Module 3, Session 5

Description of slides

Slide 1 - Module 3

Food Service Management

Slide 2 - Session 5

Identification and hierarchy of surplus food management. Ways to manage food waste, food waste recovery options through composting, anaerobic digestion and other recycling techniques.

Slide 3 – Food Waste Hierarchy (part 1)

The food waste hierarchy is a framework that prioritizes actions for managing surplus food and food waste in order of their environmental, economic, and social benefits. It aims to minimise food waste while maximizing its value, promoting sustainability and reducing the environmental impact of waste. The food waste hierarchy emphasizes prevention and recovery before resorting to disposal, ensuring the greatest possible value is extracted from surplus food and minimizing its environmental footprint.

Slide 4 – Food Waste Hierarchy (part 2)

In order to ensure that national efforts against food waste are informed by a solid evidence base and support sharing of innovation and best practice, the EU has been working on augmenting and improving the quantification of food waste levels.
The EU Waste Hierarchy establishes a priority order among waste management actions:
first of all, ‘Prevention’, then ‘Preparing for re-use’, ‘Recycling’, ‘Recovery’ and lastly ‘Disposal’.

Slide 5 – Food Waste Hierarchy (part 3)

The food waste hierarchy looks like an inverted pyramid, as can be seen in the image. Starting from top to bottom we have the following waste management actions:

- Prevention at source: Avoid surplus food generation in the whole food value chain
- Donation or redistribution: Donating surplus food for human consumption or distributing it through food banks or other redistribution organisations
- Animal feed: Using food no longer intended for human consumption as animal feed
- Industrial use: Transforming foo-based material (non-waste) to added-value products for food and non-food purposes (e.g. pharmaceutical, cosmetics)
- Recycling and Nutrient recovery: Transforming food waste in low added-value products such as compost and biogas (with use of nutrients), constructions materials, adhesives, etc.

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- Energy recovery: Biogas (without use of nutrients) or biofuel production from food-waste. Food waste incineration with energy recovery
- Disposal: Food waste incineration without energy recovery. Sending food waste to landfill

Slide 6 – Food Waste Hierarchy (part 4)

Avoid surplus food generation, donation or redistribution, animal feed and industrial use belong to PREVENTION mechanisms and strategies while recycling, recovery and disposal refer to WASTE TREATMENT

Slide 7 – Food Waste Hierarchy (part 5)

The generation of surplus food should be avoided wherever possible, as this represents the most effective strategy for addressing food waste at its source. Prevention mechanisms and strategies focus on minimizing excess food production and ensuring that surplus food is either donated, redistributed, used as animal feed, or repurposed for industrial applications. These actions aim to preserve the value of food and maximize its utility, aligning with the principles of sustainability and resource efficiency

Slide 8 – Food Waste Hierarchy (part 6)

Activities such as recycling, recovery, and disposal are categorized as waste treatment measures. These processes come into play only after food waste has been generated, focusing on managing its environmental impact rather than preventing its occurrence in the first place.

Slide 9 – Food Waste Hierarchy (part 7)

The mentioned approaches form a hierarchy of food waste management, emphasizing prevention as the highest priority and waste treatment as a last resort.

Slide 10 – Key Benefits of Managing Surplus Food

Environmental: Reduces greenhouse gas emissions, conserves water, and limits land use
Economic: Saves money for businesses and individuals by reducing waste
Social: Addresses hunger and food insecurity

Slide 11 – Identification and management of surplus food: best practice example

Last Minute Market is a social enterprise, Spin Off of the University of Bologna, founded in 1998 as a research initiatives. Today, is a entrepreneurial society working

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at Italian national level, developing local projects aimed at the prevention of waste. The objective is the zero waste: all services offered by LMM are studied and designed to prevent and reduce losses and wastage.

Slide 12 – Identification and management of surplus food: best practice example

Identification of Surplus Food at the source such as retailers, supermarkets, manufacturers, and restaurants. Surplus includes unsold food, manufacturing overruns, and unmarketable products. The identification is followed by an assessment: LMM identifies surplus food by working directly with donors and assessing expiration dates, packaging conditions, and safety.

Slide 13 – Identification and management of surplus food: best practice example (part 1)

How LMM applies the Food Waste Hierarchy:
1. Source Reduction: Provides training for businesses to minimize surplus production and optimize stock management.
2. Food Recovery: Redistributes surplus food to local charities and community organizations, helping those in need. Over 10,000 tons of food are recovered annually.
3. Industrial Uses: surplus food not fit for consumption is processed into bioenergy.

Slide 14 – Identification and management of surplus food: best practice example (part 2)

4. Composting: Organic waste is composted to produce agricultural fertilizer.
5.Landfill Avoidance: The initiative ensures almost no surplus food ends up in landfills

Slide 15 – Food Waste Recovery Options

Food waste recovery focuses on extracting value from food waste through **environmentally sustainable methods**. These approaches aim to recycle nutrients and energy from organic material, reducing landfill use and minimizing environmental harm. Key food waste recovery options include composting, anaerobic digestion and other recycling techniques.

Slide 16 – Food Waste Recovery, Composting

Composting is a natural biological process where organic food waste (but also other organic material as for examples leaves) is broken down by microorganisms into nutrient-rich compost or humus, which can be used as a soil conditioner or fertilizer.
There are many benefits of composting:

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- Reduces reliance on chemical fertilizers and pesticides;
- Improves plant growth and promotes higher yields of agricultural crops;
- Improves water quality by filtering stormwater and reducing nutrient and sediment runoff.

Slide 17 – Food Waste Recovery, Anaerobic digestion

The anaerobic digestion is process where microorganisms break down food waste in the absence of oxygen, producing biogas (a renewable energy source) and digestate (a nutrient-rich byproduct for agriculture).
Among the benefits of anaerobic digestion are the following:

- Converts waste into renewable energy
- Reduces reliance on fossil fuels and lowers greenhouse gas emissions

Slide 18 – Food Waste Recovery, Other techniques

Food waste incineration with energy recovery is a waste management approach in which food waste is combusted at high temperatures to produce energy, normally in the form of electricity, heat, or steam. This process is considered a subset of the general waste-to-energy (WTE) processes and one of the value recovery approaches from food wastes that cannot be reused, redistributed, or recycled.
Although this option is considered **less preferable to prevent or recover options** on the food waste hierarchy, it has been a valid **alternative to landfilling**, especially for wastes not easily composted or treated by anaerobic digestion.

Slide 19 – Thank you!

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