TRENDS IN EXPOSURE AND IN LEVELS IN HUMAN MILK

CONTAM Opinion on dioxins and DL-PCBs in food and feed

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Trends in human PCDD/F and DL-PCB exposure

- In the past, EFSA (2010, 2012) estimated the dietary intake of PCDD/Fs and DL-PCBs in feed and food and published the results in two technical reports

- In its **2012 report**, EFSA estimated the chronic dietary intake based on dietary surveys for 68 population groups across 17 European European Countries, covering 7 age classes

Exposure to the sum of PCDD/Fs and DL-PCBs was estimated considering **occurrence data for the period 2008–2010**

Trends in human PCDD/F and DL-PCB exposure

EFSA Technical report, 2012

- Based on occurrence data from 2008-2010, the chronic dietary exposure to the sum of PCDD/Fs and DL-PCBs was estimated (depending on the population group):

  average exposure:
  between 0.57 and 2.54 pg WHO_{2005}-TEQ/kg bw/day

  95^{th} percentile exposure:
  between 1.2 and 9.9 pg WHO_{2005}-TEQ/kg bw/day

- A general decrease in exposure to PCDD/Fs and DL-PCBs was observed between 2002-2004 and 2008-2010, estimated to be between 16.6% and 79.3% according to the different population groups

Trends in human PCDD/F and DL-PCB exposure

Present exposure assessment (PCDD/Fs + DL-PCBs)

Based on occurrence data from 2010-2016,

Mean exposure (for the different age groups):

0.39–2.57 pg WHO_{2005}-TEQ/kg bw/day

In good concordance with the chronic dietary intake estimated by EFSA (2012) (**0.57–2.54 pg WHO_{2005}-TEQ/kg bw/day**)

95th percentile exposure (for the different age groups):

0.90–6.6 pg WHO_{2005}-TEQ/kg bw/day

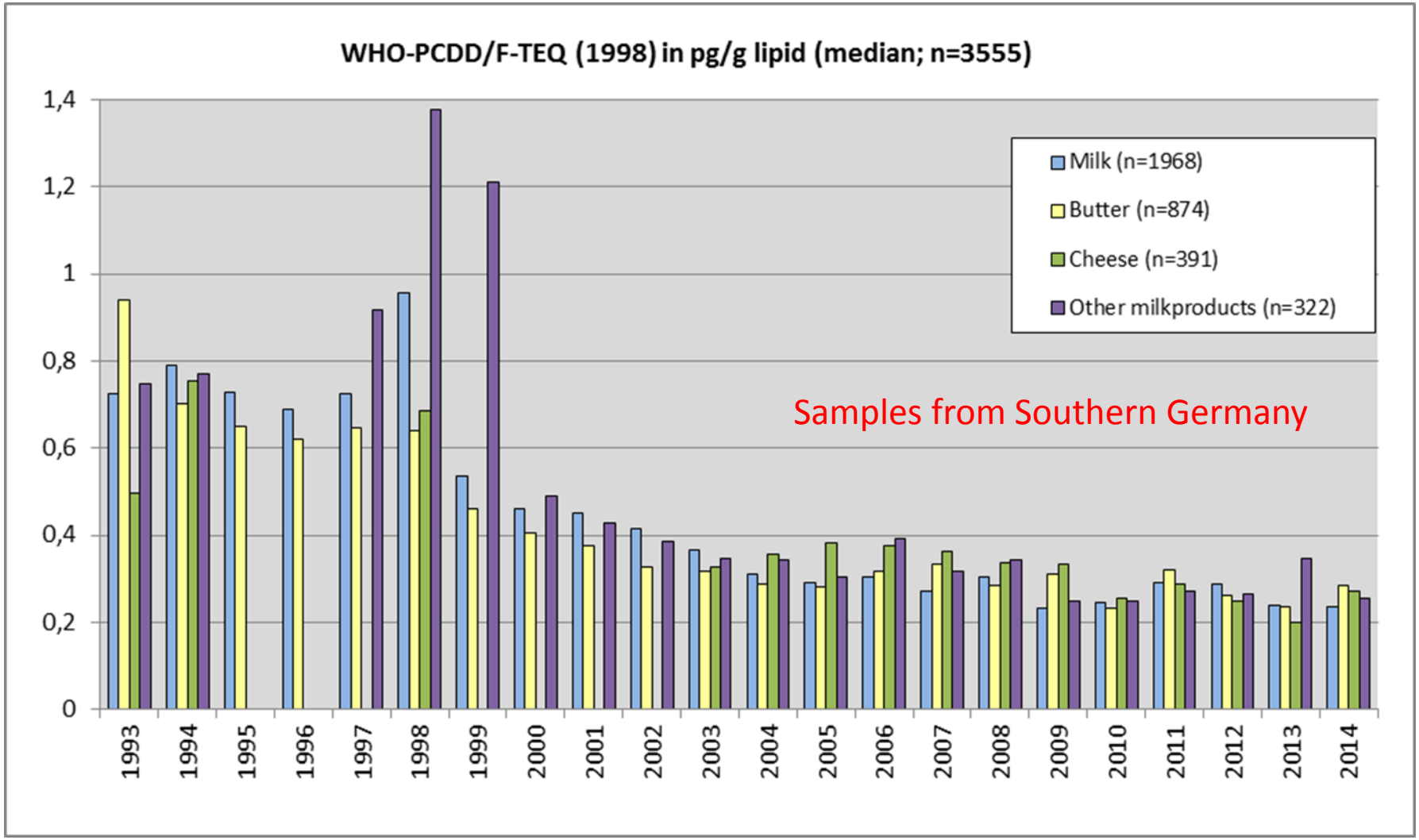
Slightly lower than the chronic intake estimated by (EFSA, 2012) (**1.2–9.9 pg WHO_{2005}-TEQ/kg bw/day**)

