SECTOR GUIDANCE NOTE: PREVENTING WASTE IN THE FRESH MEAT SUPPLY CHAIN

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The fresh meat sector has been identified as the largest producer of waste arisings in the food and drink industry\(^1\). It accounts for 25% of the waste arisings, significantly ahead of fruit and vegetables at 13%. This represents a considerable financial opportunity for organisations throughout the supply chain.

This sector guidance note presents key results from WRAP research and other information on reducing waste in the fresh meat sector. It is designed to highlight the issues and show the key actions that organisations in the sector’s supply chain can take to prevent waste being produced and save money.

Headlines

- Residual material from animal carcasses that is not sold as meat could be better used for consumption and other purposes to reduce disposal costs and potentially increase sales by around £110 million\(^2\).
- European regulations largely prohibit landfilling as a means of disposing of animal by-products. This means the fresh meat sector must consider alternative methods of dealing with by-products.
- Process improvements using lean manufacturing techniques could help reduce loss and waste in the fresh meat supply chain by between 4% and 5%\(^3\).
- Around 81,000 tonnes of waste packaging are produced each year. Currently this is all landfilled. Potential exists to recycle more of this material and develop solutions that optimise use across the supply chain, potentially extending product life and reducing both weight and disposal costs.
- Effluent charges could be reduced by 5% through better on-site treatment and reducing water consumption.

Key data and research

While consumers spend more money on meat than any other food item, they waste around 570,000 tonnes annually of which 260,000 tonnes (46%) is avoidable and costs about £1.3 million\(^4\).

To quantify waste arisings in the supply chain, WRAP developed ‘resource maps’ that cover chickens, cattle, pigs and sheep (including burgers, sausages, bacon and cooked hams that are derived from them). The maps are designed to highlight waste issues and help the sector improve resource efficiency\(^2\).

An example for poultry is shown in Figure 1\(^2\) (next page).

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1. Waste arisings in the supply of food and drink to households in the UK [www.wrap.org.uk/content/waste-arisings-supply-food-and-drink-uk-households](www.wrap.org.uk/content/waste-arisings-supply-food-and-drink-uk-households)
4. WRAP announced a reduction in total household food and drink waste of 1.1 million tonnes in November 2011 ([www.wrap.org.uk/hhfwwfacts](www.wrap.org.uk/hhfwwfacts)). Avoidable food and drink waste reduced by 950,000 tonnes, and the associated value and environmental impact figures have been updated. Research to update the estimates for individual food and drink categories has not yet been carried out. Therefore, all figures relating to the breakdown of avoidable food waste should be regarded as approximate. However, these remain the best estimates available.
Figure 1 WRAP resource map for poultry

**Imports / Exports**
- Export of live chicks: 6.9m chicks
- Import of live chicks: 0.3m chicks
- Export of whole birds: 0.0155m tonnes (carcass weight)
- Import of whole birds: 0.053m tonnes (carcass weight)
- Export of cuts: 0.235m tonnes (carcass weight)
- Import of cuts: 0.342m tonnes (carcass weight)

**Process**
- UK Broiler growing farms
- Slaughtering and processing 831m birds

**Waste Streams/Resource Impact**
- Cat 1 (tonnes) N/A
- Cat 2 (tonnes) 90,619 tonnes/year
- Cat 3 (tonnes)
  - Feather (tonnes) 102,974 tonnes/year
  - Blood (tonnes) 58,835 tonnes/year
  - General waste (tonnes) 35,194 tonnes/year
  - Cardboard 63 tonnes/year
  - Plastic 616 tonnes/year
  - Wood 40 tonnes/year
  - Paper 8,266 tonnes/year
  - Other 211 tonnes/year
  - Water use 5,655,043 m³/year
  - Effluent 1,884,129 m³/year

**Estimated total Waste in UK**
- Cat 3 27,807 tonnes/year
- Packaging Waste 417 tonnes/year

**Causes of Waste**
- Slaughtering and processing:
  - Death on arrival (Cat 2)
  - Unfit/unhealthy animals (Cat 2)
  - Damage in processing
  - Line stops can lead to scalding (Cat 2)
  - Bad housekeeping (i.e. floor waste)
  - For packaging, mechanical issues with wrapping machine can cause waste.
  - Promotions can lead to packaging waste
  - Returns by customers

- Retail:
  - Weather changes - impact on consumption
  - Forecasting accuracy
  - Promotions
  - Stock rotation policy not adhered to
  - Refrigeration
  - Merchandising standards
  - Quality Control (appearance)

* www.defra.gov.uk/statistics/foodfarm/food/poultry/
Taking action

Preventing product and packaging waste and minimising the use of water need to be given greater profile across the fresh meat sector. EBLEX and BPEX (the organisations representing beef/lamb and pig levy payers) have developed ‘road maps’ to help reduce greenhouse gas emissions produced by livestock, particularly cattle.

