

Food Losses in Fruit and Vegetable Production in Germany – Reasons and Countermeasures

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Introduction

- Food losses occur in all agricultural value chains,
- but are especially high in the fruit and vegetable sector
- due to the rapid perishability.

Nevertheless detailed information on the quantity lost and the reasons for the occurrence of the losses is lacking.

- Therefore this study focusses on the **food losses in fruit and vegetable production** to gain more information and to develop recommendations for policy and value chain actors.

Case Study Fruits and Vegetables

This investigation is part of the collaborative research project **Pathways to REduce FOod WAste (REFOWAS)***

Objectives

- To identify and quantify food losses at farm level and along the value chains of fruits and vegetables,
- to identify main reasons for food losses occurrence and
- to develop and assess countermeasures.

* Funded by the German Ministry of Education and Research

Methodological Approach

Case study

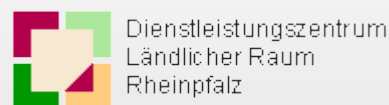
2 crops per value chain (one with long and another with short shelf life each)

2 major production regions for each crop

91 interviews, 8 workshops with interviewees and other experts

Research objects

Crop	Region 1	Region 2
lettuce	Lower Saxony	North Rhine-Westphalia
carrots	Lower Saxony	Rhineland-Palatinate
strawberries	Lower Saxony	North Rhine-Westphalia
apples	Lower Saxony	Lake Constance



Definition of Food Losses

The quantity of products suitable for consumption that is due to **poor quality** or **economic reasons**

- not harvested,
- sorted out during market preparation or
- perished after harvest.

Assumptions

- The product reached a minimum size and
- is undamaged.

Food Losses at Farm Level

		Good years	Average	Bad years
Iceberg lettuce		10 – 15 %	25 – 30 %	35 – 40 %
Leafless carrots		10 – 15 %	25 – 40 %	> 50 %
Strawberries	LS NRW*	5 – 10 % ca. 10 %	15 – 20 %	up to 40 % 40 – 50 %
Apples			6 – 16 %	

Pre-harvest losses are included although they do not belong to food losses by definition.

* LS = Lower Saxony, NRW = North Rhine-Westphalia

Reasons of Food Losses at Farm Level

Weather conditions

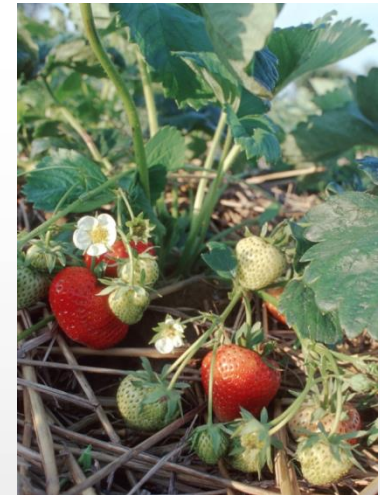
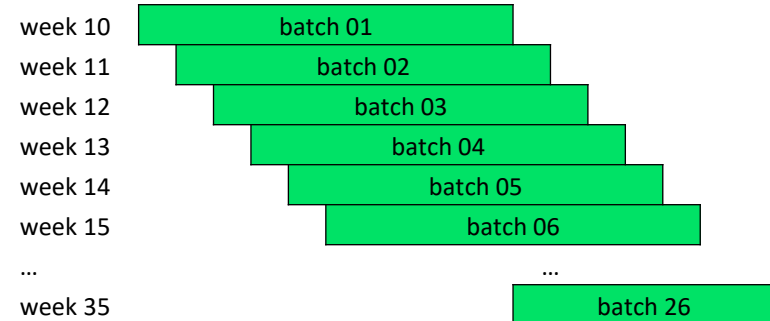
Frost, hail, wind, (heavy) rain, hot weather, drought
→ can lead to **visual damages** up to **total failures**.



