Review of current EU Member States legislation and policies addressing food waste

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Denmark

A) National strategy on food waste prevention

Denmark has no national plan on food waste prevention. The fight against food waste is partly included in the Resources Strategy "Denmark without waste" that was launched in October 2013 by the Danish Government and is now reflected in the Resource Plan for Waste Management.

It is a strategy to reduce and recycle waste in general.

Over recent decades, Denmark has been incinerating almost 80 % of household waste. Even though this has made an important contribution to green energy production, materials and resources have been lost which could otherwise have been recycled.

The Government has set a goal that in 2022 Denmark will be recycling 50 % of household waste.

By 2018, at least 50% of food waste from households, commercial kitchens, shops and restaurants will be separated and treated biologically, so also energy is utilized.

The Strategy contains no new requirements for individual municipalities. It will still be up to the individual municipality to set the level of service and organisation of waste management.

Types of implications: food waste reduction.

Food supply segments involved/addressed: all.


The Resource Plan for Waste Management sets up a framework for the municipalities within which the municipalities are in the process of developing appropriate source sorting of household waste and the frequency of multi-compartment bin is increasing.

The vision of the Resource Plan is "A Waste Free City", based on the philosophy that there is no such thing as waste; everything is a resource that needs to re-enter the cycle. Thus the overall aim of the plan is “Green Growth and Resources”.

The Resource Strategy and Plan contain an overall target of 50% reduction for recycling of waste from households, but no specific targets on recycling of organic waste.

Types of implications: food waste reduction.

Food supply segments involved/addressed: food preparation and food consumption.

Strategy on growth and resource-efficiency on food is the national strategy on growth and resource-efficiency on food and includes a section on development of new business models limiting food waste, and utilization of excess resources.

Types of implications: food waste reduction.

Food supply segments involved/addressed: all.

B) Market-based instruments

There are no specific national taxes on food waste. Up until now waste (including food waste) management differs from municipality to municipality. Municipalities are primarily responsible for the waste area, especially for household waste. They are responsible for ensuring collection of household waste and for the adequate capacity to treat Danish household waste.

Denmark has two market-based instruments: the Waste Tax was issued in 1987 and promoted by the Danish Government, and the Act no. 311 from 1 April 2011 on tax on waste and raw materials.

The background for the Waste Tax was an acute lack of landfill sites, especially in the greater Copenhagen area, and problems with dioxin emissions from incineration.
The tax was also meant to support the Action Plan for Waste and Recycling. The purpose of the tax is also to increase the proportion of waste managed by techniques towards the top of the waste management hierarchy. The waste disposal tax has been a very important instrument and has lead to significant increase in recycling, as well as a significant decrease in the amount of waste land-filled. Another aim of the tax is to promote incineration over landfill (Nordic Council, 2006).

Initially the rate for landfilling and incineration was the same, but since 1993 it is differentiated (with a higher rate for landfilling). Since 2001 the waste tax has remained at the current rates: DKK 375 (50.5 euros) per tonne of landfilled waste and DKK 330 (44.4 euros) per tonne of incinerated waste. There is no tax on recycled waste.

The Act no. 311 on tax on waste and raw materials was issued in 2011 by the Ministry of Taxation. This Act ensures a tax is applied (quarterly) to anyone who professionally extracts raw materials and to any registered business who produces waste material. For the extraction and import of raw materials listed in Annex 1 and 2, there shall be a tax payment requirement of DKK 5 (about 0.7 euro) for each mq.

The two mentioned taxation acts favours recycling of waste compared to incineration and disposal because recycling of waste is tax free.

