



## Dioxin Contamination of feedingstuffs and their contribution to the contamination of food of animal origin

*Samenvatting, conclusies en aanbevelingen door "Scientific Committee on Animal Nutrition"*

### **Executive summary**

The SCAN has been asked to advise the Commission on the sources of contamination of feedingstuffs by polychlorinated dibenzo-p-dioxins and dibenzofurans, collectively known as dioxins, and by polychlorinated biphenyls (PCBs), including dioxin-like PCBs. Advice was also sought on the likely exposure of food producing animals (mammals, birds and fish) to dioxins and PCBs, on the carry-over of these compounds to food products of animal origin and on any impact of dioxins and PCBs present in feedingstuffs on animal health.

In reaching its conclusions, the SCAN has taken into consideration all of the available published data and additional information obtained by the European Commission from Member States and other sources. Account has been taken of the environmental sources of pollution resulting in the background contamination of all feed materials and also of any contamination specifically introduced by production conditions, feed processing and during the transport and distribution of feed materials and feedingstuffs. Because of the scarcity of reliable data on PCBs, these are not included in this analysis.

As a first task, SCAN prepared a list of typical diets for the main animal species and categories representative of those in common use within the European Union. Where possible, values for upper, lower and mean concentrations of dioxins for each feed material were taken from the available data. In practice, because of the scarcity of data and difficulty of analysis, some feed materials had to be grouped. The upper values used do not necessarily represent the highest percentile of the total data, but were more arbitrarily chosen to represent worst-case situations. For example, forages grown in proximity to a source of pollution can have upper values substantially higher than those of forages grown elsewhere. Particular attention was paid to soil as a source of dioxin contamination. Soil is deposited onto the aerial surfaces of all plants and is consumed by free-ranging animals before harvest and, in lesser amounts, by other animals post-harvest. The total dioxin concentration for each diet was then calculated using the low, mean and high values for the dioxin content identified for each ingredient or group of ingredients to identify the main sources of contamination.

### **The main SCAN conclusions are:**

- Fish meal and fish oil are the most heavily contaminated feed materials with products of European fish stocks (respective means (for dioxins only) of 1.2 and 4.8ng WHO-TEQ/kg DM) more heavily contaminated than those from South Pacific stock (Chile, Peru, respective means (for dioxins only) 0.14 and 0.61ng WHO-TEQ/kg DM) by a factor of *ca* eight.

- Animal fat (mean 1ng WHO-TEQ/kg DM) is next in order of dioxins concentration. Values observed depend on the bioaccumulation of dioxins in fatty tissues along the feed/food chain.
- All other feed materials of plant (roughages, cereals, legume seeds) and animal (milk by-products, meat and bone meal) origin contain mean concentrations of dioxins around or below 0.2ng WHO-TEQ/kg DM.
- Roughages present a very wide range of dioxin concentrations depending on location, degree of contamination with soil and exposure to sources of aerial pollution, justifying the use of a worst-case assumption in identifying relatively high mean and upper values.
- The limited data available on the contamination of feed materials by dioxin-like PCBs indicates that their inclusion would increase the TEQ value for feed materials of fish origin by a factor of five and that of other feed materials by a factor of two.
- The contribution of individual feed materials to the dioxin content of the whole diet for farmed animals depends on the intrinsic degree of contamination and the proportion used in the diet. Greatest concerns arise from the use of fish meal and fish oil of European origin. These are most critical when used in diets for farmed fish and where fish meal is incorporated in diets of other food producing animals.
- The consumption of contaminated soil may drastically increase the exposure of grazing or free-ranging animals to dioxin. However, the bioavailability of dioxins adsorbed on mineral or organic soil particles is limited.
- The SCAN stresses that depending on the degree and position of chlorination, the individual dioxins (congeners) exhibit different transfer rates, and that it is not scientifically correct to calculate transfer from feedingstuffs to products of animal origin on a TEQ basis only. The exercise must consider the individual congeners.
- With regard to the impact of dioxins on animal health, the SCAN considers that no adverse effects from dioxins would be expected in mammals, birds and fishes exposed to the current levels of background pollution. Toxic consequences would be expected in animals challenged by severe accidental contamination with dioxins or PCBs.

### **SCAN recommendations:**

The reduction of human exposure to dioxins related to food consumption is important to ensure consumer protection. Food of animal origin is a predominant source of exposure of consumers to dioxins. As food contamination is directly related to feed contamination, consistent cross-sectorial actions must be taken to reduce final dioxin impact on human health. An integrated approach should be followed to reduce the dioxin incidence all along the food chain *i.e.* from feed materials to food producing animals then to humans. Taking measures on feed materials and feedingstuffs is thus an important step to reduce the dioxin uptake by human.

As far as feed materials are concerned,

- Emphasis should be put on reducing the impact of the most contaminated feed materials, *e.g.* fish meal and fish oil from Europe, on overall diet contamination. This could be achieved by substituting the most contaminated by lesser contaminated

sources, by reducing their intrinsic contamination or by using non (less) contaminated alternatives, continuing to meet the animal nutrient requirements.

- Any material (recycled products, raw materials, ingredients) used in the manufacturing of feed materials should be guaranteed for quality and safety so that it would not become a source of contamination.
- Good manufacturing practices as well as use of Hazard Analysis and Critical Control Point principles should be introduced/continued at feed industry level to control the dioxin contamination along the different steps of the manufacture of feed.
- Efforts should be made to reduce dioxins contamination of feed resources at farm level (Good agricultural practices) and controlling local conditions of livestock