Reasons of Food Losses at Farm Level

Market situation

- Lettuce is planted in weekly staggered batches.
 - Strawberries get continuously ripe for harvesting.
- High supply in good weather conditions.
- Reduced demand during holidays or cold weather conditions.



Supply pressure

Producer prices have a major influence on the level of food losses.

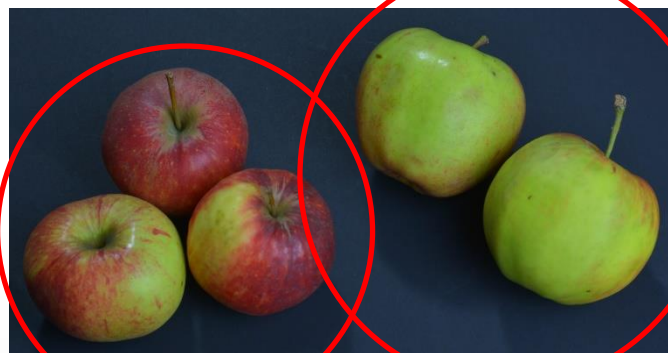
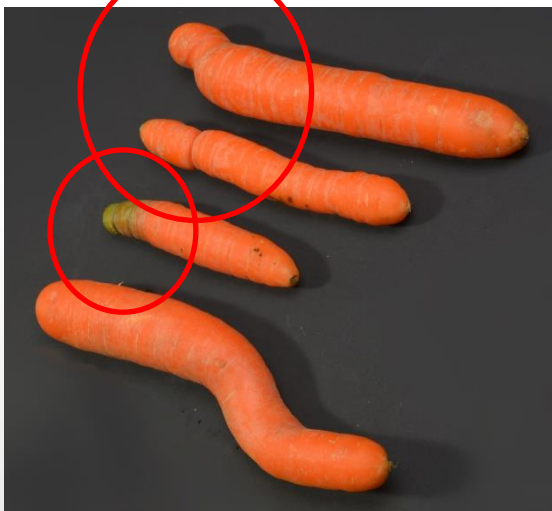
Reasons of Food Losses at Farm Level

High and strict quality standards of the food retail sector

Aesthetic standards, e. g. size or shape,

→ have a strong influence on the **proportion of marketable products**.