The fresh meat sector has an opportunity to minimise all types of waste to reduce costs and benefit the environment. For most processors, accurate measurement of waste arisings is the first step towards more effective management.

The practices on the following pages are designed to prevent waste in the supply chain from field to fork.
1. Increase carcass utilisation

Economic benefits can be obtained by moving residual material up the waste hierarchy (see Figure 2). A great deal of the residual material that is currently being rendered could be diverted into products for humans or pet consumption.

**Figure 2: The waste hierarchy**

Solutions

- Better separation at source. For example, an estimated 200,000 tonnes of residual material from animal carcasses is being rendered unnecessarily. Some of this could attract a lower disposal cost or a financial benefit if a market can be found.
- Abattoirs with low throughputs or in rural locations could benefit from collaborative programmes designed to optimise collection of waste or exploit market opportunities.
- Although widely practised, there is greater potential to utilise the pet food market, particularly dry food, which is an area that has been growing in the UK.
- Develop export opportunities, particularly to the Far East where more exotic cuts of meat are consumed.
- Develop new products using material that currently does not have wide appeal in home markets.

2. Process improvements

Process improvements that reduce waste by using lean production techniques should be more widely applied. Included in this is the development of more dedicated supply chains particularly for cattle and sheep.

EBLEX runs support programmes for beef and sheep farmers, while BPEX provides similar services for pig farmers.

**Solutions**

- Apply efficiency improvements in the cutting and packing lines with better visual reporting, eg charts and the rollout of a programme of total preventive maintenance.
- Align production and sales planning more closely in the supply chain, including order timing and the production of mutually agreed forecasts to reduce discrepancies between actual sales and orders.
- Develop dedicated all-year-round supply chains with known provenance from farm to shelf.
- Rationalise transport arrangements, particularly between the abattoir and the farms supplying animals.

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7. The Lean Enterprise Academy [www.leanuk.org/](www.leanuk.org/)

8. There is a considerable volume of material on preventive maintenance describing the approach and what is involved, a good example can be found at [http://world-class-manufacturing.com/tpm/pm.html](http://world-class-manufacturing.com/tpm/pm.html)
3. Packaging optimisation

Significant amounts of packaging are used in the fresh meat supply chain, particularly intermediate packaging which is used to age meat.

**Solutions**

- Large quantities of plastic vacuum packs that are mildly contaminated with blood are not recycled and pose a major disposal problem that requires the development of an industry-wide solution.
- There is further scope to ‘light-weight’ trays\(^9\) and include more recycled content\(^{10}\). However, a real step change is possible through the greater use of ‘skin packs’ or ‘flow wraps’ for retailing as pictured below, because they reduce packaging weight, extend shelf-life and deliver benefits to eating quality.

\[\text{Tray}\]

\[\text{Skin pack}\]

4. Effluent and water

According to the Environment Agency, water consumption and emissions to water are the most significant environmental impacts of meat processing\(^{11}\). While large volumes of potable water are required to comply with hygiene standards, substantial savings can be made through sub-metering, but this is not widely practised. The majority of meat processing sites do not have on-site effluent treatment facilities.

**Jaspers (Treburley) Ltd: A case study**

Jaspers (Treburley) Ltd in Cornwall introduced an environmental management system that includes two on-site effluent treatment plants. These plants are designed to clean, filter and rid the water of any bacteria, viruses or pathogens. The treated effluent can then be reused on site for washing down external areas such as the lairage, by hauliers and farmers to wash their vehicles, and in the toilet systems. The main saving for the investment is the elimination of discharge costs for the wastewater. Mains water use has also reduced by about 30% with further savings predicted. Together, there is an annual benefit to Jaspers of over £100,000.

**Solutions**

- Sign up to the Federation House Commitment\(^{12}\) – Cranswick and RWM Foods are processors that have already joined.
- Measuring water \(^{13,14}\) use including sub-metering for different plants/processes can result in no- and low cost water reduction measures.
- Conduct water audits to benchmark water usage and effluent generation for different operations.

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10. See this WRAP project that aimed to deliver innovation in the fresh meat sector by developing and trialling packaging concepts to reduce the quantity of waste arisings from chicken portions [www.wrap.org.uk/content/packaging-optimisation-whole-fresh-chicken](www.wrap.org.uk/content/packaging-optimisation-whole-fresh-chicken)


For further information on resource efficiency in the retail sector, please visit www.wrap.org.uk/retail

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