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**From "Farm-to-Fork" - How to Improve Surveillance of the Food Supply Chain**

**Submitted by Germany**

1. According to WHO/FAO options foods are a potential target of terrorist attacks. From the past we know, foods can be a medium for biological as well as chemical agents. Numerous outbreaks caused by foods can be seen as proof, for example, an outbreak with terrorist background in the USA in 1984. Salad bars were contaminated in restaurants with *Salmonella typhimurium* by a religious organization. But also unintentional outbreaks show the possible dimension of outbreaks associated with food. They provide an indication of the vulnerability of the food chain ("Farm-to-Fork"-Chain). Besides the target of causing disease or death to a large part of the population, considerable economic and social damages, as well as panic in population can be caused with a relatively low efforts by terrorist attacks with foods. For the country concerned these threats have long-term consequences. Therefore the "Farm-to-Fork"-Chain must be regarded as an attractive target for terrorist groups.

2. In Germany the processing of foods is protected through a multitude of control systems by the industry (HACCP) and national institutions (monitoring programs, surveillance systems, traceable products, food import inspections, national outbreak alert systems, poison control centers). In spite of these well functioning systems, the entry of agents into the food chain cannot be ruled out. Particularly agents not naturally expected in certain foods would be insufficiently detected by these systems. Generally bacteria, viruses, toxins, mycotoxins, chemicals and radioactive substances are considered as potential agents.

3. The entry of contaminants may occur at many various levels within the "Farm-to-Fork"-Chain (farm, production, harvest, transport, before, or during as well as after the processing, trading).

4. The process mostly contains steps which have an influence on growth or inactivation of bacteria and on other agents (e. g. pasteurizing, acidification, salting, freezing). On this account different scenarios must be regarded for possible agent-food-combinations, which consider the special characteristics and production processing of foods as well as the special characteristics of

agents. The possible entry of botulinum-toxin into the milk production is viewed as an example. Generally a high priority in risk assessments connected with terrorist attacks should be given to such foods, which are processed in large quantities, stored and transported, which are unprocessed, rawly consumed, geographically widespread and which are consumed by a high percentage of the population.

5. Through risk assessment in the "Farm-to-Fork"-Chain, the food chain will become safer. But it seems nearly impossible to ensure complete security. Therefore the security systems of recognition, clarification and reaction to corresponding health and economic damages caused by terrorist attacks to the "Farm-to-Fork"-Chain are subject of review for efficiency of possible attacks. This is the precondition for taking suitable measures (e.g. decontamination, vaccinations, recall of relevant foods) in order to limit, both the degree of diseases or/and the economic damages. Components with essential influence on time for recognition of such an outbreak are the incubation time, the time necessary for correct diagnosis by the attending physicians, the speed of forwarding to national authorities, the identification of the source of outbreak and the recognition of a terrorist background. In the food sector the identification of the causing food comprises considerable uncertainties with regard to the estimation of necessary time.

6. On the one hand laboratory methods for detection of the agents in foods are partly less specific and sensitive as in human sample material, and on the other hand partly detection methods are not available. In atypical contaminant-food-combinations, that nobody really expects, a recognition by means of epidemiological methods would be delayed and difficult.

7. In Germany reliable instruments for surveillance and clarification of disclosure of diseases caused by foods exist. They are based on the Protection against Infection Act.

8. In order to be able to apply these already existing resources in case of terrorist attacks, a close collaboration of several institutions, public authorities and the industry is essential. Furthermore it is necessary to provide additional laboratory capacities, to develop faster and specific analytical methods and to train the attending physicians. In contact at the measurement for an expected potentially terrorist attack, it is essential to assume that corresponding capacities in the health system (hospital beds, vaccine) are available.

9. Only with fast and well coordinated networks the personnel and economic damages can be kept at a minimum. These networks must be created. They have to be coordinated by the national authorities. The aim must be to protect the foods as well as possible against terrorist intervention, to uncover and to remove weak points in clarification, as well as to acquire and to test emergency plans for possible terrorist attacks.

10. Further details and additional information are available on the CD-ROM prepared by the Federal Foreign Office for participants at the BTWC Meeting of Experts in July 2004.

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