Table 1. Denmark’s market–based instrument and related implications on food waste along the food chain

<table>
<thead>
<tr>
<th>Law</th>
<th>Description</th>
<th>Types of implications</th>
<th>Main FSCS involved</th>
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</thead>
<tbody>
<tr>
<td><strong>Waste Tax 1987</strong></td>
<td>The background for the tax was an acute lack of landfill sites, especially in the greater Copenhagen area, and problems with dioxin emissions from incineration. The tax is meant to support the Action Plan for Waste and Recycling. The purpose of the tax is also to increase the proportion of waste managed by techniques towards the top of the waste management hierarchy.</td>
<td>FWR FWM</td>
<td></td>
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<tr>
<td><strong>Taxation of waste and raw materials Act (No. 311 of 2011)</strong></td>
<td>This Act ensures a tax is applied (quarterly) to anyone who professionally extracts raw materials and to any registered business who produces waste material. For the extraction and import of raw materials there shall be a tax payment requirement of DKK 5 (about 0.7 euro) for each mq. Companies processing or importing less than 200 mq. raw materials yearly shall not be subject to payment of any tax.</td>
<td>FWR FWM</td>
<td></td>
</tr>
</tbody>
</table>
C) Regulations and regulatory schemes

Three main regulatory schemes are in place in Denmark.
The Environmental Protection Act N. 698 of September 22, 1998 whose purpose is to contribute to safeguard nature and environment, thus enabling a sustainable social development in respect for human conditions of life and for the conservation of flora and fauna.

It aims at preventing and combating pollution of air, water, soil and subsoil, and nuisances caused by vibration and noise, at reducing the use and wastage of raw materials and other resources, at promoting the use of cleaner technology, and recycling,

The Statutory Order No.48 on Waste of 13 January 2010 specifies the framework for waste incineration, environmental and efficiency report on incineration plant, and regulatory duty of municipalities such as waste management planning and drawing up regulations on fee imposition and waste collection.

The Statutory order no. 1650 from 13 December 2006 on the use of waste in agriculture was launched by the Ministry of Environment.

The statutory order regulates the input quality of food waste delivered for biogas production and composting through limit values on heavy metals and xenobiotic substances.

In addition, a number of European regulations have been adopted and implemented in Denmark mostly by the Ministry of Food, Agriculture and Fisheries. They mainly regard:


Table 2. Denmark’s regulations and related implications on food waste along the food chain

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<td>The objectives of Act are in particular: 1) to prevent and combat pollution of air, water, soil and subsoil, and nuisances caused by vibration and noise, 2) to provide for regulations based on hygienic considerations which are significant to Man and the environment, 3) to reduce the use and wastage of raw materials and other resources, 4) to promote the use of cleaner technology, and 5) to promote recycling and reduce problems in connection with waste disposal</td>
<td>FWR FWM</td>
<td>A1 A2 A3 A4 A5</td>
</tr>
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<td></td>
</tr>
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</table>

D) Voluntary agreements

Charter on Less Avoidable Food Waste
It was signed by 19 partners in June 2011, and later on 19 partners more have agreed to the charter commitment. The charter on less avoidable food waste has now been superseded by a new partnership.
A new Partnership on Less Avoidable Food Waste had its first meeting 27 November 2014 and involves 30 partners from the food value chain from agriculture to consumers.

*Types of implications:* food waste reduction.
*Food supply segments involved/addressed:* all.

E) Technical reports and main scientific articles

Thorsen, AV, Sabinsky M, Trolle E. Food waste in connection to an organic conversion of the food procurement for public kitchens at the Danish Organic Action Plan. The Department of Nutrition, National Food Institute
Published in 2014. Worksite canteens and public kitchens are able to reduce their food waste significantly for example by serving fewer dishes every day but in return diversifying what is offered during the week and by recycling excess food into new dishes. These are some of the findings of this new study conducted by the National Food Institute and the Technical University of Denmark. The Danish Veterinary and Food Administration town hall canteens converted their food procurement to organic food. During the conversion process the total food waste was almost halved in both canteens.
The study showed that the canteen in Roskilde reduced the total food waste by 46% from an average of 74 kilos per day before the conversion to 40.1 kilos after. At the canteen in Fredensborg the daily food waste was reduced by 50%, as food waste dropped from 43.2 kilos per day before to 21.6 kilos after the conversion.
The reduction is in large part due to a drastic decrease in buffet serving waste - that is food that is served e.g. at the buffet but not eaten.

*Types of implications:* food waste reduction.
*Food supply segments involved/addressed:* food preparation and consumption.

