

Dry Ageing of Beef Information Sheet

Written by Rich Summers, March 2025

There are several benefits to dry ageing beef, including tenderisation, intensification of flavour, and preservation. Each is explored below.

1. Tenderisation

After slaughter enzymes known as proteases (that are naturally present in the living tissue) start to break down proteins into smaller constituents that are made up of polypeptides or amino acids. This reaction essentially breaks down and softens coarser muscle fibres and connective tissues (gristle) resulting in a highly desirable softened meat texture that when eaten has reduced bite resistance. In other words it is more tender and has less of a chew!

2. Intensification of flavour

Muscle (which is converted to meat after the completion of rigor mortis) is largely composed of water (approx 75%). During the dry ageing process moisture in the form of water evaporates from the cells of the meat tissues, this reduction of water increases the concentration of protein, essential nutrients and amino acids resulting in a highly desirable, more intense flavour. Essentially meat that is dry aged is to a degree being dehydrated, if you think of the difference in flavour intensity between a fresh tomato and sundried or dehydrated tomato it illustrates nicely that less water = more of an intense flavour. Water loss through meat dehydration results in weight reduction, which increases with the duration of drying.

3. Preservation

Dry ageing of beef also has the potential to extend the shelf life of fresh beef when used in combination with temperature and humidity control, adequate air circulation and ultraviolet light which slow the growth of food spoilage and pathogenic bacteria.

Selecting Meat for the Dry Ageing Process

It is important to note that the correct selection of meat for the dry ageing process is critical to the optimal operation of the dry ageing unit. Animals that are older at the point of slaughter have muscle cells that contain less moisture than younger animals at a point of slaughter. Reduced moisture at the beginning of the dry ageing process will reduce early stage bacterial growth.



Carcasses with a higher fat content will have an overall lower moisture content as fat contains approx between 5 and 8% moisture whereas lean muscle/meat contains approx. 75% moisture, so again there is less moisture at the early stages of the dry ageing process, which reduces early-stage bacterial growth.

I would recommend the following:

- Select meat from older animals with a high fat content
- We advise using meat no more than 7 days of slaughter
- Ensure you use a reputable high-quality supplier/abattoir
- Meat must be of a suitable pH upon receipt pH 5.3 to pH 5.7
- Do not use frozen/defrosted meat
- Avoid vacuum packed or gas flushed or imported meat of questionable provenance.

Avoiding Bacterial Growth

There are certain conditions that encourage bacterial growth, which are important to be aware of so they can be avoided. Consider the following:

Warmth

The optimum temperature range for bacterial growth is between 8 and 63 degrees Celsius, commonly known as the “danger zone”. Therefore the ideal suggested temperature range to dry age beef should be between 1 and 4 degrees Celsius.

Moisture

During the dry ageing process moisture evaporates from the meat cell. The less moisture in the meat cell, the more reduced is the rate of bacterial growth. Reducing and controlling the humidity inside the dry ageing unit during the dry ageing process will reduce the moisture levels. The suggested ideal humidity range should be between 70% and 80% Relative Humidity (R/H).

Food

Food provides nutrients and energy that support bacterial growth. High risk foods that are high in protein such as meat and dairy contain high moisture and nutrients are highly susceptible to rapid bacterial growth. In the case of beef, the leaner the meat, the higher the protein and moisture content, the greater the chance of undesirable bacterial growth.

Time

The longer the period meat spends in ideal conditions for bacterial growth, the greater the faster and greater the growth of food spoilage and pathogenic bacteria will be.

Suitable pH

Optimal bacterial growth occurs at a neutral pH of around 7. Bacterial growth slows greatly and may even stop completely on foods with a high pH of above 7 (alkaline) or with a low pH of below 5 (acidic). Fresh meat upon receipt should have a pH of approx 5.5. In the case of

DFD meat (a condition caused by long term chronic stress of a live animal prior to slaughter) the meat will exhibit a dark appearance with a dry, sometimes sticky texture. DFD meat will carry a higher pH of approx 6.5 making it more suitable to support the growth of bacteria and therefore is highly unsuitable for dry ageing.

Recommended operating of a dry ageing unit

- Temperature range between 1 and 4 degrees Celsius.
- Humidity range between 70% and 80% R/H (Recommend lowering of humidity for a period of between 24 and 48 hrs when introducing fresh meat to an environment containing older ageing meat).
- Rotate meat, fresh meat initially placed on bottom shelves then moved up when replaced.
- Keep UV light switched on at all times (this plays a vital role in the reduction of the development of pathogenic and food spoilage bacteria).

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