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# Considerations on food losses in Life Cycle Approach of food supply chain



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# Outline

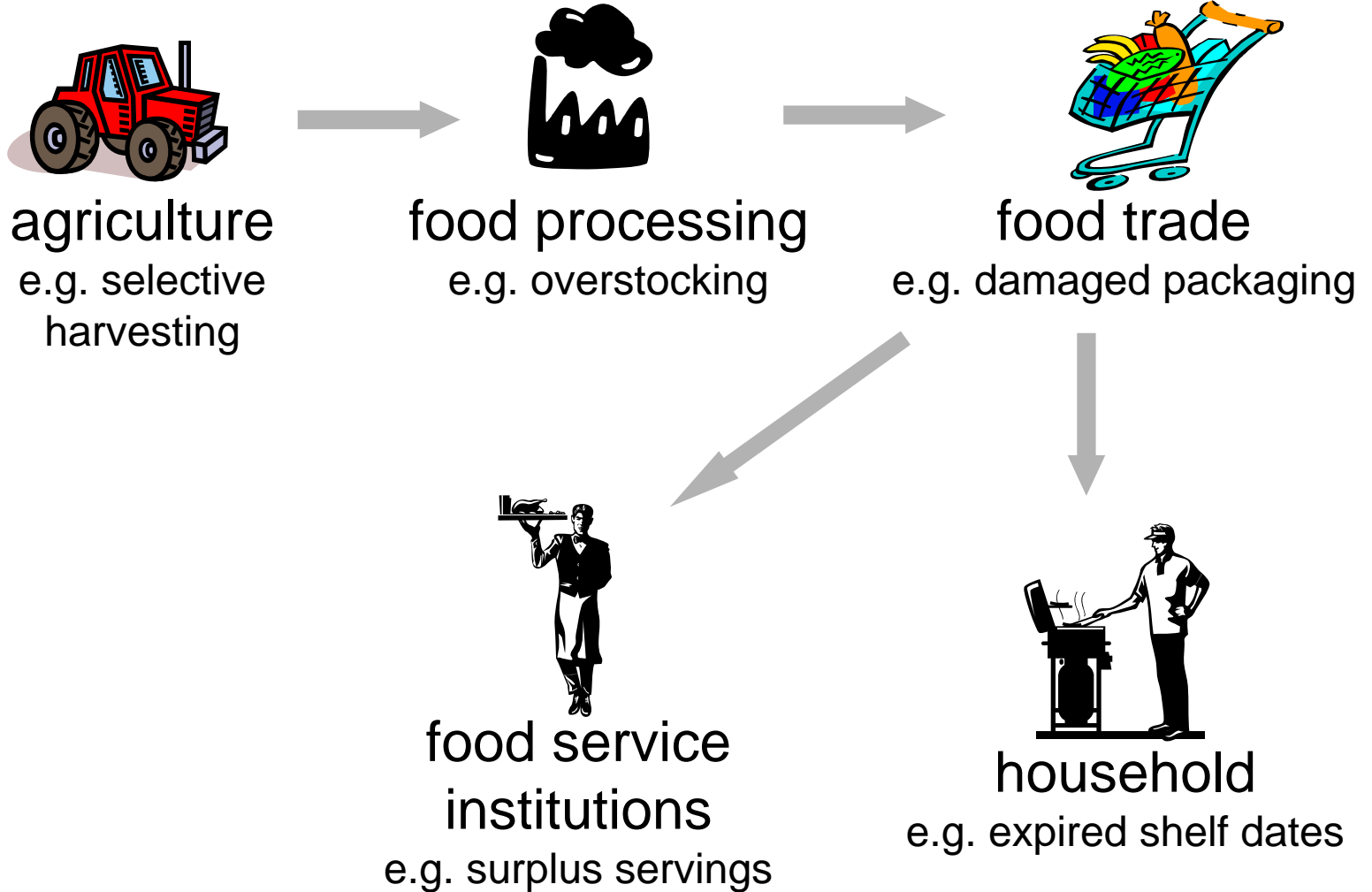
- Introduction
- Methods
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- Example
- Conclusions



# Introduction

- > 700 kg consumption of food per capita and year in Europe
  - food causes several environmental impacts
  - lot of food is wasted along life cycle instead of being eaten
- ⇒ how to deal with food losses within LCA?

