Advice 35-2010 Risk assessment of *Listeria monocytogenes* in smoked salmon (self tasking initiative)

The FASFC performs yearly a large number of analyses within the framework of the control program. In this advice the fitness of the analyses results for '*Listeria monocytogenes* in ready-to-use food' was evaluated for use in a quantitative risk assessment. As a case-study, '*Listeria monocytogenes* in salmon' was chosen.

In a first probabilistic risk assessment the mean number of listeriosis cases caused by eating salmon was estimated based on the analyses for *Listeria monocytogenes* on salmon between 2002-2005 (conservation at 4°C during 2/3th of the shelf life and conservation at 7°C during 1/3th of the shelf life). Depending on the chosen probabilistic distribution, the mean number of listeriosis cases was estimated between 0,2 and 1 per year. On one hand this number is an overestimation because of the assumption that the salmon is consumed at the end of the shelf life; on the other hand this number is an underestimation since the variability of temperature during distribution and conservation by the consumer is not taken into account.

In a second probabilistic risk assessment the number of listeriosis cases was estimated by simulating the growth of *Listeria monocytogenes* in smoked salmon for different scenarios. This assessment is based on the analyses results for *Listeria monocytogenes* in smoked salmon between 2006 and 2009. The analyses were obtained from the transformation sector (verification of compliance with the criterion 'absence in 25g'), supplemented with analyses results for the tests 'detection in 1g' and 'count' (on request of the Scientific Committee following this case study). The mean estimated number of listeriosis cases by consuming smoked salmon, and after simulation of the growth under the same conditions as in the first risk assessment, is between 1 and 1,6 cases (depending on the chosen probabilistic distribution). When using the model with conditions that are more consistent with reality (use of a temperature distribution in the chilled distribution and in the refrigerator of the consumer, assumption of consumption on 75% of shelf life and assumption that half of the total conservation time of smoked salmon took place in the distribution and the other half in the refrigerator of the consumer) and after simulation, the number of listeriosis cases by consumption of smoked salmon was estimated to be 3,1. In 2008, 53 times *Listeria monocytogenes* was detected in humans in Belgium. These data suggest that smoked salmon is one of the foods that contribute to the exposure. By using scenario analysis the impact of conservation temperature of smoked salmon in the distribution and in the refrigerator of the consumer on the number of listeriosis cases was evaluated. This showed that the influence of the temperature in the refrigerator of the consumer had the largest influence. Also the impact of shortening the shelf life was evaluated: e.g. the number of listeriosis cases diminished with a factor 5 when the consumption was assumed on 50% of the shelf life instead of 75% of the shelf life.

In general, the analyses results performed for the control program for *Listeria monocytogenes* (verification with the criteria of Regulation 2003/2005) are not appropriate for performing a probabilistic risk assessment. These data could be useful (under the condition of certain assumptions) for the performance of a probabilistic risk assessment if they were supplemented with additional analyses (counts or detection with a modified detection limit).

The Scientific Committee recommends to determine the goals before performing a risk assessment. For example, the type of required data will vary according to the pursued goal. When it is e.g. the purpose to set a comparative risk rank of foods in the distribution, it would be more appropriate to use data coming from the distribution. However, when it is the purpose to evaluate the impact of certain interventions (e.g. a shorter shelf life) it is required to get data from the transformation sector. When performing an estimation of exposure based on analyses from the transformation sector, it is required to use a growth model for *Listeria monocytogenes* in the concerned food and to gather numerical data on the intrinsic properties (e.g. pH and aw) and on the extrinsic circumstances (e.g. temperature and conservation time).

For the FASFC it is useful to rank the different food stuffs according to the risk of listeriosis for the consumer. Subsequently, this information could be used for future adjustments on the control program. The study presented in this advice, is the methodological base for this, more extensive, ranking.

The full text is available on this website in dutch and in french, respectively under the section "Wetenschappelijk Comité/Adviezen" and "Comité scientifique/Avis".