Hybu Cig Cymru
Meat Promotion Wales

Extending the shelf life of PGI Welsh Lamb

PGI Welsh Lamb is a respected product with a strong following in the UK and in many export markets. However, reducing waste and accessing distant markets is currently constrained by the relatively limited shelf life that is achieved by the industry. Hybu Cig Cymru – Meat Promotion Wales (HCC) is working with all partners in the supply chain to increase the shelf life achieved by PGI Welsh Lamb with the following aims:

- To increase the competitiveness of PGI Welsh Lamb in export markets
- To achieve more cost effective access to distant markets by seafreight instead of airfreight
- To extend the seasonal availability of PGI Welsh Lamb
- To reduce wastage, caused by spoilage, throughout the supply chain
- To improve the sustainability credentials of PGI Welsh Lamb

New Zealand Lamb is setting the standard with 60+ days shelf life for vacuum packed chilled lamb and up to 110 days for CO_2 gas flushed lamb. This compares with PGI Welsh Lamb generally achieving a shelf life of 14 – 21 days. Successfully achieving a long shelf life depends on having clean and hygienic practices throughout the supply chain and good temperature control once the animal has been slaughtered to keep microbial contamination and subsequent microbial growth to an absolute minimum. While other factors may play a part in influencing shelf life the main focus of this initiative is to reduce microbial contamination. The industry in New Zealand has adopted best practices in the following areas:

- Presentation of clean stock to slaughter
- Good processing plant design
- Carefully monitored hygienic dressing
- Effective moisture and temperature control
- Good vacuum and CO_2 packaging techniques
- Rigorous monitoring of the product throughout the processing and cold chain

Preventing microbial contamination is key to improving shelf life and will require understanding and co-operation by all involved. Sources of microbial contamination include;

- **The animal.** If the animal is presented in a wet, dirty condition there is a high probability that microbes will be transmitted on to the carcase during the dressing process. The outside of the skin and the wool are the most likely sources but care also needs to be taken to avoid faecal contamination and spillage from gut contents.
- **The processing environment**. Contamination can occur either through the meat or carcase coming into contact with dirty surfaces or through bacteria being spread via dust and water.

- **Meat handlers.** Large numbers of microbes can be transferred from the hides and intestinal tract onto meat surfaces. The bacterial load of the meat will increase as it passes from the slaughter room, via the chiller to the boning room as a consequence of contamination from the animal and the personnel handling the meat. Every opportunity for reducing contamination needs to be taken to ensure the product being packaged is as clean as possible.
- **Secondary processing.** When meat is removed from its primary packaging it is further exposed to microbial contamination. The accumulative effect of all the contamination can significantly reduce the display life of packaged meat.

Developing a blueprint for best practice for PGI Welsh Lamb

There are many opportunities within the supply chain to improve practices and contribute to extending shelf life in a manner that adds value rather than cost to the final product. Some of the key areas are discussed here.

Livestock presentation. The condition in which livestock is presented to slaughter has the biggest impact on the potential microbial contamination of the carcase. Wool will harbour bacteria and provide a source for contaminating the carcase. Short wool that is clean and dry will help to reduce the potential for microbial contamination. Crutching and washing animals may well be a necessity to achieve the required standards. An empty gut will also reduce the amount of faecal contamination during transport and in the lairage. Farmers need to understand the importance of withholding food from stock for at least 6 hours prior to travelling to the abattoir. Cleanliness during transport is equally important and training of transport operators will be required to reduce the level of wool contamination during transport.

Processing plant design. Improvements may be needed at several points in the processing plant. Holding yards should be covered to keep animals dry and slatted floors should be used to remove faeces and prevent stock lying in it. Air flows should be monitored and manipulated if necessary so that air flows from clean to dirty areas.

Dressing procedures. A complete review of procedures should be made to identify where contamination could be occurring. Knives and hands should be sterilised regularly and the aim should be to keep hands off the carcase as much as possible. Pelt removal is the obvious danger point for contaminating carcases and equipment should be well maintained and serviced. Vacuum sterilisation could be adopted particularly in the anal area following pelt removal.

The cutting room. The higher the degree of automation within the cutting room the less need there is for process workers to touch carcases thereby reducing the potential for contamination.

Temperature and moisture. Bacterial growth is dependent on moisture and temperature. Washing surfaces risks spreading contamination and cleaning procedures need to be carefully controlled to minimise these risks. The optimum temperature range for lamb is generally accepted to be -1˚C to -1.5˚C and maintaining meat within this range is essential to achieving the maximum shelf life.

The role of the retailer and consumer

Procedures within the cold chain need to be maintained right through to the point of consumption in order to ensure the product meets the expectations of the consumer. Inappropriate retail packaging, overloading of chill display cabinets, incorrect temperatures and lighting conditions can result in a rapid deterioration of the product. While retailers recognise the importance of maintaining the cold chain through to the final point of sale there is probably still scope for improvement. Equally, the consumer needs to know how to store and prepare products correctly to reduce wastage in the home. Food waste has a serious economic impact on businesses and increasing the shelf life of PGI Welsh Lamb will have a positive impact on profits as well as the environment.