

Frequently asked questions on the BfR MEAL Study

BfR FAQ, 20 October 2016

For the first time, the BfR MEAL Study (**M**ahlzeiten für die **E**xpositionsschätzung und **A**nalitik von **L**ebensmitteln - "meals for exposure assessment and analysis of foods") investigates the average concentrations of certain substances in food in Germany on a large scale and assesses the potential risks occurring during the processing and preparation of foods. The study covers over 90 percent of all foods in Germany and analyses the meals as they are typically consumed in German households.

The BfR MEAL Study is the first Total Diet Study (TDS) for Germany. Total Diet Studies are currently being conducted in over 50 countries around the world. The Federal Institute for Risk Assessment (BfR) was commissioned by the Federal Ministry of Food and Agriculture (BMEL) to conduct the first TDS for Germany, starting with the preparatory phase in 2015.

Among other things, the results of the BfR MEAL Study will also serve as a basis for the identification of potential risks arising from the consumption of foods. The data can be used to derive recommendations for consumption and also provide an important basis for comparison, allowing the rapid and reliable assessment of levels of undesirable substances occurring in the event of a crisis.

What is a Total Diet Study (TDS)?

A Total Diet Study (TDS) is a method recommended by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) for the determination of the mean levels of substances in the average human diet. The investigated substances include both substances that are beneficial to health and potentially harmful substances. In combination with information from consumption studies that measure the average intake of foods by consumers, the TDS makes it possible to reach a reliable and detailed determination of the average overall intake quantities of substances via foods.

When did the study begin, and how many people are taking part?

The study began in 2015. Scientists, employees involved in documentation, chefs, kitchen staff and buying personnel are all working together in this project. There is also an international scientific advisory board as well as groups of experts for the various substances to be analysed, such as nutrients, pharmacologically active substances, process contaminants etc. Some of the members of the expert groups are also members of the various BfR committees.

What does the study cost, and how is it being financed?

In 2015, funding of just under one million euros was made available for the BfR MEAL Study (total diet study); the budget for 2016 is in the order of 1.8 million euros. The BfR MEAL Study is scheduled to run for seven years. If all those involved in the project are included (BfR, contract laboratories, market research institutes), around 13 million euros will probably be invested in the study over this period. The project is being financed from funds of the Federal Ministry of Food and Agriculture (BMEL) based on a resolution passed by the German Bundestag.

How long will the study run for, and when will the first results be presented?

The study will run until the year 2021. The experimental part of the BfR MEAL Study begins in autumn 2016 and is divided into two phases. The first two years will focus on the basic module, nutrients and mycotoxins, and the first results are expected in early 2019. From

2018, the study will turn to process contaminants, additives and substances migrating from packagings.

Why does the study analyse prepared meals rather than basic products?

The aim of the BfR MEAL Study is to arrive at realistic conclusions regarding the intake of substances via food in Germany. For this purpose, the foods must be analysed in the same condition as they are consumed - as prepared meals. During the preparation of meals, other substances can enter the foods, such as so-called process contaminants (e.g. acrylamide) or additives (flavourings) and can also be destroyed (e.g. vitamins). The simultaneous presence of individual substance groups can also be investigated in the BfR MEAL Study.

Does the study analyse all the substances contained in the meals?

No, it would be impossible to analyse all the substances that are present in meals. Moreover not all substances are relevant for all food groups. For this reason, a list of the substances to be analysed has been drawn up. This list is under discussion and compiled by the expert groups assigned to each module. You can find a link to the substance list at the end of the document.

Which substances are the foods tested for?

In the BfR MEAL Study, foods are analysed for both beneficial and potentially harmful substances. The substance groups include nutrients, additives, pharmacologically active substances, mycotoxins, plant protection products, substances that can enter foods from packagings, and substances that may be formed during the preparation of the meals (process contaminants). In addition, the study will analyse the extent to which average substance levels differ in individual foods depending on region, season or production method (organic or conventional cultivation). You can find a link to the substance list at the end of the document.

