

REFOWAS - reduce food waste

# Approaches to Reducing Food Losses in German Fruit and Vegetable Production

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## 1. Introduction

### The **2030 Agenda for Sustainable Development**

- wants to ensure sustainable consumption and patterns.

Goal 12.3 of this action plan calls for

- halving per capita global food waste at retail and consumption levels and
- **reducing food losses along production and supply chains including post-harvest losses**

by 2030.

(United Nations, 2015, p. 22)

# 1. Introduction

In Germany between 15 and 18 million tonnes of food are disposed as waste every year.

(Kranert et al., 2016, p. 21; Noleppa and Carlsburg, 2015, p. 43)

Although fruits and vegetables are particularly susceptible to food losses due to the rapid perishability detailed information on

- the quantity lost and
- the causes

is lacking an the different stages of the value chain.

## 1. Introduction

The collaborative research project  
**„Pathways to Reduce Food Waste (REFOWAS)\*** aims

- to quantify food losses in the agricultural sector and
- to identify measures to reduce food losses

in order to achieve more sustainable production and consumption patterns in Germany.

This presentation focusses on the

- **case study for selected fruits and vegetables.**

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## 2. Case Study Fruits and Vegetables

### Objectives

- To identify main reasons for food losses occurrence,
- to quantify food losses along the value chains of vegetables and fruits,
- to develop efficient measures to reduce food losses and
- to assess the costs and conditions of implementing these measures.

## 2. Case Study Fruits and Vegetables

➤ Case study

2 products for each value chain (short and long shelf live)

➤ Research objects

Vegetable:       Lettuce  
                          Carrot

Fruit:                Strawberry  
                          Apple

2 important production regions in Germany were examined with partners from regional horticultural advisory service

## 2. Case Study Fruits and Vegetables

### Number of interviews with producers and other actors in the value chain for each case study

2016			Number of producers				Number of other actors in the value chain
Case study	Crop	Shelf live	Lake Constance	Lower Saxony	North Rhine-Westphalia	Rheinland-Pfalz	
Vegetable	Lettuce	short		8	7		5
	Carrot	long		9		11	4
Fruit	Strawberry	short		10	7		2
	Apple	long	5	8			7
General experts for the fruit and vegetable sector							4

## 3. Results

### Definition of food losses

Food losses are the quantity of products suitable for consumption

- that have reached a minimum size and are undamaged
- but are disposed of because of noncompliance with marketing standards or quality demands of the food retail (e. g. because of size, shape, colour)
- or due to fluctuations in demand and price
  - are **not harvested** due to oversupply on markets and too low prices,
  - go into **secondary (non-food) uses** (e. g. animal fodder or biogas),
  - are **spoiled** after harvest.

Products that show a strong rotten or pest level before reaching the minimum size are not considered as food losses.



