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Press Relations Officer: Martin Ittershagen
Deputy Press Relations Officer: Stephan Gabriel Haufe
PR-staff: Dieter Leutert, Fotini Mavromati, Doreen Redlich, Martin Stallmann
Address: Postfach 1406, 06813 Dessau-Roßlau
Telephone: +49 340/2103-2122, -6625, -2250, -2318, - 2367, -2507
E-Mail: pressestelle@uba.de
Internet: www.umweltbundesamt.de

Umwelt Bundes Amt
Für Mensch und Umwelt

Dioxin in animal feed: Source of contamination not yet decisively identified

Federal Environment Agency (UBA) finds no clues to possible source in own dioxin database – urges improvement of data availability

The sources of the current dioxin contamination in animal feed, eggs and meat have yet to be conclusively determined. "The distribution pattern of the dioxins, furans and dioxin-like PCB in the contaminated feed does not correspond to a single reference sample of ours", said UBA President Jochen Flasbarth. UBA compared the milk fat fatty acids illegally added to the animal feed with some 46,000 samples from soil, air, plants and animals in its dioxin database. In the past, the database has often provided a clue as to the source of dioxin contaminations. The chemical formula of dioxins, furans and dioxin-like polychlorinated biphenyls are quite discernible (so-called congener profiles) depending on their origin and formation.

UBA's analysis did, however, succeed in ruling out some sources such as the metal and cement industries, and neither can other industrial sources be linked to the current contaminations. The congener profile of the milk fat fatty acids in the contaminated feed shows no similarities to existing environmental samples. Data on dioxin emissions from other industries also reveal no evident matches that might point to an industrial source.

By way of comparison outside tests on waste and transformer oils were also reviewed, the results of which show similarities with the milk fat fatty acid congener profile. The database is too limited, however, to draw any valid conclusions. The most recent investigations done by the Chemisches und Veterinäruntersuchungsamt Münster-Emscher-Lippe, which were publicised today, support the hypothesis that the contamination stems from industrial fats which should not have been used to produce animal feed and other foodstuff.

Nevertheless, the evaluation points to the great advantages that a comprehensive dioxin database has. "The current dioxin situation should provide the impetus to expand the knowledge base on dioxins significantly, especially as concerns emissions, animal feed, products and preparations. This will allow to make robust conclusions about the sources of contamination, which will help make animal feed and food for human consumption safer," said UBA President Flasbarth.

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Background: Dioxin – what is it?

Dioxin commonly refers to a group of chlorinated dioxins and furans of similar chemical structure. The substance dioxin does not exist as such, but is rather a group of dioxin compounds which are comprised of 75 polychlorinated dibenzo para dioxins (PCDDs) and 135 polychlorinated dibenzofurans (PCDF). Certain dioxin-like polychlorinated biphenyls with similar toxic properties are also included under the term "dioxins".
Dioxins have never been produced deliberately. They are the unwanted by-products of all manufacturing firing processes that apply chlorine and organic carbon under certain conditions, for example at high temperatures. Dioxin is produced at temperatures of 300 °C and higher and destroyed at temperatures over 900 °C. Dioxins can also be released by forest fires and volcanic eruptions. Dioxins have also been found in 200 million-year-old kaolinite soil.
In the 1980s, dioxins were released to the environment every year on a scale of several kilogrammes in dioxin-loaded chemicals contained in certain herbicides, for example pentachlorophenol and polychlorinated biphenyls (PCB). At abovementioned temperature levels, these substances can themselves produce additional dioxins. They have in the meantime been banned by statutory laws. Waste incineration used to be the main source of emissions to air, but thanks to rigorous caps and technology, there are virtually no dioxin emissions from waste incineration installations nowadays.
Human dioxin absorption is 90-95 percent from food intake. Nearly two-thirds of this intake occurs through consumption of meat and dairy products. The dioxin contamination levels in fish are relatively high, depending on their fat content.

Survey of dioxin database stock: http://www.pop-dioxindb.de/d/stat_r_datenuebersicht.html
More information about dioxin:
http://www.umweltbundesamt.de/chemikalien-e/dioxine.htm
POP Dioxin Database:
http://www.pop-dioxindb.de.

Dessau-Roßlau, 21 January 2011