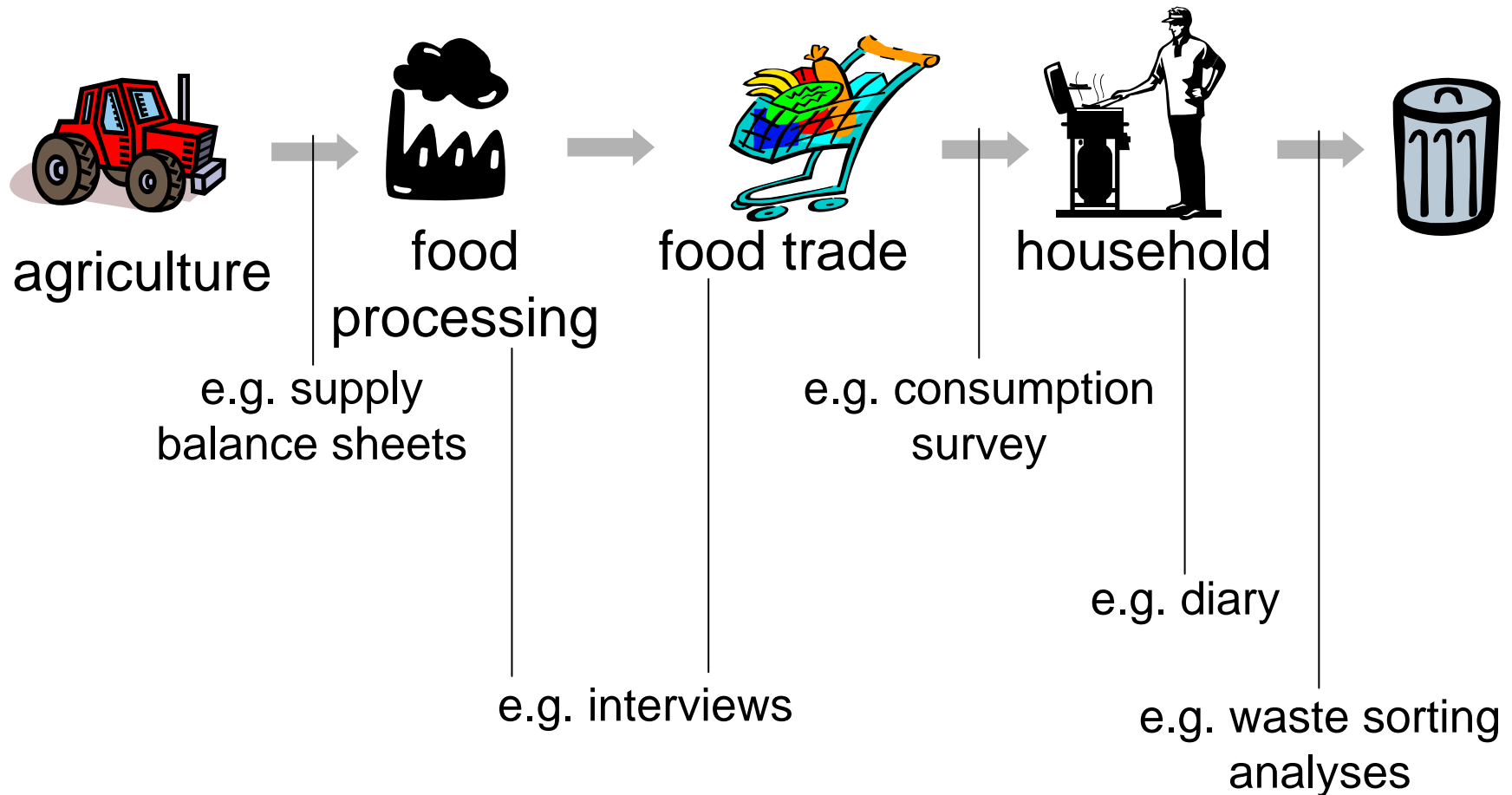
# Food losses



# Food Losses – a worldwide overview

- 27 % of available food in US lost in retail, food service and household (Kantor et al., 1997)
- up to 25 % lost from production to household in Switzerland (Bundesamt für Gesundheit, 1998)
- 4 to 15 % of net national production of vegetables and fruits lost on the way to household in Germany (Von Normann, 2003)

# Methods to estimate food losses



# Problems with considering food losses

- **lack of data base**
  - national statistics do not consider difference between consumption and actual intake
  - rare data for specific products, life cycle stages,...
- **differing bases and units for food losses**

portion of net national production, kilogram per capita, portion of serving mass, portion of residual waste, money per year...
- **complex inquiries to survey food losses**
  - over- respectively underestimation by direct and indirect methods
  - direct methods influenced by behaviour of study participants
  - indirect methods do not consider all options
  - time and money expensive research,...

## Example (Engström, 2004)

- survey in Sweden, 2001
  - two schools (850 to 950 meals/day)
  - two restaurants (250 to 600 meals/day)
  - storage losses, preparation losses, serving losses, leftovers, plate waste
- ⇒ in sum 20 % of the delivered food was wasted (10 % plate waste, 6 % serving losses, leftovers, 4 % storage and preparation losses)

# Example (Engström, 2004)

wasted food category	percent [%]
meat and fish	7 - 20
potatoes, rice and pasta	27 - 50
vegetables	30 - 60

- land needed to produce wasted food: 40,000 ha
- meat needs 91 % from this land although it only represents 20 % maximum of wasted food in food services

# Food losses & LCA

- large losses lead to higher production to receive a given amount of food
- when ignoring, energy and resource demand is underestimated as well as quantity of pollutants
- also small amounts of food losses can have important impact
- food waste is mostly biodegradable causing methane emissions under anaerobic conditions

# Conclusions

- difficult/costly to estimate wasted food
- think about wasted food in LCA
- documentation about consideration or negligence within study
- apart from environment also social and ethical impact of wasted food which can not be easily considered within LCA

# Thank you for your attention!

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