

The purée truth

How many undesirable substances do we take in with our food? And what impact does preparation have? For the BfR MEAL Study, the BfR cooked, puréed, and analysed.



Not all foods are alike – at least not when it goes into the pot as a complete potato and is then processed into purée. Or when meat fillets are coated in breadcrumbs to create Wiener Schnitzel – in such cases, the original food changes significantly.

NOTHING REMAINS AS IT WAS

Several things happen to food during this transformational process. Its components may react with other ingredients during cooking, frying, or baking. Vitamins may be lost, while some substances that pose a health risk, such as acrylamide, may first arise due to intense heat.

The BfR MEAL Study, conducted by the German Federal Institute for Risk Assessment (BfR) with support from the Federal Ministry of Food and Agriculture, examines such issues. MEAL stands for “Mahlzeiten für die Expositionsschätzung und Analytik von Lebensmitteln” – “meals for exposure assessment and analysis of foods”. Germany’s first Total Diet Study is one of the world’s most comprehensive studies of its

kind and represents over 90% of the population’s dietary habits.

ONE OF EVERYTHING, PLEASE

“For the first time in Germany, we have conducted a systematic and representative analysis of ready-to-eat food,” says Dr Irmela Sarvan, who leads the study. “We prepared 356 foodstuffs and meals as people in Germany usually do.” To achieve this the BfR investigated where the average take-out pizza is bought, which websites are popular for recipes, how much juice or water is in a typical apple spritzer, and how brown fried potatoes are when they land on a plate.

“We bought the food from all over Germany and prepared it in our study kitchen,” says BfR scientist

TOTAL DIET STUDY (TDS)

TDS refers to a method recommended by the United Nations’ Food and Agriculture Organisation (FAO), the World Health Organisation (WHO), and the European Food Safety Authority (EFSA), to identify the average levels of substances in a typical human diet for exposure assessment. Germany’s first Total Diet Study, the BfR MEAL Study, began in 2015.

Dr Mandy Stadion. "This refers not just to cooking, frying or grilling, but also processing steps such as washing an apple or removing the apple core."

The meals were puréed before they entered the laboratory, where scientists investigated the average levels of more than 300 desirable and undesirable substances. Besides additives and substances from the production process (process contaminants), other substances were investigated as well such as nutrients, substances from the environment (environmental contaminants), mycotoxins, plant protection products, veterinary drugs, and substances that can enter food from packaging.

VALUABLE RESULTS

The final report of the BfR MEAL Study highlights key findings, for example for dioxins. Dioxins are undesirable substances from the environment that particularly accumulate in animal fat and can have a negative impact on fertility, as well on the immune and nervous system. "On the whole, the levels of dioxins were low, and often far lower than the maximum permitted levels," Stadion says.

Another substance investigated was methylmercury (MeHg). The organic mercury compound can damage the nervous system and kidneys and cause disorders of the cardiovascular

system. The BfR MEAL Study confirmed that average intake is below the European Food Safety Authority's (EFSA) tolerated weekly intake (TWI) value. "However, 14-to-25-year-olds who eat more than an average amount of fish may exceed the guidance value," says Sarvan, head of the study. "Adults in Germany take in MeHg primarily by consuming Alaska pollock/pollock, as well as tuna, herring, and redfish."

KEEPING AN EYE ON IODINE

The BfR MEAL Study also showed that a large part of the population does not get enough iodine, despite the use of iodine salt in private households and industry. The trace element is essential for metabolic processes, bone formation, and brain development. The BfR MEAL Study identified the highest levels of iodine in salt, algae, cod, and molluscs (for example, mussels). Other good iodine sources include eggs, fish, seafood, meat, and milk, as well as their derived products.

The MEAL data allows recommendations to be drawn up for policy-makers, for example correcting maximum permitted levels, more frequently monitoring certain foods, or making risk groups (children, the elderly, sick or pregnant women) aware of nutritional risks. Overall, the results show that Germany has a very high level of food safety. —

More information



bfr-meal-studie.de/en

The BfR MEAL Study in numbers



149,499

kilometres were travelled while buying the food



4 years & 8 months

is how long the kitchen team spent processing the food into ready-to-eat meals



75 individual ingredients

were bought and processed just to prepare the different recipes for the "Rinderrouladen" (a popular German meat dish) pool.



> 140,000

analysis results were received by the laboratories' study teams.