

Sustainability assessment of food waste reduction measures

Case study in the food processing and manufacturing sector

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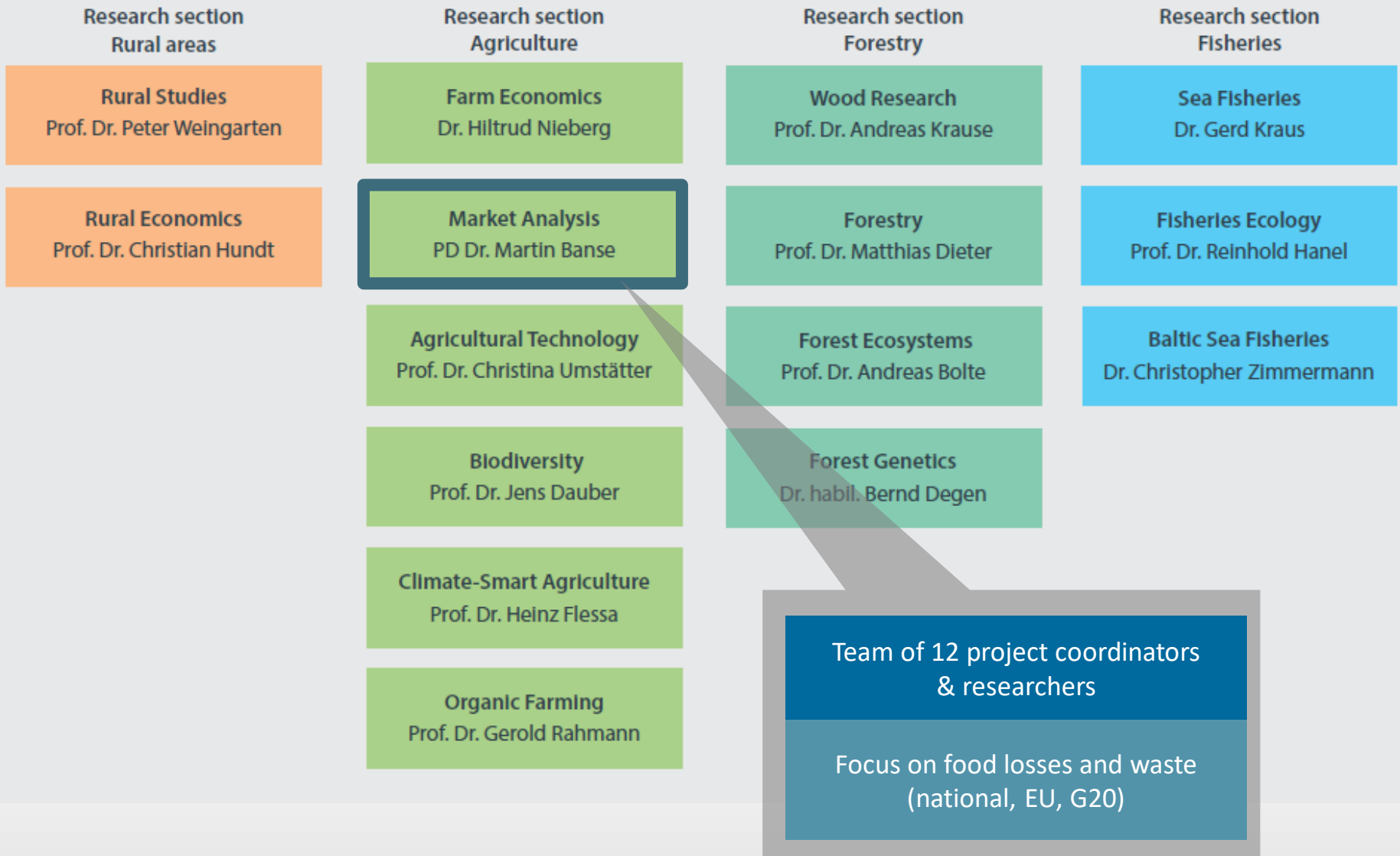


Federal Research Institute for Rural Areas, Forestry and Fisheries

- Under the auspices of the German Federal Ministry of Food and Agriculture
- Tasks: Research and provision of policy advice
- Interdisciplinary profile, 15 Institutes covering in total 19 thematic issues

