GERMAN FEDERAL INSTITUTE FOR RISK ASSESSMENT

BfR
Bundesinstitut für Risikobewertung

Use of data from total diet studies in dietary exposure assessments

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Three main criteria of a Total Diet Study at the example of German BfR-MEAL-study

BfR MEAL Study
What's in your food

Criterion 1

- Representative for the (German) population
- Covers 90 % of the German diet
- Includes highly contaminated foods, although they are consumed rarely (< 10 %)

Criterion 2

- Foods are prepared as consumed

Criterion 3

- Similar foods are pooled together to one sample to reduce the number of samples

Value of TDS approach in dietary risk assessment

*"In principle, a TDS should provide the **most accurate** measure of the average amount of a chemical actually ingested through food by the population or population subgroups living in a country."*

*„Calculations of exposure to chemicals based on data from targeted monitoring programs have the potential to be either underestimated, … , or overestimated, ... Testing the product as purchased does not **reflect the impact of further storage, transportation or final preparation of the food**.*
*Ideally, these **exposure estimates should be complemented with results from Total Diet Studies** in which the whole range of consumed food items is **analysed as prepared for consumption**."*


efsa

SCIENTIFIC REPORT OF EFSA

Overview of the procedures currently used at EFSA for the assessment of dietary exposure to different chemical substances

European Food Safety Authority

European Food Safety Authority; Overview of the procedures currently used at EFSA for the assessment of dietary exposure to different chemical substances EFSA Journal 2011;9(12):2490. [33 pp.] doi:10.2903/j.efsa.2011.2490.

Motivating countries to perform Total Diet Studies

*„Some **monitoring or surveillance data focus on** individual chemical **substances in raw commodities** and may not provide a direct link to the dietary exposure assessment of the population.*

*An example is the prescribed testing of grains for the presence of mycotoxins. The grains are further processed and milled to flour and the flour is used as an ingredient in e.g. making bread or producing pasta. **In the absence of analytical data of food as consumed, it is a challenge to estimate the level of mycotoxins in such processed foods** on the basis of the contamination in raw commodity. Thus, dietary exposure could potentially be incorrectly estimated if based on levels that are detected in raw commodities following targeted food monitoring or surveillance activities. **The TDS approach provides a suitable way for countering the uncertainty associated with such processing factors.**"*

„For these reasons countries should ideally conduct food control monitoring as well as TDSs."


efsa
European Food Safety Authority

World Health Organization

EFSA Journal 2011; 9(11):2450

JOINT GUIDANCE OF EFSA, FAO AND WHO

Towards a harmonised Total Diet Study approach: a guidance document

European Food Safety Authority (EFSA), Parma, Italy

Food and Agriculture Organization of the United Nations (FAO), Rome, Italy

World Health Organization (WHO), Geneva, Switzerland

ABSTRACT

A Total Diet Study (TDS) can be a complementary approach to traditional monitoring and surveillance programs, which instead of focusing on compliance is designed to provide a solid basis for calculating population dietary exposure and assessing potential impact on public health. A TDS includes the selection of foods based on food consumption data to represent a large portion of a typical diet, their preparation to food as consumed and the subsequent pooling of related foods before analysis. There is already a wealth of international TDS data available, but to better enable comparisons it is important that methods are harmonised to the extent possible. The Working Group of experts provides a definition of the TDS approach highlighting its inherent value, it gives guidance for a harmonised methodology starting from the TDS planning to the collection of analytical results, exposure assessment calculation and communication of TDS results, and it proposes a general approach to facilitate the use of TDS information at international level. A TDS can be used for screening purposes or as a more refined exposure assessment tool. It provides background contamination and exposure levels of chemical substances as a range of representative foods prepared for consumption, while monitoring and surveillance programs can better capture highly contaminated individual food items. Thus complementarities would allow the identification of the relative importance of individual sources of chemical substances from the whole diet. In conclusion, a TDS is considered to be a good complement to existing food monitoring or surveillance programs to estimate population dietary exposure to beneficial and harmful chemical substances across the entire diet. Harmonising the TDS methodology will enhance the value of these programs by improving the comparability at international level.

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European Food Safety Authority, Food and Agriculture Organization of the United Nations, World Health Organization; Towards a harmonised Total Diet Study approach: a guidance document. EFSA Journal 2011;9(11):2450. [66 pp.] doi:10.2903/j.efsa.2011.2450.

Recent use of TDS data in EFSA opinions

Mycotoxin (various DON congeners) exposure (French TDS)

EFSA CONTAM Panel, 2017. Scientific Opinion on the risks to human and animal health related to the presence of deoxynivalenol and its acetylated and modified forms in food and feed. EFSA Journal 2017;15(9):4718, 345 pp.

Malachite green in fish and seafood (Canadian TDS)

EFSA CONTAM Panel, 2016. Scientific opinion on malachite green in food. EFSA Journal 2016;14(7):4530, 80 pp.

Copper exposure in children (French TDS)

Conclusion regarding the peer review of the pesticide risk assessment of the active substance Copper (I), copper (II) variants namely copper hydroxide, copper oxychloride, tribasic copper sulfate, copper (I) oxide, Bordeaux mixture. EFSA Scientific Report (2008) 187, 1-101

Cobalt exposure in general population (UK TDS)

Scientific Statement of the ANS Panel on the assessment of the safety of cobalt(II) chloride hexahydrate added for nutritional purposes as a source of cobalt in food supplements and the bioavailability of cobalt from this source supporting dossier following a request from the European Commission. The EFSA Journal (2009) 1066, 1-8.

Furan exposure in various age groups (French TDS)

EFSA CONTAM Panel, 2017. Scientific opinion on the risks for public health related to the presence of furan and methylfurans in food. EFSA Journal 2017;15(10):5005,142 pp.

- *Data submitted by Member States: „EFSA sporadically received data from TDS surveys in the past."* *EFSA; Overview of the procedures currently used at EFSA for the assessment of dietary exposure to different chemical substances EFSA Journal 2011;9(12):2490. [33 pp.]*

Summary and Proposal to follow up at EFSA level

- ✓ EFSA has already pointed out the importance of TDS for risk assessment
- ✓ EFSA/ FAO/ WHO has prepared a guidance
- ✓ Methods have been improved and harmonized within Europe by tds▶exposure
- ✓ EFSA has stimulated National TDS at European levels
- ✓ European countries already performed new TDS projects, (e.g.TDS-Exposure pilot studies (CZ, FI, IS, PT, DE), French TDS, Italian TDS, German TDS)
- ✓ No guidance is available on the use of existing TDS data and priorisation of future TDS in Europe

Suggested to launch an EFSA WG on Using Total diet study data in combination with food monitoring for assessing dietary risks and benefits

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Thank you for your attention

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