## 3. Results

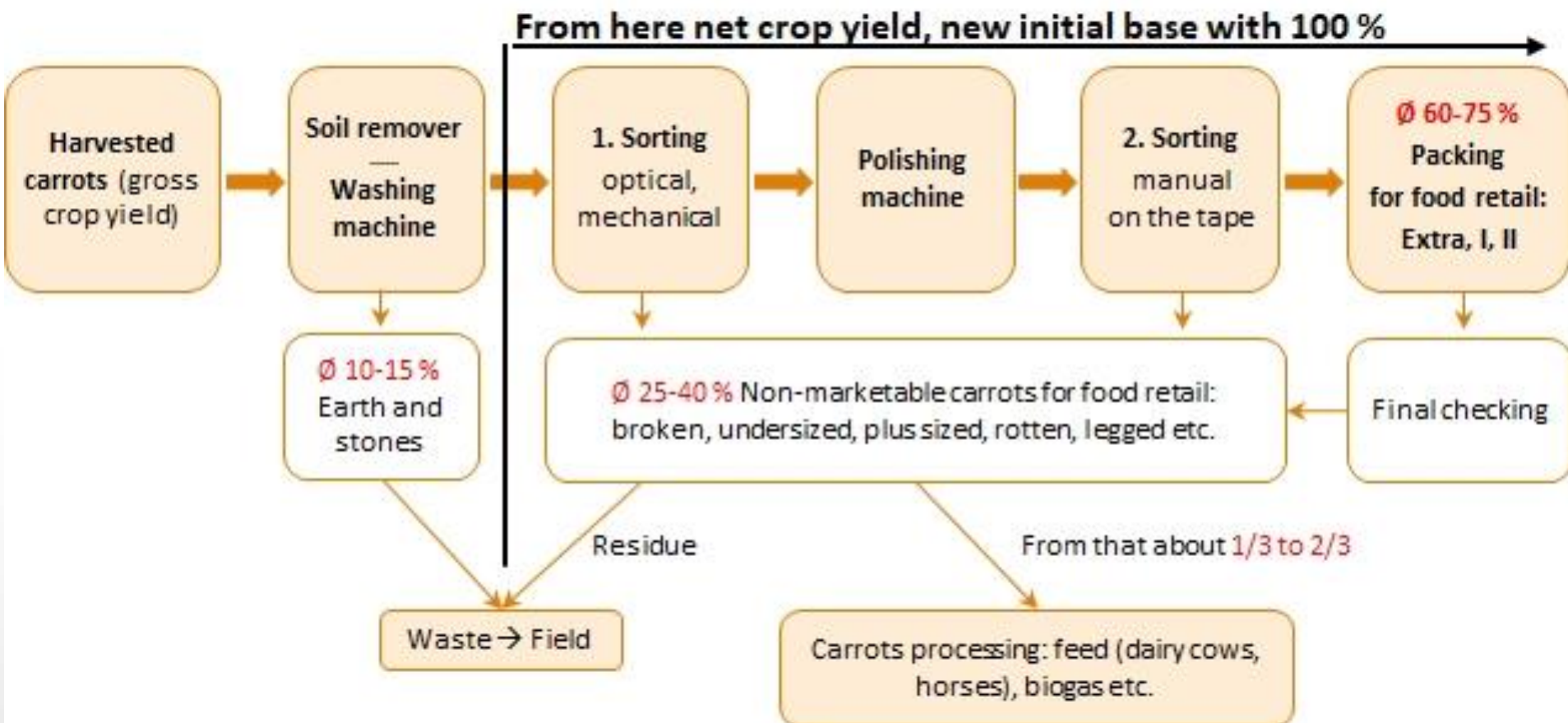
### Harvest rate for lettuce in 2015 (farmer interviews)

	Maximum	Average over all crop batches
Iceberg lettuce	75 - 99 %	68 - 80 %
Organic iceberg lettuce		41 % long-term mean: 60 %
Other lettuce	80 - 95 %	75 - 85 %

- Pre-harvest losses are included.
- Difficult weather conditions in 2015:
  - low night temperatures at the end of June
  - at the beginning of July the temperatures quickly rose to more than 35 °C

## 3. Results

### Estimated losses for leafless carrots



## 3. Results

### Food losses on production level (farmer interviews)

Pre- und post-harvest losses	
Lettuce	15 – 40 %
Carrot	25 – 40 %
Strawberry	5 – 40 %
Apple	5 – 15 %

- Pre-harvest losses are not defined as food losses but could not be separated from post-harvest losses.

## 3. Results

### Causes for food losses on production level

- **Weather conditions**, such as frost, (heavy) rain and hail, can lead to visual defects up to total failures.
- The **market situation** (producer price) has a great influence on the amount of food losses, particularly in the case of lettuce and strawberry with their short shelf life (harvesting, marketing and logistic costs > producer price).
- **Cosmetic specifications** (shape, size, colour) due to the prevailing high quality demands are responsible for food losses.
- **Missing alternative uses** for fruits and vegetables which are consumable but not marketable affect the amount of food losses (e. g. processing options).

## 4. Results

### Potential measures to decrease food losses

#### Production level

- the use of technical progress to extend the shelf life (e. g. ice water or vacuum cooling).

#### Value chain

- Better agreements , e. g.
  - cooperations in production planning,
  - return to the legal framework with respect to the maximum residue levels for pesticides.

(chances of implementation unclear; require further investigations)

## 4. Conclusions

### Food losses at the production level

- Food losses are significant depending on the current conditions (weather, market situation).
- Food losses can greatly vary.

### Potential measures to decrease food losses

- Fruits and vegetables are low-priced products so that the profitability of technical equipment will depend on farm size.
- Efficient measures to reduce the food losses at the production level focus on agreements with the food retail.

## Literature

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