United Against Food Loss and Waste – How to Accelerate the Global Movement

Submitted by: Wageningen University & Research
United Against Food Loss and Waste; How to Accelerate the Global Movement

Toine Timmermans

Taipei, 14 June 2018
Drivers for change
Food waste – latest estimate EU-28

- Equivalent of **20%** of all produced food in EU
- **143** billion euros
- ~ **304 Mt CO2 eq** (6% of total emissions of GHG in EU28%

**143 BILLION EUROS**

For more information on data and quantification, access the March 2016 FUSIONS report: "Estimates of European Food Waste” & "Food Waste Quantification Manual to monitor Food Waste Amounts and Progression”

173 kg pro-capita food waste
FLW PROTOCOL

A multi-stakeholder effort to develop a global

*FLW Accounting and Reporting Standard*
"...reduce food losses along production and supply chains, including post-harvest losses."

"...halve per capita global food waste at the retail and consumer levels."

Overall custodian: FAO

Food Loss Index- focuses on supply

Food Waste Index- focuses on the demand end of the supply chain
CGIAR – CCAFS Program Reducing FLW

- Program in the context of Climate Change Agriculture and Food Security (2016 – 2022)
- 2017/2018 new Public-private Partnerships

Project outcome statement
The project will contribute to understanding the link between FLW reduction and emissions mitigation, drivers for reducing FLW relevant to mitigation and promising interventions and their potential impacts on food, nutrition and emissions. The project will achieve this by setting up initiatives in selected value chains and regions with strong consortia that target the reduction of FLW, including business models and finance, stakeholder incentives, and interventions in the enabling environment.
Modelling climate impacts of measures for food loss reduction

Comparing carbon impacts:
- increase of food supply vs.
- added costs of loss-reducing measures

Increasing cumulative carbon impact per kg product along the chain related to energy, fuel, packaging, etc.
Post-harvest measures for post-harvest food loss reductions

Potential measures

- Redesigning roles and processes in supply chains
- Reduce order lead times
- Create information transparency along supply chains
- Increase fresh product quality management
  handling practices, temperature control, packaging, storage facilities
- Reduce time between harvest and processing
  small-scale (pre)processing near location of production
- Processing of surpluses (shelf-stable products)
  pasteurisation/sterilisation, freezing, drying, fermentation, ...
Dual approach: estimate effects on food security & climate change impacts

<table>
<thead>
<tr>
<th>Food security</th>
<th>Climate change impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example: shelf life extension</td>
<td>Climate change impact of measures:</td>
</tr>
<tr>
<td></td>
<td>• energy</td>
</tr>
<tr>
<td></td>
<td>• packaging</td>
</tr>
<tr>
<td></td>
<td>• ...</td>
</tr>
<tr>
<td></td>
<td>v.s.</td>
</tr>
<tr>
<td></td>
<td>additional production</td>
</tr>
<tr>
<td>Quantitative effect on food</td>
<td>Climate change impact of processing</td>
</tr>
<tr>
<td>losses can be</td>
<td>v.s.</td>
</tr>
<tr>
<td>• measured (protocol)</td>
<td>non-seasonal import or intensified (greenhouse) production</td>
</tr>
<tr>
<td>• estimated (model)</td>
<td></td>
</tr>
<tr>
<td>Example: processing</td>
<td></td>
</tr>
<tr>
<td>Processed surpluses/losses:</td>
<td></td>
</tr>
<tr>
<td>Fill in non-seasonal availability</td>
<td></td>
</tr>
</tbody>
</table>
Challenge (Mozambique)
• collection transport > 48hrs
• postharvest physiological deterioration -> unpalatable and unmarketable for food/feed (destined for bioethanol)

Intended situation with intervention:

<table>
<thead>
<tr>
<th>Raw material</th>
<th>Processing yield</th>
<th>Total yield</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reject raw material</td>
<td>77%</td>
<td>77%</td>
<td>gari</td>
</tr>
<tr>
<td>Village processing</td>
<td>90%</td>
<td>90%</td>
<td>gari</td>
</tr>
<tr>
<td>Mobile factory</td>
<td>98%</td>
<td>98%</td>
<td>Cassava flour</td>
</tr>
<tr>
<td>Central Factory</td>
<td>30% (estimate)</td>
<td>98%</td>
<td>69%</td>
</tr>
</tbody>
</table>

26 partners, 12 countries

Multi stakeholder platforms: the Netherlands, Germany, Spain, Hungary, China
The REFRESH Project

A central ambition of the REFRESH project is to develop a ‘Framework for Action’ model that is based on strategic agreements across all stages of the supply chain (backed by Governments), delivered through collaborative working and supported by evidence-based tools to allow targeted, cost effective interventions.
The REFRESH Project consortium
WP1: Consumer Understanding in Relation to Waste Generation, Handling, Reuse and By Product Valorisation

