REGULATORY AND RESEARCH ACTION IN THE NETHERLANDS.

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Abstract: The main stream of government sponsered research during the last year was directed to the PCDD/PCDF emission of municipal waste incinerators and other sources and to levels in dairy products and meat. Two municipal incineration plants were closed and more are likely to follow. A ban for polybromo biphenyl and polybromo biphenyl ether flame retardants is in preparation.

Incineration guideline 1989.
The emission standards of the Incineration guideline of august 1989 have been criticized extensively by the Association for the Incineration of Municipal Waste in the Netherlands. After a feasibility study it was decided in february of this year that these standards will be maintained and implemented in november 1993. The emission standard for PCDD/PCDF than will be 0.1 ng TEQ/m^3, calculated by use of the international toxicity equivalency factors.

Municipal solid waste incinerators.
The detection of high levels of PCDDs and PCDFs in cow's milk in the surroundings of the largest municipal solid waste incinerator (MSWI) in the country has led to a program of emission measurements at other MSWI's. Most incinerators appeared not even to meet the requirements of the Incineration Guideline of 1985 and are not worth the high investments necessary to meet the requirements of the Incineration Guideline of 1989. Because of their high emission of PCDD/PCDF, which ranged from 30 to over 100 ng TEQ/m^3, dust and other contaminants two MSWI's have been closed last spring and others are likely to follow soon.

Other sources.
A study on other sources of dioxins has been started and a priority list for emission measurements at the indicated sources has been drawn up. This list contains e.g. hospital waste incinerators, crematoria and industrial processes. Emission measurements have been accomplished for a copper reclamation furnace and the sinter plant of a steel factory. In both cases the emission of PCDD/PCDF (and of several other contaminants) exceeded the emission standards.
The use of sodiumpentachlorophenolate (NaPCP) to protect the wooden scaffoldings in mushroom nurseries has caused local PCDD/PCDF contamination of sediments of adjacant canals. These sediments sometimes have been spread over nearby pastures. Soil

contamination up to 1.1 ppb TEQ was detected. Application of PCP and NaPCP has been prohibited since january 1 1989.

PCDD/PCDF levels in dairy products and meat.
In the surroundings of MSWI's, a copper reclamation furnace and mushroom nurseries cow's milk and fat and meat of slaughtered cattle have been analized for PCDD/PCDF. Near the MSWI of Zaanstad levels up to 14 ng TEQ/g fat were found. Milk from the contaminated area now is collected, skimmed and the cream is destroyed. The incinerator was closed down in april this year. Selected dairy cattle farms in the area are incorporated in the existing milk monitoring program with the aim to follow the effect of this measure.
PCDD/PCDF levels on fat basis in milk, meat, organs and fat tissue of lactating cows appeared to be very close. In general levels found in sheep were higher than in cows.
The level, on fat basis, in milk from locations in the Netherlands with no known sources of contamination is about 2 ng TEQ/g.
Preliminary results from a study on the contribution of soil and grass to the PCDD/PCDF levels in milk in the surroundings of the MSWI AVR (near Rotterdam) indicate that the major route of contamination is the deposition on the grass. The contribution of of the soil is assessed to be 15-25 % for that area.

Toxicokinetic studies in cattle.
In a toxicokinetic study a mixture of eight ^{13}C-labelled PCDDs and PCDFs in olive oil was administered intraruminally to four lactating cows. For the most important congeners the resorption was about 30% and the biologic half life 40-50 days. For this mixture the biologic half life expressed in TEQs was 44 days. Studies in non lactating cows and in sheep are in progress.

Standards.
In july 1989 a preliminary standard for milk of 6 ng TEQ/g, on fat basis, was introduced.
An extensive study of the levels of PCDDs, PCDFs and selected PCBs in different foodstuffs and in duplicate meals has been started. The results of this study, together with the results of a study in which the intake of different foodstuffs by different age groups and sexes was determined, will be used for standard setting for foods.
In december 1990 WHO and the National Institute of Health and Environmental Hygiene of the Netherlands will organize an international expert meeting on the tolerable daily intake (TDI) of PCDD/PCDF. The aim is to attain broad consensus on this subject.

Flame retardants.
The government of the Netherlands is considering a ban on polybrominated biphenyl an biphenyl ether flame retardants.
A study on the behaviour of other brominated flame retardants under conditions of pyrolysis and fire has been started.