

# REFOWAS – PATHWAYS TO REDUCE FOOD WASTE

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SUMMARY: REFOWAS is the acronym for “REduce FOod WASTe” and represents an ongoing research project (2015-2018) funded by the German Federal Ministry of Education and Research. “REFOWAS - Pathways to Reduce Food Waste” deals with the topic of avoidable food waste in Germany (<http://refowas.de>).

## 1. INTRODUCTION

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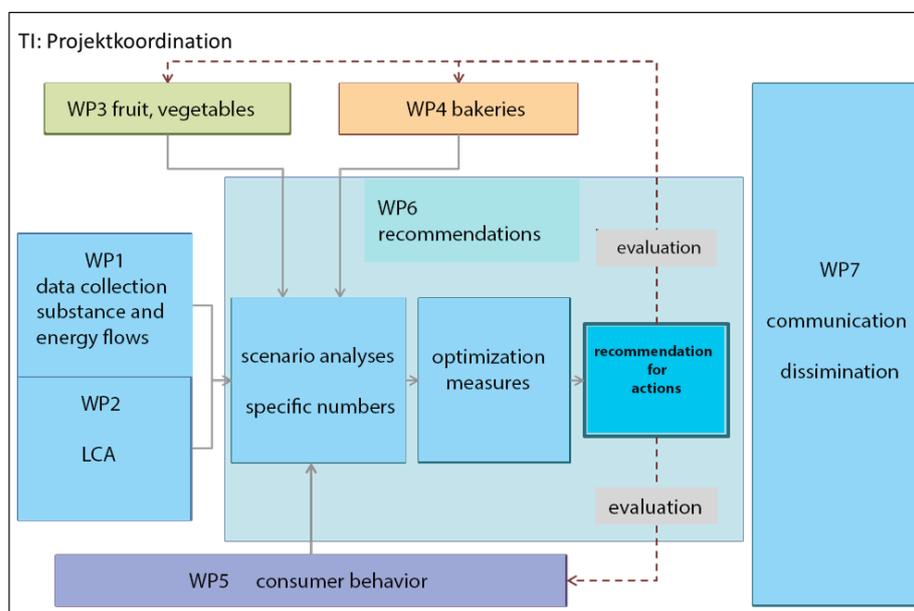


Figure 1: project structure

The project is divided into seven work packages (WP):

WP 1 is designed to provide a representative database for a holistic description and

assessment of the system of food production and use in Germany. Substance and energy flows from the agricultural and nutritional sector are quantified and illustrated on the basis of existing data as well as the results of the case studies and sorting analysis.

In WP 2 the "environmental demand" associated with various foodstuffs / waste is determined by LCA along the value chain.

WP 3-5 covers case studies to investigate special topics in detail. Agricultural production and food waste from fruit and vegetable production is quantified by means of operational and expert surveys (work package 3).

WP 4 deals with food waste during the processing and marketing of bakery products.

WP 5 examines consumer behaviour. Here, on the one hand, the data of the National Nutrition Monitoring (NEMONIT) are used; on the other hand, a case study on food waste in school catering is carried out.

WP 6 merges results from case studies - additionally recommendations for actions are derived.

WP7 is dedicated for dissemination of final results through publications, workshops and information materials.

The production and consumption of food has an impact on the environment. In this context, avoidance of food waste is very important. To analyse this aspect, quantification of food flows in agriculture and along the entire value chain is carried out. Food waste can often be avoided with relative ease what is investigated in detail within case studies.

Within the oral presentation results from all Work packages will be presented and first conclusions will be derived.

project partners:

- University of Stuttgart – Institute for Sanitary Engineering, Water Quality and Solid Waste Management (<http://www.iswa.uni-stuttgart.de/>)
- Thünen-Institute of Rural Studies (<http://www.thuenen.de/en/lr/>)
- Thünen-Institute of Farm Economics (<http://www.thuenen.de/en/bw/>)
- Max Rubner-Institute (<https://www.mri.bund.de/en/home/>)
- Consumer Center in Nordrhein Westfalen (<http://www.verbraucherzentrale.nrw/lebensmittel-ernaehrung>)

## 2. BACKGROUND AND OBJECTIVE

If food waste could be avoided, this would have a significant impact on the reduction of use of resources consumption and emissions. This topic is a public concern for several years meanwhile and becomes increasingly important. Until now there is only little reliable data on the quantities of food waste. For this study it is also important to have information on reasons for the generation of food waste and also regarding which portion of this waste can be avoided through various measures. The goal of the project is to analyse the portion of avoidable waste and to develop strategies and approaches for measures to avoid or reduce waste. Within three case studies – together with bakeries, vegetable and fruit producers and school cafeterias - obstacles and possibilities for action are studied in practice. Next steps are the identification and evaluation of possibilities to develop a new consciousness for sustainable action and to find ways to avoid food waste. Relevant actors are included to elaborate strategies and discuss possible measures.

### 3 APPROACH

Two perspectives are linked by carrying-out a holistic sectoral analysis of the entire food-system and by investigating in detail different food systems in practice within three case studies and the participation of stakeholders. Results and options for action are linked to respective impacts on the entire system. At the same time, specific statements on sub-parts of the system and an evaluation of the relevance of options for action are possible via the participating stakeholders.

In the subsystem „Agricultural Production“ fruit and vegetable crops are analyzed as well as processing and marketing. Regarding processing a detailed investigation of the system “bakeries” is elaborated. In a third case study consumer behavior is investigated to identify different consumer patterns and reasons for the creation of food waste in households. As a further aspect, catering and food waste in schools is included here.

### 4. DATA AND METHODS

The holistic analysis of the agricultural and food sectors is achieved through parallel analyzes by the project partners in the area of environmental accounting, waste statistics and analyses of consumer behavior. Further data stems, amongst other sources, from the German Federal Statistics Office, from national consumption studies and national nutrition monitoring as well as from the literature. The environmental impact along the value chain is calculated on the basis of economic balance approaches.

In the case studies, quantities of food waste are documented and evaluated with the help of the so-called „RESOURCEMANAGER FOOD“ developed at University of Stuttgart. RESOURCEMANAGER FOOD is a hardware software tool for monitoring food waste together with essential additional information (e.g. reasons for food wastage, origin of food wastes etc.). There is also an online-app available for easy access and implementation. In order to identify options for action, different scenarios are analyzed. These options for action are discussed within stakeholder workshops.

### 5. RESULTS

Investigation and analyzes of the entire food system has not only the objective to gain scientific knowledge and policy advice, but also to serve as basis for a raising of public awareness in terms of:

- A quantitative overview of the value chain for food, including food waste and food losses
- Eco-balances with resource requirements and environmental impacts
- Suitable, in part newly developed, methods for the creation and evaluation of options for action
- Approaches for measures to avoid food waste.

Knowledge from system analysis and cooperation with stakeholders within case studies, are used for recommendations and implementations into practice:

- Concepts and options for action to avoid food waste (in the fields of fruit and vegetables, bakery products, school meals and consumer behavior)
- The implementation of a communication and information platform with information materials (brochure, posters, curriculum materials and a resources for school food

providers).

First results and project outcomes will be presented within the oral presentation.