Costs and Effectiveness of Food Waste Prevention and Reduction Strategies

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Overview

• Extent of food waste in Denmark
• Economics of food waste prevention and reduction
• Analytical approach
• Some preliminary results
• A few issues for discussion
Extent of food waste in Denmark
Extent of food waste

*Teuber & Jensen (2016) Food losses and food waste: Extent, underlying drivers and impact assessment of prevention approaches*

- Data sources:
  - Data from study of household waste from Danish EPA
  - Data from study of waste from retail, wholesale and food service
  - Data from facilities receiving industrial waste
  - Literature-based estimates of food loss from agriculture and fisheries
- Compilation of the different data sources
- Estimation of product value at different stages of the supply chain
- Combining quantity and value data to economically assess the extent of food waste in Denmark
Estimated food waste in Denmark

Source: Teuber & Jensen (2016)
Estimated food waste in Denmark

Source: Teuber & Jensen (2016)
Value of food along the supply chain

- Value reflects input of resources entered into the production, processing, transportation, cooling, etc.
- Some correlation with impacts on environment, climate etc.

Source: Teuber & Jensen (2016)
Economics of food waste prevention and reduction
Trade-offs between costs of food waste and costs of preventing food waste

Initiatives to reduce food waste may imply additional costs in terms of ...

• Extra input of resources (personnel, energy, packaging, etc.) to prevent waste
• Lower value of “marginal products” that are otherwise wasted
• Extra supply leads to downward spill-over on commodity prices
• Extra efforts in information, campaigning, data collection, administration...
• Restrictions on consumer choice
• ...

We try to estimate some of these costs
Food waste prevention measures

Food production

- Quality standards (imperfect produce)
- Secondary resellers
- Manufacturing line optimization
- Spoilage prevention packaging

Food service

- Smaller plates
- Trayless dining

Transport, wholesale, retail

- Waste tracking & analytics
- Cold chain management
- Improved inventory management
- Standardized date labelling
- Packaging adjustments

Consumers

- Consumer education campaigns

Source: ReFED (2016), Technical Appendix
Analytical approach
Measures to reduce fruit and vegetable waste – two examples

Secondary reselling
- Establish market for second-grade products to food service production
- Fixed cost to develop market infrastructure
- More products are marketed
- Saved ingredient cost for food service operators

Waste tracking in professional kitchens
- Observed by consultant
- Identify sources of food waste
- Suggest measures
- Fixed cost for consultancy service
- Saved ingredient cost
- Reduced kitchen waste
Some preliminary results
Fruits and Vegetables - VERY PRELIMINARY!

Graph 1: €/kg saved waste vs 1000 tons saved waste

Graph 2: €/kg saved waste for different categories:
- Consumer education
- Waste tracking and analytics
- Staff training
- Quality standards
- Secondary resellers
- Manufacturing line...
- Changed date labelling
- Buffet management
- Inventory management
- Smaller plates
- Changed cooling temperature
Discussion
Discussion

- Large variation in cost-effectiveness of food waste prevention measures
- Depends on food category – and on position in the supply chain
- Relevant data is scarce
  - Food waste data
  - Data on behavioural parameters

- Work in progress - results are preliminary and uncertain!

Thanks for your attention!