Mogensen L., Hermansen J., Tydeman Knudsen M., (2011) Memorandum on "Food waste in food production - from primary production to the retail", University of Aarhus, Faculty of Agricultural Sciences
It defines food waste as food that is ready to be eaten by humans but instead ends up being
thrown out. There is also a ‘hidden food waste’. This is defined as waste of plants or animals, which was planned to be eaten by humans, if they had been handled and used optimally through the whole chain from primary production to retail. Included in this food waste are animals that die due to illness and animals or parts of animals that are rejected at the slaughterhouse due to a health risk for humans. Another example is crop loss in the field due to disease. One of the methods that can be used to lessen the environmental impact from food consumption is obviously to reduce food waste. The report outlines a number of initiatives undertaken in different countries and in different parts of the food chain. An important factor here is that the consumers need to be involved. And information campaigns could be one of the strategies used.

Food waste should not be confused with by-products, which are the secondary products from food production not suitable for human consumption. An example of this type of product is slaughterhouse waste such as bones and non-sterile blood.

**Types of implications:** food waste reduction.

**Food supply segments involved/addressed:** all.

**Concito - Denmark’s green think tank (2011), The Hidden Food Waste Mapping and Recommendations, Copenhagen**
Since January 2011, Denmark’s green think tank, Concito, has worked on identifying possibilities of reducing “the hidden food waste” in the food sector. The project has been completed with the financial support from Promilleafgiftsfonden and the Ministry of Agriculture, Fisheries and Food and in close cooperation with the latter.

This report sums up the existing knowledge about “the hidden food waste” from field to shop to industrial kitchens; partly based on two analyses by the Faculty of Agricultural Sciences at Aarhus University (DJF) and the Institute of Food and Resource Economics at Copenhagen University (FØI) for the Ministry of Agriculture, Fisheries and Food in relation to this project, and partly on the basis of a comprehensive and a very constructive dialogue with key players in the food industry. The report ends up with a list of recommendations containing 18 suggestions on how the players in the food sector and the authorities can contribute to minimize the actual food waste as well as making use of the inevitable food waste in an optimal manner.

**Types of implications:** food waste reduction.

**Food supply segments involved/addressed:** food preparation and consumption.

**TNS Gallup for Stop Wasting Food (2012), Danish consumers and doggy bags, Copenhagen**
It is the first study on what Danish people think about having doggy bags in cafes and restaurants. This study shows that every 2nd Dane would like to have doggy bags in cafes and restaurants in Denmark.

**Types of implications:** food waste reduction.

**Food supply segments involved/addressed:** food preparation and consumption.

**Stop Wasting Food Movement, Danish Agriculture & Food Council (2013), Market analysis on the evolution of food waste in Denmark, Copenhagen.**
Published in 2013 by Stop Wasting Food Movement Denmark and Danish Agriculture & Food Council. This study shows that every 2nd Dane has reduced his/her food waste in the last years. Therefore the Government has a vision that Denmark will protect its resources and materials, and recycle more household waste, while incinerating less. This will entail more materials being sent back into the economic cycle with benefits for the environment.

**Types of implications:** food waste reduction.

**Food supply segments involved/addressed:** food preparation and consumption.
A number of reports and papers have been published only in Danish:

Kjær B., Werge M., (2010), A preliminary survey on avoidable food waste in Denmark from 2010 based on available data, Copenhagen Ressource Institute, Copenhagen.

Food waste is classified in this report as organic waste from the production and preparation of food, discarded food and leftovers. There has been a long-term and extensive discourse on the best way to manage and treat this waste stream; for example, to produce biogas, to compost, or to incinerate with energy recovery. There has, however, been very little focus on how to prevent the initial generation of this waste. A large fraction of the generated food waste is food that is or was edible before being discarded. As such, there is obvious potential to prevent these foods becoming waste and the Danish Environmental Protection Agency is currently considering the launch of initiatives to prevent this type of avoidable food waste. International research indicates that it is possible to prevent a large amount of avoidable food waste from being generated. Avoiding such wastes has the dual benefit of relieving the burden this waste places on the waste management system, and simultaneously means a huge reduction in greenhouse gas emissions by eliminating the initial production of the wasted food. This project aims to create an overview of existing Danish and international research on food waste from different actors within the food lifecycle – from initial food processors to the waste bin – and therefore to identify where the largest potentials lie for prevention of avoidable food waste in Denmark. It also indicates where further research of Danish potential for avoidance is necessary. Furthermore, the project aims to describe Danish legislation concerning food waste and the actions taken to prevent avoidable food waste in Denmark and other countries.

