

## **Advice 15-2012 of the Scientific Committee of the FASFC on the prevention, detection, fast tracing and management of outbreaks of human pathogenic Verotoxin producing *Escherichia coli* in the food chain**

Given the severity of the outbreak of *Escherichia coli* O104:H4 in the spring of 2011 in Germany and the related cluster in France, the Scientific Committee gives advice regarding the prevention, detection, rapid tracing and management of outbreaks of human pathogenic Vero(cyto)toxin producing *Escherichia coli* (VTEC) in the food chain.

Human pathogenic VTEC that are currently known and recognized as important in causing disease, contain genes for the production of Verotoxins (*stx* or *vtx* genes) and can contain a combination of the following virulence genes: genes for adhesion in the intestine (e.g. *eae* gene, *saa* gene, *lpf* gene), genes encoding other adhesion factors (e.g. 'Aggregative Adherence Fimbriae'), and their regulators. The *ehx* gene encoding enterohemolysin is sometimes found in human pathogenic VTEC.

Foodstuffs are screened using culture and molecular techniques such as PCR, which are mainly focused on the detection of *stx* genes and the *eae* gene. When the results are positive, it is strongly recommended to pick up the strains with immunocapture methods and/or (chromogenic) selective isolation media to confirm the presence of the above virulence genes in individual bacterial colonies. Confirmation via isolation of the strain is necessary as the molecular detection of a combination of virulence genes in foodstuffs does not exclude that virulence genes are present in different *E. coli* strains which individually are little or not pathogenic for humans.

The following foodstuffs can represent a risk for the consumer: raw (or undercooked) milk and dairy products made from raw (or undercooked) milk, raw (or undercooked) beef or meat from other (small) ruminants, fresh leafy vegetables and vegetables that are botanically fruits, sprouted vegetables, fresh aromatic (garden) herbs, soft red fruit and sliced and packaged fruit, vegetables and grains of the fourth gamma.

The Scientific Committee has no direct scientific basis to recommend to expand the control program of the FASFC in 2012 to the detection of other VTEC serogroups compared to the serogroups examined in 2011. But it is recommended to annually evaluate the control program with respect to human pathogenic VTEC in function of the knowledge about circulating human pathogenic seropathotypes, to control the management of faecal contamination through analysis of *E. coli*, in parallel with controls of VTEC, and also, in addition to the screening for the presence of *stx* genes and the *eae* gene and priority VTEC-serogroups, to pay attention to the presence of the combination of relevant virulence factors, and this at the suggestion of the National Reference Laboratory (NRL) for VTEC, the European Reference Laboratory (EU-RL) for VTEC or other expert research groups.

The Scientific Committee recommends that the FASFC monitors the use of good hygienic work practices during both the animal and the plant production. The importance of the personal hygiene, and especially the hand hygiene of the personnel involved in all stages of the food chain should be emphasized. The sector guide for the primary production and the sector guide for the potato, vegetable and fruit processing industry should be extended with specific recommendations for high risk products such as leafy vegetables, fresh garden herbs and sprouted vegetables. At the level of the primary plant production and processing, sufficient guidance and information should be provided with regard to the microbiological hazards and the possible transmission routes to humans. The use of water with an adequate microbiological quality must be a particular point of attention.

In the medical sector, there is a need for good communication between clinical laboratories and a fast and efficient reporting on one central point of the hemolytic uremic syndrome (HUS) in humans, also with regard to the characteristics of the isolates (virulence, serogroup, ...). All cases of bloody diarrhea and HUS must be investigated on the basis of microbiological diagnosis and consequently, all the resources that make this possible, must be provided to the medical sector. Furthermore, there is a need for a good interaction and coordination and an adequate exchange of information between the various national and European reference laboratories for the analysis of VTEC in samples from humans, animals and food. The Scientific Committee strongly supports the continuous updating and verifying of an adequate crisis and communication plan so all stakeholders (government, laboratories, knowledge centers and involved sectors) can quickly and appropriately and in concert respond and communicate for the early detection of food poisoning with human pathogenic VTEC.

Finally, it is recommended that the NRL for VTEC, the EU-RL for VTEC or other expert research groups develop molecular techniques that provide a fast and efficient way of screening cultures and isolates for the presence of a wide range of virulence factors. Attention should also be paid to the development of better detection methods, especially in products with a high microbiological load, such as an accumulation step prior to the screening with, for example, PCR.

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