Trends in human PCDD/F and DL-PCB exposure

- The data indicate that the present mean human dietary PCDD/Fs and DL-PCB exposure has not substantially changed compared to estimates based on food samples collected between 2008 and 2010

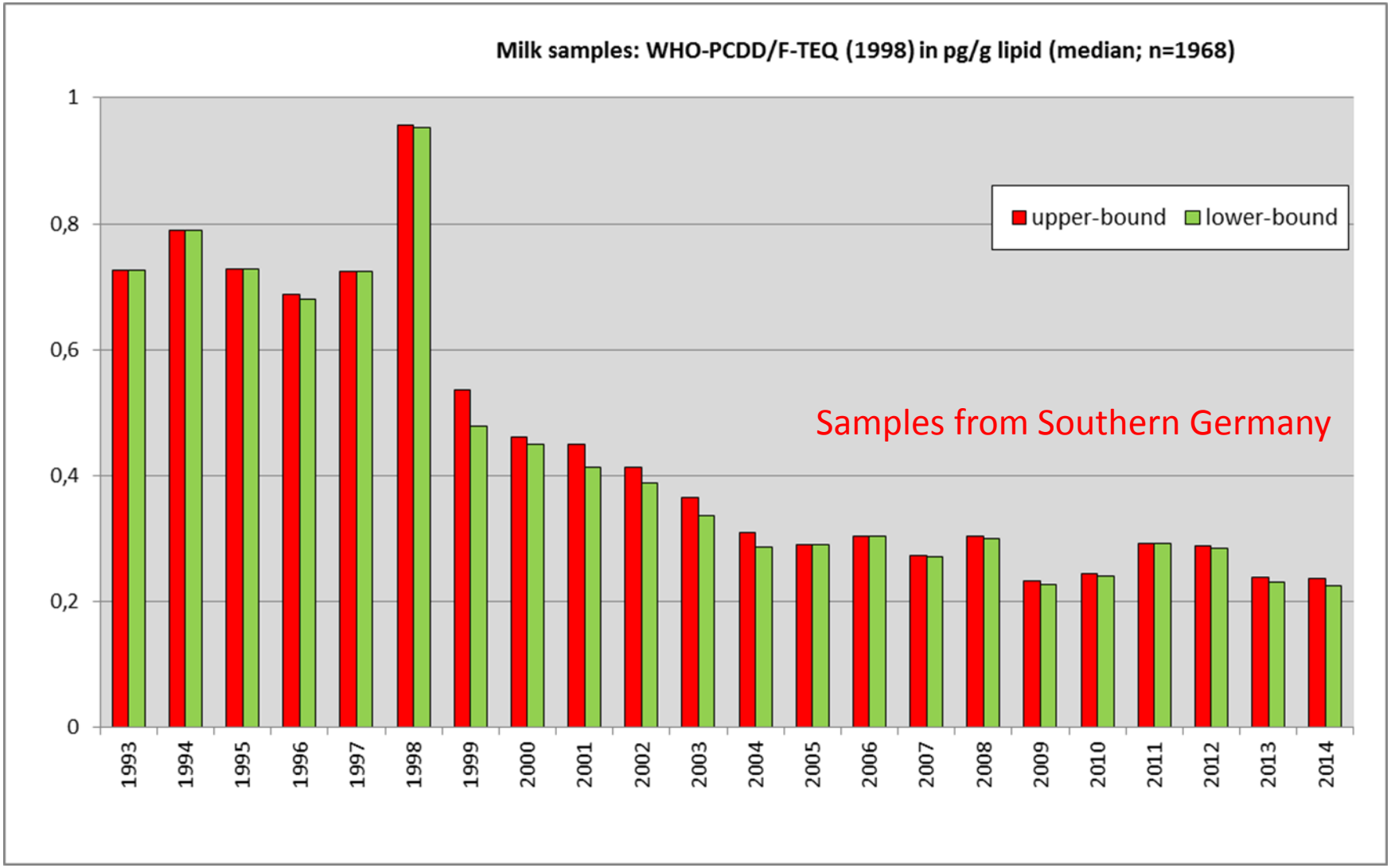
- This is substantiated by multiple year sampling and analysis of food samples from the same area which indicate a stagnation of the contamination as demonstrated in the following figures:

PCDD/Fs in dairy products 1993-2014



State Institute for Chemical and Veterinary Analysis of Food, Freiburg, Germany

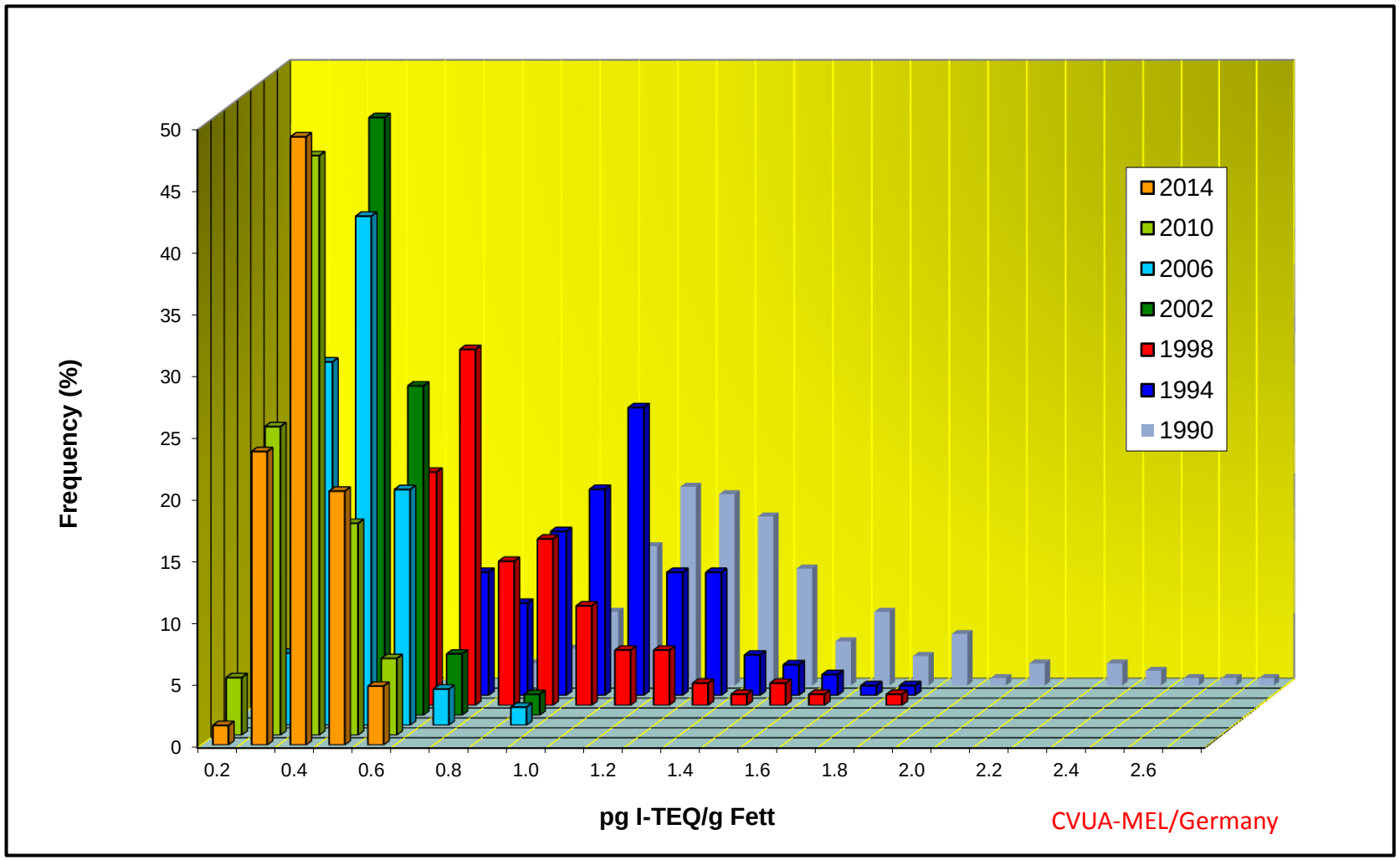
PCDD/Fs in cow's milk samples 1993-2014



State Institute for Chemical and Veterinary Analysis of Food, Freiburg, Germany

PCDD/Fs decline in dairy products

Samples collected in Western Germany 1990 – 2014 (n=> 600)



Trends on PCDD/Fs and DL-PCBs in human milk

- **Human milk** is an important matrix to globally survey the human PCDD/Fs and PCB exposure and to indicate temporal trends
- Studies with multiple year sampling and analysis in Germany revealed a decline of PCDD/F-TEQ of 80% between 1986-2009
- Analyses of archived pooled human milk samples collected annually between 1972 and 2011 in Sweden showed a statistically significant relative annual decline between 1972 and 2011 for PCDD/Fs and DL-PCB of 6.1 and 6.9%, respectively
- This is in agreement with another study from Sweden on human milk collected annually between 1996 and 2006 showing annual declines of 6.7, 4.6 and 6.5% for PCDDs, PCDFs and mono-*ortho*-PCBs

Trends on PCDD/Fs and DL-PCBs in human milk

- The data indicate a substantial global decline of PCDD/Fs and DL-PCB levels in human milk since the first measured samples collected in the early 1980s
- This demonstrates that the measures to decrease the environmental release were effective where applied
- However, available results from the last decade are quite similar. This may be an indication that the concentrations of PCDD/Fs and DL-PCBs in human milk are levelling off
- This hypothesis is substantiated by the stagnating occurrence levels in food considering that food is the major pathway of human PCDD/F and PCB exposure
- A final conclusion can only be drawn when data from future years of human milk monitoring are available