Types of implications: food waste reduction.
Food supply segments involved/addressed: all

Ministry of Environment, (2014), Analysis of domestic waste in Denmark with special focus on avoidable food waste in multi-story houses, Copenhagen.

The total amount of municipal waste in Denmark is 1.1 million tons per year. Of this, food waste is 260,000 tons. Food waste therefore constitutes 24% of the total waste. The average citizen living in the outskirt of a city wastes 0.81 kg of food per week, while a person living in an apartment in the city wastes 1.14 kg of food per week. Besides this, hidden food waste happens and it consists in liquids thrown away in the sink. According to the report such waste is of 1.6 kg per household per week.

Types of implications: food waste reduction.
Food supply segments involved/addressed: food preparation and consumption.

Ministry of Environment, (2014), Analysis of food waste in the service sector, Copenhagen.

The survey shows that the services waste 288,000 tonnes of waste per year, of which 227,000 tonnes is food waste. The annual food waste breaks down into 167,000 tons in the trade sector, 29,000 in hotels and restaurants and 31,000 tonnes in institutions and canteens.

Types of implications: food waste reduction.
Food supply segments involved/addressed: food preparation and consumption.

Ministry of Environment, (2014), A report on the possibilities to reduce avoidable food waste in the retail trades, Copenhagen.

Through interviews with players in the Danish retail market a priority list regarding actions to be done to reduce food waste in the retail industry has been prepared. A list of barriers to reducing food waste, a number of possible technological solutions as well as a flyer for the stores are presented.

Types of implications: food waste reduction.
Food supply segments involved/addressed: wholesale, retail and marketing.
F) Communication and campaigns

Use more - waste less
Launched in 2012 and promoted by the Danish Environmental Protection Agency. The campaign focuses primarily on food waste and gives five tips on how people can reduce their own food waste like: buy the food you need, store the food correctly, only prepare the food that will be eaten, save leftovers and use them later, be aware of use-by labels. The campaign website contains recipes for using leftovers and more information, advice and tips.

Types of implications: food waste reduction.
Food supply segments involved/addressed: food preparation and consumption.

Stop Wasting Food Movement Denmark (Stop Spild Af Mad)
Stop Wasting Food is Denmark’s largest non-profit consumer movement against food waste. Set up by consumers for consumers, Stop Wasting Food is an NGO that has constructively shaped public opinion in its drive to prevent food waste. It seeks to increase public awareness by organizing campaigns, mobilizing the press and media, and encouraging discussion, debate and events of all kinds, all with the aim of decreasing the current mountains of food waste. Stop Wasting Food is empowering the consumers to take action and urges them to launch individual initiatives such as reducing their own food waste, cooking leftovers, shopping more wisely and distributing surplus food to shelters for the homeless people and other charities.

Stop Wasting Food Movement has launched a number of initiatives:
- Stop Food Waste free educational campaign for schools
- What Is Food Waste campaign for consumers
- Waste campaign for consumers
- From Food Waste to Food Help service
- Free Doggy bags for Danish Restaurants
- United Against Food Waste national and international events

United against food waste is an event took place in Copenhagen on the 4th of October 2013, feeding 6.000+ people. In 2014, the United Against Food Waste events were launched in Iceland, Finland, Sweden, Norway and Denmark.

United Against Food Waste’ event is inspired by similar events, for example Feeding the 5000 in London. Nevertheless, it stands out due to of uniting both industry and the consumers.

United Against Food Waste is held under the umbrella of EU-collaboration FUSIONS, which is the world’s largest alliance against food waste. 21 partners from all across Europe participate in FUSIONS, including Feeding the 5000, UN and the Danish consumer movement Stop Wasting Food (Stop Spild Af Mad) and Communiqué. Stop Wasting Food’s international Partners Save Food and Think.Eat.Save are also represented during the event.