WP2 Business Engagement – Development of frameworks for action
National working platforms and pilots (Germany, Hungary, Spain, the Netherlands)

WP3: Policy Frameworks for Food Waste Prevention

WP4: Behavioral Economic Approaches and Simulation Scenarios for Food Waste Prevention, Reduction and Valorization

WP5: Environmental Impact & Life Cycle Costing Dimensions of Food Waste

WP6: Valorisation of Waste Streams and Co-Products

WP7: Communication, Impact Oriented Dissemination and Exploitation

Feedback on policy acceptance
Policy scenarios to analyse
Evaluate policy options
Modelled processing chains
Simulation of consumer dynamics
Data input on consumer behaviour
Regulation for valorisation
Acceptance
Pilot learning
Pilot data

6/14/2018 www.eu-refresh.org
REFRESH: impact oriented dissemination

SDG 12.3:
 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses
 EC Circular Economy Package Target = SDG 12.3
 EP Resolution on Food Waste Adopted in Plenary, 16 May 2017
Consumer model

- Ability
- Motivation
- Household practices
- Food waste level
- Opportunity
Policy review and action plan

- **Mapping food waste drivers across the food supply chain**
  - Identifies drivers of food waste and resulting waste streams across the supply chain in five food categories

- **EU policy review**
  - Identifies the impact of EU policy areas on food waste generation and/or prevention and discusses opportunities for improvement

- **Policy workshops**
  - 2 Upcoming workshops in 2018-2019:
    - National approaches and voluntary agreements (19 June 2018, Amsterdam)
    - Consumer behaviour
    - Animal feed
    - Synthesis workshop: implications of REFRESH results for policy

- Propose an **Action Plan** for policy change
Framework for Actions ‘Blueprint’

- Initiation and set up
- Ambition
- Governance and funding
- Establishing actions
- Monitoring and evaluation
Germany

Priorities

- Grocery/retail sector
- Out-of-Home
- Consumer
- Supply chain/ production

Business
- Aldi Nord
- Aldi Sud
- Metro
- Nestle
- Penny
- Sodexo
- Associations (food & retail)

Academic
- Professor Dr. Guido Ritter (FH Munster)

NGOs
- WWF
- Foodsharing
- Consumer organisations
- Die Tafeln

Government / Public Organization
- Federal Ministry of Food and Agriculture
- Environment Ministry NRW
- Bavarian State Ministry for Food, Agriculture and Forestry
- German Council for Sust. Dvlpmt
Hungary

Priorities

- Quantification of food waste
- Supply chain / retail
- Consumer
- Hospitality

Business
- Wholesale Market
- HORECA Marketing Club
- Budapest
- TESCO

Government / Public Organization
- Ministry of Agriculture
- Ministry of Human Resources

Academic
- Agricultural Research Institute

NGOs
- ÉFOSZ (Alliance of Hungarian Food Manufacturers)
Spain

Priorities

- Consumers
- Hospitality
- Primary production

Business

- ACES
- AECOC (GS1)
- ASEDAS
- COAG
- FCAC
- Espigoladors
- Gastrofira
- Mercabarna
- PACKNET

Academic

Government / Public Organization

- Waste Agency of Catalonia
- Metropolitan Area of Barcelona

NGOs

- Barcelona Food Bank
- HISPACOOP
- Plataforma Aprovechemos los Alimentos
- PROSALUS
- Nutrición Sin Fronteras
A multi-stakeholder conference was held in Beijing November 2016 to launch **REFRESH in China**. It attracted **100 participants** from Governments, research institutions, NGOs, public (youth)
减少食物浪费
——行动在中国

发起机构
中国连锁经营协会（CCFA）
中国家用电器研究院（CHEARI）
瑞典环境科学院（IVL）

指导机构
联合国粮食及农业组织
联合国环境署“思前、食后、厉行节约”（Think, Eat, Save）行动

技术支持方
欧盟REFRESH项目
更多机构……

谁在行动

为响应联合国以及中国政府的行动和倡议，我们发起以推动减少食物浪费为目标的伙伴关系平台，旨在搭建一个开放、跨界的交流网络，面向生产端、市场端以及消费端，系统开启减少食物浪费行动，最终以引导公众关注绿色消费习惯与生活方式的转变，参与到减少食物浪费的行动中来。同时，作为联合国“思前、食后、厉行节约”（Think, Eat, Save）活动在中国主要合作机构，参与国际平台交流，分享最佳实践和贡献。

发起机构：

指导机构：

6/14/2018
Netherlands

Priorities

- Actions, solutions & business case development
- Supply chain collaboration & transparency
- Valorisation
- Integrated consumer action

Business
- Albert Heijn
- CBL
- Hutten Catering
- LWM
- McDonalds
- Rabobank
- Unilever
- Protix
- Sligro Food Group
- MVO-NL
- Foodtech Brainport