<https://www.thuenen.de/en/>

Institutes



Wide range of food waste projects along the chain



TODAY'S CASE STUDY

Sectoral Discussion Forum on Manufacturing & Processing

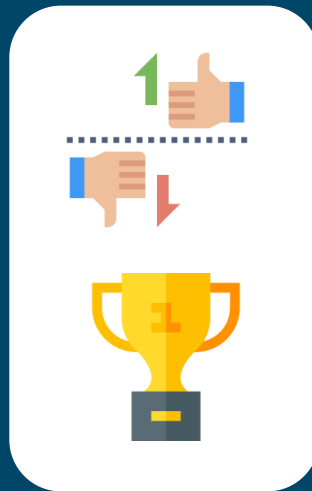
Monitoring of food waste

Sustainability assessments
of food waste reduction measures



Assessing Food Waste (FW) reduction measures

How good are they?



With which measures can we achieve our **goal of reducing FW**

at low cost,

while at the same time providing high ecological and social benefits?



Methodology for assessing FW measures

Based on EU Joint Research Centre methodology

European Commission

JRC TECHNICAL REPORTS

Assessment of food waste prevention actions

Development of an evaluation framework to assess the performance of food waste prevention actions

Carla Caldeira, Valeria De Laurentiis, Serenella Sala

2019

Resources, Conservation & Recycling 161 (2020) 104946

Contents lists available at ScienceDirect

Resources, Conservation & Recycling

journal homepage: www.elsevier.com/locate/resconrec

Full length article

No time to waste: assessing the performance of food waste prevention actions

Valeria De Laurentiis^a, Carla Caldeira^a, Serenella Sala^{a*}

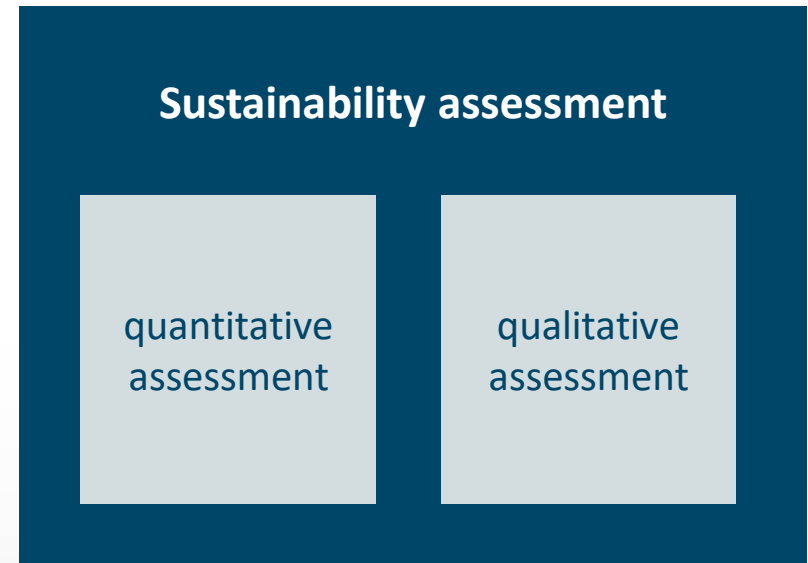
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ABSTRACT

As a result of the growing awareness of the need to prevent food waste, several initiatives have been launched in the last few years to reduce food waste generated across the food supply chain. However, the evaluation of food waste prevention interventions is still at an early stage of development and appropriate methods to assess their effectiveness are missing, hampering the identification of best practices amongst existing initiatives and the prioritisation of those that are most promising. To address such needs and provide a common approach to consistently assess the performance of food waste prevention initiatives, the European Commission Joint Research Centre has developed an evaluation framework for food waste prevention actions. The framework supports the EU Platform on Food Losses and Food Waste, which has been established to identify best practices and share knowledge on food waste prevention initiatives. Additionally, a food waste prevention calculator, based on life cycle thinking, has been developed to support such an evaluation by a consistent assessment of the environmental and economic benefits of such initiatives, and the identification of potential trade-offs at early design stages. The main goal of this paper is to present the evaluation framework and the calculator developed, critically discussing how future initiatives should be designed, monitored and reported, to ensure sufficient and relevant data is made available to enable their proper assessment. Crucially, this would enable practitioners and decision makers to evaluate the success of existing initiatives and give priority to the implementation of the best performing ones.





