, particularly with respect to 2-MCPD, the 2-MCPD fatty acid esters and GE.

Conclusions & Recommendations

For AA, EC and 3-MCPD, the Scientific Committee has no remarks on the scores attributed to the criteria on which the methodology for the programming of the analyses is based. Nonetheless, for EC the number of analyses obtained through the general methodology is relatively high compared to AA and furan. If a review of the methodology is considered, this could be taken into account.

Regarding furan the Committee proposes to increase the score with respect to the contribution of the group of products to be controlled to the total exposure. For the harmful effect of the fatty acid esters of 3- and 2-MCPD and of GE a score of 3 (i.e. "severe") is proposed.

Based on results reported during previous years in the context of controls, possible trends regarding the process contaminants levels in several foodstuffs are discussed and a number of recommendations with regard to the choice of matrices to be analysed are formulated. However, in several cases there appear to be too few results to identify possible trends, particularly for 2-MCPD, the 3- and 2-MCPD fatty acid esters and GE.

Finally, the Scientific Committee formulates a number of recommendations to increase the quality of data reporting.

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