Academic
- Wageningen University

Government / Public Organization
- Ministry of Agriculture, Nature & Food Quality

NGOs
- Natuur & Milieu
- Youth Food Movement
- Kids University
The Netherlands, Cooperation with industry

- Cooperation between industry (sector organisations) and government since 2009
- Joint agenda on reduction food waste
- 2014 year against food waste
The Netherlands, time for a next step (2016)

- Food waste losses on political and business agenda
- Awareness
- Lots of individual actions (research, campaigns, new business models)
- But: no 20% reduction
- New phase
**WHAT IS THE TASKFORCE?**

Prevention and reduction of food waste is a crucial part of achieving a circular economy. All partners in the Taskforce Circular Economy in Food will collaborate and accelerate to minimize food waste, both across the food chain and by consumers, and to contribute in a transparent manner to this aim.

---

**WHY JOIN FORCES TO COMBAT FOOD WASTE?**

1/3

- A third of the world’s food is lost or wasted every year.¹

- Food waste in Europe causes 6% of all greenhouse gases emitted through human activity.²

Wasting less food = helping to achieve climate goals and ensuring there is enough valuable food for the growing global population.

That is equal to **105 – 152 kg** per capita annually in the Netherlands.³

**The focus of the Taskforce**

The Taskforce focuses on reducing food waste throughout the entire food chain. We will accomplish this by preventing and reducing as much food waste as possible and creating value from side flows according to the “Moerman Food Use Hierarchy”.

---

**OUR OBJECTIVES**

In a joint effort, we aim to make the Netherlands one of the first countries to cut food waste in half. We will make the Netherlands a leader and a global role model in terms of realizing Sustainable Development Goal 12.3.

**2015 - 2030 50% reduction**
The Taskforce acts in four distinct ways:

1. Monitoring progress and impact: The Taskforce measures the effects of its individual and joint approach.

2. Joining forces to combat food waste across the food supply chain: Taskforce members and leaders combine their strengths, networks and knowledge to develop innovative solutions.

3. Joining forces to combat food waste by consumers: The Taskforce aims to achieve sustainable changes in behaviour through campaigns, interventions and living labs.

4. Changing the rules: The Taskforce promotes the legislation and instruments needed to create a circular economy.

Would you like to participate? Join the Taskforce!
Ecosystem for implementation & action
Business pilots on Surplus Food concepts
Ugly fruits and vegetables

KROM KOMMER

IT’S TIME FOR
A NEW DEFINITION OF QUALITY

KROMKOMMER CALLS FOR ABOLITION OF SPECIFIC EUROPEAN MARKETING STANDARDS FOR FRUITS AND VEGETABLES

image 1 skin damage

image 2 color or red stripes
Concept of a Circular Narrative

Circular systems & novel products
Use of food stuff for animal feed

Expert panel on the risk management of using treated surplus food in pig feed (www.eu-refresh.org)

ENVIRONMENTAL IMPACT OF FOOD WASTE RECYCLING

<table>
<thead>
<tr>
<th>Environmental Impact</th>
<th>Pig Feed (wet)</th>
<th>Biogas Compost (wet)</th>
<th>Pig Feed (dry)</th>
<th>Biogas Compost (dry)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damage to the ozone layer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carcinogens</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-carcinogenic toxins eg heavy metals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ionizing radiation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Photochemical oxidant formation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global Warming Potential *</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshwater eutrophication</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marine eutrophication</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terrestrial eutrophication</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eco-toxicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fossil fuel depletion *</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depletion of other non-renewable resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acidification</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Particulate matter emissions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The Global Warming Potential and fossil fuel depletion calculations use the current UK energy mix. If renewable energy were to be used for the processing of the feed, feed would score better on these aspects.
New Business models
Frameworks for action, some systemic aspects

- **Transparency** (Target, Measure, Act), Actions & Monitoring progress
- Supply chain **collaboration** (forecasting, utilisation & circular business models), value chains & **responsibility**
- **Externalities** & balance in economic, ecologic & social-economic impacts
- **Policy coherence** (prevention should come first)
- **Economic & legal frameworks** (food -> feed)
- Commitment for a collective **consumer driven** action program (building on harmonised consumer insights research)
FIGHT FOOD WASTE
Cooperative Research Centre
REDUCE - TRANSFORM - ENGAGE
THE OPPORTUNITY IN AUSTRALIA


AGRICULTURE $ 1.6 billion
POST-HARVEST $ 1.0 billion
PROCESSING $ 1.0 billion
DISTRIBUTION $ 1.7 billion
FOOD SERVICES $ 3.5 billion
HOUSEHOLD $ 10+ billion

CRC Programs

REDUCE
food waste throughout the supply chain

TRANSFORM
unavoidable waste into valuable co-product

ENGAGE
with industry and consumers to deliver change