misshaped
green heads



insufficient colour

too small

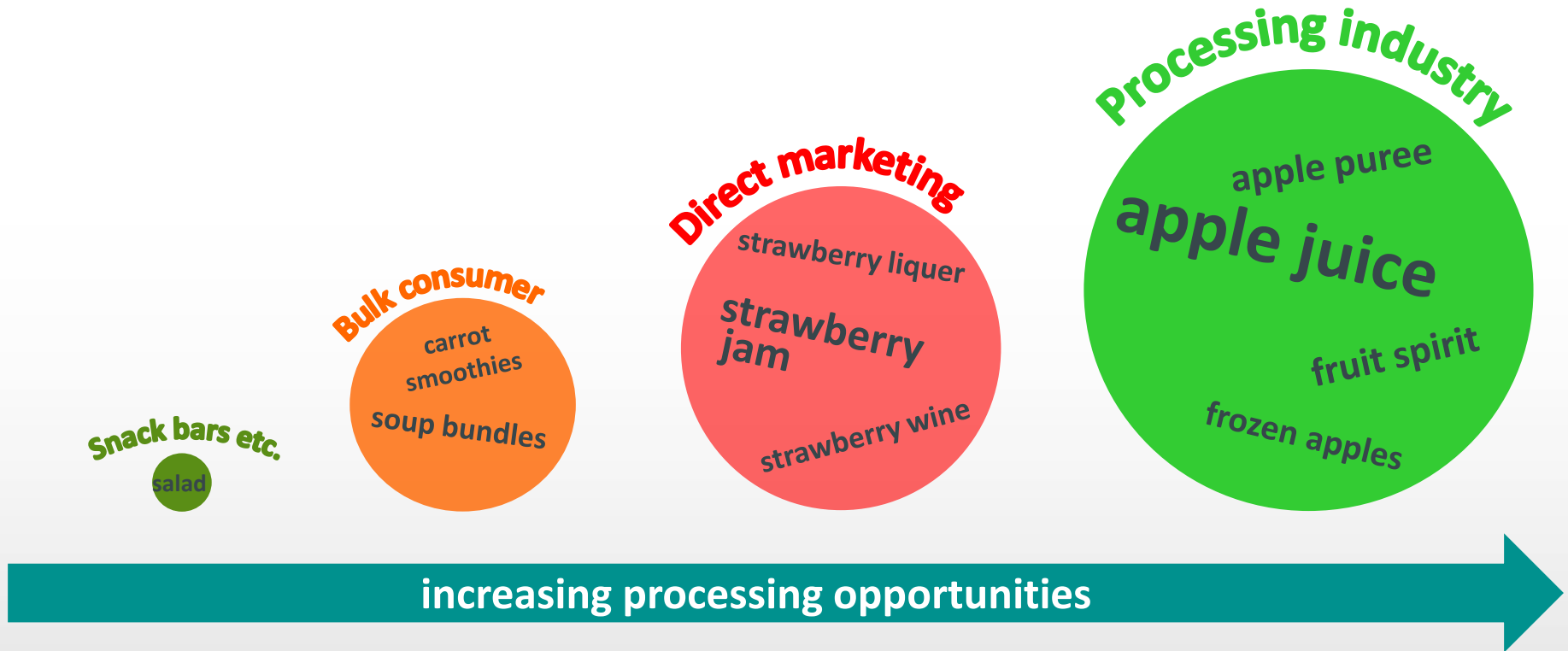


Reasons of Food Losses at Farm Level

Lack of marketing opportunities

Products that do not meet the high quality standards

→ influence the **level of food losses**.



REFOWAS Case Study Fruits and Vegetables

Countermeasures at Farm Level

Technical solutions at farm level

Irrigation, hail protection nets, protected cultivation under glass or foil

Mitigation potential: **++ noticeable quantities achievable**

- (high) investment costs
- lack of consumer acceptance and bad environmental footprint are likely



Countermeasures along the Value Chain

Production

Wholesale

Food retail

Measures to extend the shelf life

- Cooling systems from field to shop counter

Mitigation potential: **+** smaller quantities on farm level,
+++ high quantities in food retail achievable

- Packaging

Mitigation potential: **++** noticeable quantities achievable

- high investment costs and/or additional costs
- environmental impact: energy-intensive or plastic waste



Countermeasures along the Value Chain

Production

Wholesale

Food retail

Qualification of staff

- **Farm level:** management training,
e. g. instruction of seasonal farm workers,
pest control management
- **Retail level:** staff training to gain more specialized knowledge
on professional fruit and vegetable handling

Mitigation potential: **++ noticeable quantities achievable**

– additional costs

Countermeasures along the Value Chain

Production

Wholesale

Food retail

Cooperation along the value chains of fruits and vegetables

- Agreements between farmers and food retail to increase time flexibility in product delivery
- Acceptance of greater tolerances in prevailing high quality standards by food retail regarding size, colour, shape, etc.

Mitigation potential: **+++ high quantities achievable**

– difficult to implement



Conclusions and Outlook

Conclusions

- Food losses can reach significant levels and vary greatly due to the strong influence of weather on production and demand.
- The level of food losses of apples and strawberries are lower than those of carrots and lettuce because there are numerous processing options and alternative market outlets.
- Technical solutions to reduce food losses on production level and along the value chain seem to be too cost-intensive.

Conclusions and Outlook

Outlook

In a subsequent final step of the research **the efficiency of the presented measures** will be assessed by means of identifying

- their avoidance potential,
- their abatement costs, and
- the implications of implementing them.

Thank you for your attention!

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