Quantitative assessment

Beyond the reduction of food loss and waste



EFFECTIVENESS

Aim of our measure

Reduce Food Loss and Waste (FLW)



RESOURCE EFFICIENCY

Ensure sustainability

Business Case
along the 3 dimensions of sustainability

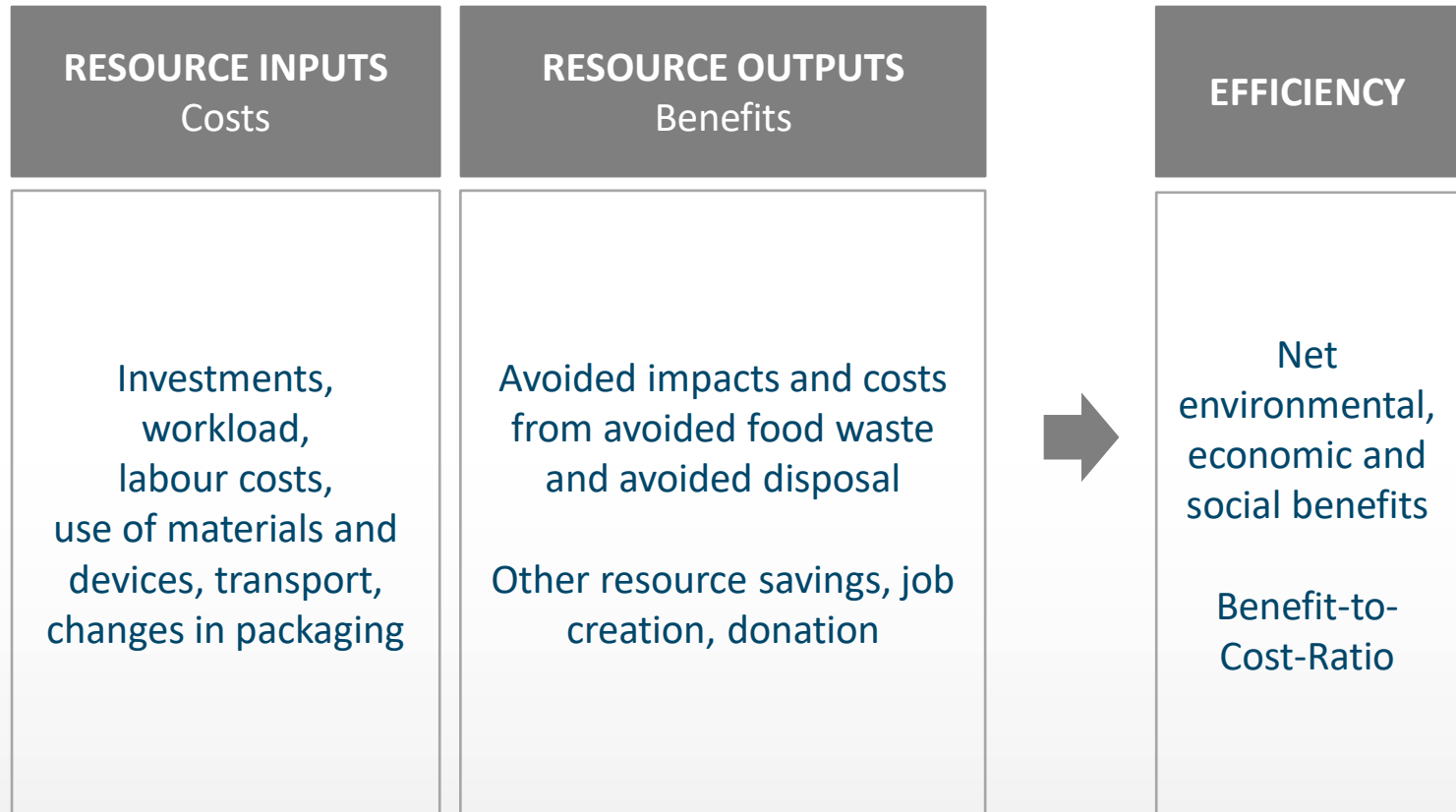


Environment, Economy, Society



Quantitative assessment

Resource efficiency





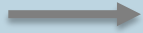
Case study in meat processing company

Rework - reprocessing



Production of sausages:
potential of reprocessing non-conforming sausages

Business-as-usual

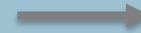
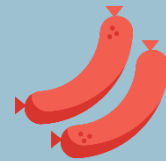


non-conforming
sausages



All non-conforming sausages
are disposed of.

