

Risk Management of Dioxins in Feed by the German Federal Ministry of Consumer Protection

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Introduction

The dioxin exposure of the German population is 90% attributable to foods of animal origin. Feedingstuffs are the main input source of dioxins in foods of animal origin. Due to carry-over, dioxins turn over from feedingstuffs into foods of animal origin and accumulate. Dioxins in the environment are mostly the result of industrial through emissions, which also contaminates plants and feedingstuffs of plant origin. Dioxin intake of plants by the root is generally negligible. Dioxins in feedingstuffs can also be generated in the production process or are connected with the geological origin of the raw materials. With regard to the measures to reduce dioxin levels in feedingstuffs, the European Community follows a scheme based on maximum levels, action levels and target values. If the maximum levels are exceeded it is no longer allowed to market or use as feedingstuffs¹. The so-called "dilution" by blending is also not permitted. In case action levels are exceeded the authorities must take measures together with the industry to identify the source of the dioxin contamination and eliminate it as possible². No target values have been determined until now. They are to be based on the recommendation of the SCF on the "acceptable weekly intake" of 14 pg WHO-TEQ/kg body mass and week for the adult human³. In the framework of official supervision, increased dioxin levels were detected in different feedingstuffs and additives in the last years. I would just like to mention the detection of high dioxin levels in citrus pellets, aspiration dust from cereal cleaning, kaolinitic clay, fatty acids, mineral additives, potato peels and dried feedingstuffs. These results show that under a dioxin minimization strategy the manufacturing process of feedingstuffs must also receive particular attention. The "Code of Practice for the prevention and reduction of dioxin and dioxin-like PCB contamination in foods"⁴, which is currently being elaborated in the Codex Alimentarius, particularly aims at identifying the measures to reduce dioxin levels in the production and use of feedingstuffs.

Material and Methods

The development of suitable management measures requires an assessment of the initial situation. The results of the official animal feed surveillance in Germany and the results of a comprehensive monitoring program, which is carried out on the basis of Recommendation 2004/704/EC of the European Commission in all Member States of the European Union, are available to the Ministry as data base⁵. In 2003, in Germany a total of 2,695 samples of feedingstuffs (including additives and premixtures) were tested in the framework of the official dioxin surveillance. Of the 2,584 feedingstuffs to which a statutory maximum level applies, 4.7 % gave cause for complaint. In 2002 the figure was only 1.6 %. The higher number of complaints in 2003 resulted from the targeted testing of certain feedingstuffs as a consequence of special events. Official surveillance is based on a risk-oriented approach. Therefore these data are not appropriate for an assessment of the dioxin contamination in animal feed. Therefore a status survey was carried out in Germany in 2004 to gain a representative overview of the actual dioxin levels in feedingstuffs. Status surveys are the appropriate tool for a representative description of the situation and for following the development over a number of years. This way it is possible to determine the starting point and success of minimization measures. In the framework of the status survey in Germany some 200 samples of different feedingstuffs were tested. The samples were taken in a representative way and not in the framework of a risk-oriented control. The results show that feedingstuffs in Germany have dioxin contents and dioxin-like PCBs which are far below the maximum levels in the European Union. This status survey is to be continued over several years in order to monitor the development. To provide a scientific basis to the results of the status survey, Germany started a multi-annual research project to examine dioxins and dioxin-like PCBs in feedingstuffs and foods of animal origin as well as a study on dioxins in foodstuffs of plant origin. The purpose of these projects was to determine and quantify the intake of consumers and the inputs into foodstuffs of animal origin through animal feed. The first results of the feedingstuff examinations confirm that the actual levels, in particular of roughage (silages), are far below the

maximum levels.

Results and Discussion

Calculations by experts assume that to comply with the “acceptable weekly intake“ indicated by the SCF, for instance in feedingstuffs for dairy cows (total ration), no more than 0.1 ng WHO-PCDD/F – TEQ/kg of dry matter may be contained⁶. These calculations assume an equal percentage of dioxins and dioxin-like PCBs in the WHO-TEQ and consider 1 pg WHO-PCDD/F-TEQ/kg body mass as an acceptable daily intake. By this calculation it is taken into account that in Germany about 50% of the dioxin consumption of a human is being taken in through milk fat⁷. In order to achieve this objective, the federal ministry pursues a minimization strategy for feedingstuffs, which includes the following elements: Reduction of dioxin emissions by environmental measures, ban of certain highly contaminated feedingstuffs from the feed chain, prevention of the contamination of feedingstuffs in the production process and the application of cleaning and decontamination processes in the case of feedingstuffs with higher dioxin contents. This strategy is implemented by administrative measures and by measures taken by the industry in their own responsibility. Maximum levels and action levels for feed are established in the European Community. Yet, in addition, production and substance-based rules are necessary. Germany, for example, introduced a compulsory statutory registration for the direct drying of feedingstuffs. Registered establishments must fulfill specific requirements to the drying process in order to avoid the contamination of dry feedingstuffs with dioxins. In addition, the industry should optimize the manufacturing processes to preventing dioxin contaminations in the framework of their quality assurance systems (this includes e.g. use of processing aids in the production process). It is also necessary to promote diligence and responsibility in the businesses where the by-products of the food industry to be utilized as feedingstuffs accrue. Guidelines for the good manufacturing practice may be an important instrument to this end. In Germany a so called the positive list for feedingstuffs, which lists all allowed feed materials, also supports the identification and prevention of risks related to dioxin contamination. Particularly hazardous substances (e.g. cleaning fractions accumulating in connection with cereal grain cleaning or oil refining) should not be used as feedingstuffs. There still is a considerable need for research to enforce the minimization strategy, especially with a view to clarifying the carry-over of dioxins and dioxin-like PCB of feedingstuffs into foods of animal origin, the development of rapid analytical methods for screening purposes at factory level and the development of cleaning and decontamination procedures.

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