The Meat Industry and Climate Change mitigation

The meat industry does not have a very large impact on greenhouse gas emissions as its industrial process is not energy-intensive. However, like many other industries it needs a series of auxiliary processes that do require energy consumption, generating emissions of greenhouse gases, either directly (by the use of fossil fuels) or indirectly (by consuming electricity).

Throughout the meat industry production processes, heat and cold generation are found in various stages and are the main cause of energy consumption in the sector. It is therefore essential to apply efficiency improvements to reduce both indirect and direct emissions of greenhouse gases. In this brochure we will focus on scalding, cooling, tool cleaning, sterilisation, drying and on the refrigeration systems that use hydro-fluorocarbons (HFCs)

A whole set of emissions reduction measures are described below. A distinction is made between energy efficiency measures and direct mitigation measures, as well as between general and specific ones.

Emissions reduction strategies

- Improved energy efficiency for reduced emissions.
  - Orientated towards both direct and indirect emissions.
  - Special attention to the heating and cooling processes, which are the main energy requirements of the meat industry.
- Improvements in refrigeration systems that use hydro-fluorocarbons (HFCs).

Mitigation Alternatives

ENERGY EFFICIENCY

- SCALDING:
  - Measures:
    - Thermal insulation and water control in the scalding tank.
    - Cleaning of the carcass prior to scalding
    - Shower scalding or steam condensation scalding
  - Advantages:
    - Mitigation of heat losses, due to either evaporation or water heat losses
    - Premature dirtying of the water is avoided and thus the heat may be used longer
    - Reduced water consumption and more effective energy use
- REFRIGERATION:
  - Measures:
    - Installation of control systems for closing the cooling chambers to minimise cold losses.
    - Accelerate the cooling process using cold air tunnels for cooling
    - Recovery of heat lost in the cooling plants
    - Implementation of cooling management systems by monitoring the consumption and maintenance of the installations
  - Advantages:
    - Maintenance of the appropriate temperatures and elimination of unnecessary electricity consumption
    - Acceleration of the cooling process
    - Reuse of the heat lost during cooling for use in preheating processes
    - Reduced electricity consumption and improvement in energy efficiency of up to 20%.
- CLEANING OF TOOLS AND INSTALLATIONS:
  - Measures:
    - Automatic hot water temperature control
  - Advantages:
    - Reduction in energy consumption by reducing the demand for heat and pumping of water at excessively high temperatures
- STERILISATION:
  - Measures:
    - Sterilisation of saw by spraying in cabins with hot water nozzles
    - Reduction of the knife sterilisers by means of: insulating and covering them, use of low pressure steam and reduction of water temperature.
  - Advantages:
    - Less water consumption and lower energy required to heat it
    - Optimisation of the sterilisation processes
    - Significant energy saving
- DRYING:
  - Measures:
    - Optimisation of ventilation efficiency by means of filter cleaning, automatic start up, and shut down controls
  - Advantages:
    - Avoids unnecessary energy use in the system

OVERALL EFFICIENCY

- Measures:
  - Avoid the use of more energy than required
  - Optimise the steam generation systems
  - Optimise the compressed air systems
  - Optimise the cold air generation systems
  - Optimise the climatised rooms or chambers
  - Apply low emission production processes and systems
- Advantages:
  - Energy savings and emission levels reduction

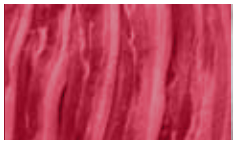
USE OF HYDRO FLUOROCARBONS (HFCS)

- REFRIGERATION:
  - Measures:
    - Improvement in the use and management of chlorinated coolants (HFCs) to prevent leaks
    - Substitute the use of hydro-fluorocarbons (HFCs) coolants for ammonias
  - Advantages:
    - A source of direct emissions into the atmosphere of a gas with a high global warming effect is avoided







Case study: Nalón S.L. (Spain)

(Source: CP-RAC)

Slaughterhouse Company Nalón fridge (Fries, Asturias, Spain), is the meat processing company in Spain and the second in Europe to begin building a biogas generation plant.

The aim is to convert organic waste from the slaughterhouse into high-value products, through which energy is gained, and thus providing an important part of their energy needs.

GENERAL MEASURES TO REDUCE EMISSIONS

The biogas production process comprises the following phases:

- Organic wastes are collected in a tank and an industrial shredder reduces them to particles of between 10 and 20 mm.
- The ground organic waste then goes to a sanitation tank where it is heated to 70 ºC for one hour.
- Subsequently, the material is taken to a softening tank, where the particles are reduced to a size of 4mm, and then pumped to a hydrolysis tank.
- From there it goes to an automatic mixer that sits on top of the digester and mixes the incoming material.
- Finally, in the digester, bacteria in anaerobic conditions decompose organic matter over the course of 25 days.

RESULTS

Generates 80% methane (CH_4) and 20% CO_2. The methane produced can be used as fuel for boilers or as a source of power generation through cogeneration. The carbon released during burning is considered neutral.

Therefore, in addition to being a productive way to use waste, power consumption is reduced as well as emissions. Another product obtained is digested organic matter, whichcan be used as biofertilizer.

The company hopes to be able to process 9,000 tonnes of waste annually and produce 600,000 Nm^3 of biogas with which to obtain up to 1970 MWh of electricity annually.