Which foods and meals are analysed; what selection criteria were used?

The foods are selected on the basis of existing consumption and concentration studies such as the German National Nutrition Survey II for adults conducted by the Max Rubner Institute, the EsKiMo Study, a representative survey on food intake among children and adolescents conducted by the Robert Koch Institute, the VELS Study (a food consumption survey to determine food intake by infants and small children for the estimation of the acute toxicity risk from pesticide residues) or the KIESEL Study (German food survey for infants, toddlers and children) both conducted by the BfR. This ensures that the foods that are consumed most frequently on average are taken into account, covering more than 90 percent of total consumption. In addition, foods are selected that are consumed less frequently but known to contain high levels of undesirable substances, such as mussels.

What is the difference between consumption studies and concentration studies?

Consumption studies aim at estimating which foods are eaten in which frequencies and amounts. They also survey food knowledge, shopping habits, cooking skills and other data relating to food and diets along with other parameters like height, body weight, physical activity and other demographic and lifestyle factors. Examples of such studies are the KIESEL Study of the BfR and the German National Nutrition Survey II conducted by the Max Rubner Institute. A concentration study, on the other hand, analyses which substances occur in the consumed foods.

How are the meals prepared for the purposes of the study?

The way in which the food is prepared is based on information from the consumption studies. The BfR MEAL Study is supplemented by other surveys on the habits of consumers in which they were also asked about the kitchen utensils they normally use. The German Food Code

and Nutrient Database (BLS) and standard cookbooks (both in print and online) supply additional relevant information on typical methods for preparing meals in Germany. The meals for the study are prepared in a purpose-designed study kitchen.

What is the exact procedure for the study?

The study is divided into six phases. The foods to be analysed are selected in the first phase. These foods are then purchased throughout Germany and prepared in the BfR kitchen. The prepared meals are then pooled, homogenised and analysed. In the final phase, the data are evaluated and the mean intake of substances calculated (exposure assessment). You can find a diagram showing the schedule for the BfR MEAL Study at the end of this document.

Why are foods pooled and homogenised?

The foods are grouped (pooled) in order to determine concentrations and - given the many substances in foods that need to be investigated - to limit the analytical workload in a logical way. This means that multiple samples - for example from different varieties of the food in question, different regions or different production methods - are grouped together to form a representative sample, which is then analysed. This strategy also takes account of different product types and forms of consumption, such as conventional/organic cultivation or peeled/unpeeled, based on their frequency. The prepared meals are then homogenised to ensure that the substances present in the sample are evenly distributed.

It may also be the case that more than one pooled sample is created for a single foodstuff (e.g. apples) in order to obtain a representative sample for each region, season or method of production (conventional/organic).

Where will the results be published?

The findings will not only be incorporated in reports to the Federal Ministry of Food and Agriculture (BMEL) and other partner institutions but will also be published in scientific journals and on the website for the BfR MEAL Study. Moreover, the study data will also be made available to the scientific community in a public use file as well as in a newsletter.

What are the benefits of the study for consumers?

Consumers profit both directly and indirectly from the study. First of all, the study results are used to derive recommendations for the preparation of healthy meals. Moreover, the basic scientific research also benefits the population indirectly: if we know what amounts of certain substances are consumed, then this information can be used to derive recommendations for the political decision-makers - when it comes to such things as adjusting maximum levels, monitoring certain foods more frequently or informing risk groups (children, the elderly, sick people or pregnant women) about risks due to the food they eat. If the average intake level of a substance is known, the health risk of such substances can be determined more effectively - in the event of the sudden occurrence of undesirable substances (food-related crisis), for example.

Are the results of the BfR MEAL Study only valid for Germany?

The BfR MEAL Study is the first Total Diet Study for Germany. It is based on data collected in Germany as well as on existing studies. Accordingly, the results are only valid for the Federal Republic of Germany.