Types of implications: food waste reduction.
Food supply segments involved/addressed: all.

REMA 1000 supermarkets
Danish supermarket Rema 1000 has replaced buy-one-get-one-free and other quantity-based discounts with general discounts in all of its stores. Such discounts, frequently implemented by grocery stores to get produce off the shelves, often result in food being wasted at home. Supermarket Rema 1000 exhorts customers to weight vegetables and fruit instead of buying packets of tomatoes or potatoes.

Types of implications: food waste reduction.
Food supply segments involved/addressed: all.
G) Projects and other measures

**Food Waste Think Tank**
It will be launched in 2015 and it will be the new Danish apolitical think tank to gather knowledge and develop action plans to combat food waste. The idea is to create a platform where everyone is welcome irrespective of political or organizational affiliation. The aim is to bring together the extensive knowledge of food waste that exists and to bring stakeholders together to more effectively combat food waste worldwide.

*Types of implications:* food waste reduction.
*Food supply segments involved/addressed:* all.

**Nulskrald AVV municipal initiative to prevent waste and food waste**
The project named “Nulskrald” or “Zero-Waste” aims to collect new knowledge on how people behave in terms of what they do with waste in Denmark. In addition, the project’s ambition is to evaluate possibilities for behavior changes related to shopping, waste sorting and recycling. AVV invited all interested households in Brønderslev and Hjørring municipalities to take part in the project (www.nulskrald.dk). 105 households have signed up for the five-week trial period. During trial period families are asked to reduce their waste outcome as much as possible, sort waste better, compost at home and shop wisely. Participants are called to share their experience, ideas and knowledge via AVV’s Nulskralds (Zero-Waste) Facebook page, Nulskralds (Zero-Waste) website and via mail contact between AVV and families. Zero-Waste project is a collaboration among AVV, Aalborg University, Brønderslev and Hjørring municipalities. Aalborg University supported the project through Solution Hub, which is a learning platform for collaboration between students and external partners.

*Types of implications:* food waste reduction.
*Food supply segments involved/addressed:* all.

**Redfood Label**
Launched in 2014 and promoted by Stop Wasting Food Movement Denmark (Stop Spild Af Mad), Danish Agriculture & Food Council, Unilever Food Solutions, Agro Business Park and DakaReFood. Its aim is to implement a National Label for the Sustainable cafes and restaurants in Denmark. The label will expand to food producers and products in the near future, and it is also planned for the label to become international.

*Types of implications:* food waste reduction.
*Food supply segments involved/addressed:* food preparation and consumption.

**Green Menu Planner**
Green Menu Planner is a new online kitchen tool that combines inspiration, menu planning and ordering. Green Menu Planner addresses both canteens and daycare centers. Green Menu Planner makes precise recipe calculations ensuring that people get exactly the raw materials they need. When you select a recipe, you specify only the number of servings you want to make - and then counting system itself out, how many ingredients you need. It gives you a better overview and less food waste.

*Types of implications:* food waste reduction.
*Food supply segments involved/addressed:* food preparation and consumption.

**Dialogue meetings between the Danish Veterinary and Food Administration and representatives of retail food businesses, non-governmental organizations on food waste and charity organizations**
These meetings focus on the possibilities and barriers of food donation and reduction of food waste in retail in order to target initiatives to significant areas e.g. removing regulatory
barriers to reduction of food waste without compromising food safety or targeted campaigns that create a focus on behavioral change among both businesses and consumers.

*Types of implications*: food waste reduction.

*Food supply segments involved/addressed*: wholesale, retail and marketing.

**Educational material**

The Danish Environmental Protection Agency (EPA) has together with consultants from PlanMiljø and Vestforbrænding developed educational materials for the 4th to 6th grade in public schools. The teaching materials are called Mind the Trash

*Types of implications*: food waste reduction.

*Food supply segments involved/addressed*: food preparation and consumption.