After implementing the FW measure



non-conforming
sausages



peeling
(separator)

Non-conforming sausages
are reprocessed.









Results of the quantitative assessment

Effectiveness and resource efficiency

Experimental data for 2021
(Period: 1 year)

Preliminary findings;
final report to be
published soon.

	Mass	Nutrition	CO ₂ -Footprint	Product Environmental Footprint	Costs	Social
	 KG		 CO ₂			
Net benefits	97	264	3,945	473	136,451	n.q.
	tonnes	million kcal	tonnes CO ₂ Eq.	Pt PEF	EUR	
Benefit-Cost-Ratio (for each EUR invested)	10.8	29,292.7	437.2	0.1	16.1	n.q.
	kg/EUR	kcal/EUR	kg CO ₂ /EUR	Pt PEF/EUR	EUR/EUR	
	EFFECTIVENESS		ENVIRONMENT		ECONOMY	SOCIETY

> 1,200 pigs

Consideration of costs & benefits

- Costs**
- Purchase of separator to peel sausages
 - Energie- & water use separator (incl. cleaning)
 - Labour time for peeling

- Benefits**
- Fewer raw materials to be procured
 - Fewer FW to dispose of

Published reports and papers

▷ Evaluation of FLW measures – Methodology

Goossens Y, Kuntscher M, Lehn F, Schmidt TG, 2021. **Sustainability Assessment of Food Waste Prevention Measures: Thünen Project Brief 2021/22a.** Thünen Institute, Braunschweig, Germany. https://literatur.thuenen.de/digbib_extern/dn063783.pdf

Goossens, Y., Wegner, A., Schmidt, T., 2019. **Sustainability Assessment of Food Waste Prevention Measures: Review of Existing Evaluation Practices.** Front. Sustain. Food Syst. 3, 90, 90:1-90:18. <https://doi.org/10.3389/fsufs.2019.00090>.

▷ Evaluation of FLW measures – Case studies by Thünen Institute

Goossens Y, Leverenz D, Kuntscher M, 2022. **Waste-tracking tools: A business case for more sustainable and resource efficient food services.** Resources, Conservation & Recycling Advances, 15. <https://doi.org/10.1016/j.rcradv.2022.200112>

Goossens, Y., Schmidt, T.G., Kuntscher, M., 2020. **Evaluation of Food Waste Prevention Measures—The Use of Fish Products in the Food Service Sector.** Sustainability 12 (16), 6613. <https://doi.org/10.3390/su12166613>

Leverenz D, Hafner G, Moussawel S, Kranert M, Goossens Y, Schmidt T (2020) **Reducing food waste in hotel kitchens based on self-reported data.** In: Industrial Marketing Management. <https://doi.org/10.1016/j.indmarman.2020.08.008>

Wegner A, Goossens Y, Schmidt T G (2020) **Nachhaltigkeitsbewertung von Maßnahmen zur Vermeidung von Lebensmittelabfällen.** Braunschweig: Johann Heinrich von Thünen-Institut, 73 p, Thünen Working Paper 158, DOI:10.3220/WP1603713219000.

TO BE EXPECTED SOON:

Lehn, F., Schmidt, T. (under review). **Sustainability Assessment of Food Waste Reduction Measures – Converting Surplus Food into High-Quality End-Products.**

Lehn, F., Goossens, Y., Schmidt, T. (under review). **Sustainability Assessment of Food Waste Reduction Measures – Trialing a time-temperature indicator on salmon in HelloFresh meal boxes.**

▷ **More information on our ongoing/past projects on FLW:** <https://www.thuenen.de/en/topics/global-food-and-resources/less-is-more-reducing-food-losses-and-waste>

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