Nevertheless, the study results are comparable with those in other EU countries. This was ensured by a pilot study (TDS Exposure) in which, alongside the BfR, 25 European institutes in 19 EU member states were involved. In TDS Exposure, the institutes agreed on uniform scientific standards that ensure better comparability of the study results.

How common are TDS studies?

In total, more than 50 countries worldwide have conducted a Total Diet Study (TDS) to date. In the European context, the many, regularly updated studies in the UK and the Czech Republic are particularly worthy of mention, as is the study in France which is currently the most in-depth study in terms of methodology. The scientific advisory board for the BfR MEAL Study for Germany also includes consulting representatives from the TDS in the USA as well as from the Total Diet Studies in Canada and New Zealand.

What is exposure assessment?

Exposure assessment determines the average quantity in which consumers ingest a substance or microorganism via food, consumer products or chemicals (in other words, the extent to which they are exposed to the substance in question). The assessment is based, firstly, on data concerning which substances are present in foods or products and in which concentrations. This data is provided for foods by the BfR MEAL Study. In addition, what is also needed are data on the consumption habits for foods and products. These data are supplied by such things as consumption studies (for foods). Based on these two data pools, it is then possible to derive the average intake of substances via foods.

Exposure assessment forms the basis for the assessment of a health risk. Risk assessment considers not only the hazard potential of a substance or microorganism but also the average intake level via food or products. The Federal Institute for Risk Assessment develops new methods for exposure assessment in order to generate reliable data for the required risk assessments. Both standardised, simple screening methods and modern statistical methods are necessary for this purpose.

How does the BfR MEAL Study differ from food monitoring programmes?

Risk-based sampling will make it easier for the food monitoring authorities to successfully track down substance levels that exceed the maximum limit. The food monitoring will also focus on the unprocessed basic products and foods in future. The authorities will concentrate on the foods for which maximum legal limits are stipulated in order to monitor compliance with these limits.

The aim of a TDS, on the other hand, is to cover a broad range of foods and meals, thereby allowing statements on the average level of substances ingested by consumers in prepared meals. The two data sources, the BfR MEAL Study and the food monitoring programme, highlight different aspects of exposure and will be in future also be used by the BfR in its exposure assessments.

What cooperation options are there?

The BfR MEAL Study paves the way for cooperation in various areas. Substance-related topics, hotspots (e.g. regions with high concentration data due to the specific locations), special diets and products, scientific projects, infrastructure and analytics all provide options for potential cooperation. You can find more information in BfR Communication No. 028/2016 listed at the end of the document.

You can find more information at: www.bfr-meal-studie.de (in German)

Provisional substances list for the BfR MEAL Study

<http://www.bfr.bund.de/cm/349/bfr-meal-study-nominated-substances.pdf>

Infographic: BfR MEAL Study: what's in your food

<http://www.bfr.bund.de/cm/349/bfr-meal-study-infographic.pdf>

BfR Communication No. 028/2016: The BfR MEAL Study - Information and Cooperation

<http://www.bfr.bund.de/cm/349/bfr-meal-study-information-and-cooperation.pdf>

Information on the KiESEL Study by the BfR (in German)

<http://www.bfr.bund.de/de/kiesel-studie.html>

Information on the VELS Study by the BfR (in German)

http://www.bfr.bund.de/cm/343/bfr_entwickelt_neues_verzehrsmodell_fuer_kinder.pdf

Information on the EsKiMo Study by the Robert Koch Institute (in German)

http://www.rki.de/DE/Content/Gesundheitsmonitoring/Studien/Kiggs/Basiserhebung/Eskimo/eskimo_node.html

Information on the German National Nutrition Survey II by the Max Rubner Institute (in German)

<https://www.mri.bund.de/de/institute/ernaehrungsverhalten/forschungsprojekte/nvsii/>

Information on the preliminary study "TDS Exposure"

<http://www.tds-exposure.eu/>

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