**H) Food waste policy mix: highlights**

Although Denmark has been successful in its waste management planning with its waste incineration policy, it is one of the countries in Europe producing the most waste per habitant, averaging 719 kg of municipal waste per capita in 2011.

The Ministry of the Environment is the government agency in charge of the overall environmental policies and state-level administrative matters relating to the environment. The Environmental Protection Agency under the Ministry is responsible for waste matters and performs supervisory and control functions by setting out the overall framework for waste management. Meanwhile, the municipalities are responsible for the management of waste, such as regulating the collection and treatment of household waste.

Denmark has no national plan for food waste. The Resources Strategy "Denmark without waste " is a general plan that aims to reduce and recycle waste in general. Over recent decades, Denmark has been incinerating almost 80 % of household waste. The Government has now set a goal that in 2022 Denmark will be recycling 50 % of household waste.

The Redfood Label aims to implement a National Label for the Sustainable cafes and restaurants in Denmark. The label will expand to food producers and products in the near future, and it is also planned for the label to become international. There are no specific national taxes on food waste. For now it is different from municipality to municipality what to do with the waste – also food waste.

Municipalities are primarily responsible for the waste area, especially for household waste. They are responsible for ensuring collection of household waste and that there is adequate capacity to treat Danish household waste as well as waste suitable for incineration and landfill arising in the municipality.
In terms of campaigns, Stop Wasting Food is Denmark’s largest non-profit consumer movement against food waste. Set up by consumers for consumers, Stop Wasting Food is an NGO that has constructively shaped public opinion in its drive to prevent food waste. It seeks to increase public awareness of the throwaway society by organizing campaigns, mobilizing the press and media, and encouraging discussion, debate and events of all kinds, all with the aim of decreasing the current mountains of REMA 1000 supermarkets have replaced buy-one-get-one-free and other quantity-based discounts with general discounts in all of its stores. Such discounts, frequently implemented by grocery stores to get produce off the shelves, often result in food being wasted at home. Supermarket Rema 1000 exhorts customers to weight vegetables and fruit instead of buying packets of tomatoes or potatoes. Both the Danish Veterinary and Food Administration and the Danish EPA have launched campaigns to reduce food waste at household level.

In terms of projects and initiatives, Denmark will launch the world’s first Food Waste Think Tank in 2015, a new Danish apolitical think tank to gather knowledge and develop action plans to combat food waste will be launched in 2015. Recently the Nulskrald AVV municipal initiative has been launched to prevent waste and food waste. The project aims to collect new knowledge on how people behave in terms of what they do with waste in Denmark. In addition, the project’s ambition is to evaluate possibilities for behavior changes related to shopping, waste sorting and recycling. 105 households have signed up for the five-week trial period and they were asked to reduce food waste by keeping a diary and monitoring how much food they were wasting. Currently in Denmark one of the greatest barriers for the retail sector to reduce food waste is the “used by date” and “best before”. The labelling is often misunderstood by the consumers and forces the shops to throw away eatable food.

As a consequence, the Veterinary and Food Administration and representatives of retail food businesses, non-governmental organizations on food waste and charity organizations have
organized meetings in order to discuss the possibilities and the barriers of food donation and reduction of food waste in retail.
The overarching goal of the Danish food waste policy-mix is to reduce the amount of food waste which is produced on a whole and to recycle it. Denmark has a well-functioning system ensuring environmentally acceptable handling of all waste types. But the challenge of the future is to exploit resources in waste even better and to reduce environmental impacts.
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Nulskrald AVV municipal initiative to prevent waste and food waste (in Danish) Available from: http://www.nulskrald.dk/

REDOFOOD Label (in Danish) Available from: http://refoodlabel.dk/

Green Menu Planner (in Danish) Available from: http://greenmenuplanner.com/da

Dialogue meetings between the Danish Veterinary and Food Administration and representatives of retail food businesses, non-governmental organizations on food waste and charity organizations Available from: http://www.foedevarestyrelsen.dk/english/Pages/default.aspx

Mind the Trash (in Danish) Available from: http://mindthetrash.dk/%20enhance

All links cited in the references have been accessed for the last time on October 27, 2015.