

Freshline™ MAP ***– red meat***

Meat holds a prime position in the food supply chain and has long been at the forefront of modified atmosphere packaging (MAP). As long ago as the early 1930s modified atmospheres have been utilised beneficially by the meat industry, when Australian beef was transported to the United Kingdom.





The colour of red meat comes from a pigment called myoglobin, which on exposure to oxygen turns bright red (oxymyoglobin). To the consumer, the brightness of the colour indicates freshness and quality. If the meat is starved of oxygen the pigment turns brown (metamyoglobin), making it unattractive to the consumer and less likely to sell. The colour can be protected by packing meat in high concentrations of oxygen with a balance of carbon dioxide to inhibit microbial spoilage. In this way shelf life extensions of 6-8 days can be achieved. Packaging in a high oxygen environment is particularly important for very red meats such as venison and beef due to the colour intensity.

Other meats which benefit from Freshline oxygen-rich modified atmospheres include lamb, rabbit, veal, goat, hare, horse, wild boar and also offal (e.g. liver, kidneys, and heart).

For primal cuts

Primal cuts are large pieces of meat intended to be cut into smaller pieces for retail sale. At this stage in the distribution chain a bright red colour is not critical so oxygen can be excluded from the packaging atmosphere, in its absence the meat is purple in colour (myoglobin). When the meat is removed from the pack the myoglobin will react with oxygen and turn bright red, upon exposure to air, which is called bloom in the meat trade. Freshline modified atmospheres of 50% CO₂/50% N₂ are often used with the exception of pork, where atmospheres of 80 CO₂/20% N₂ are used.

Bulk master packs

Bulk master packs contain a number of smaller packs ready for retail displays. The use of bulk master packs allows centralised packaging and ensures that products can be stored under optimum conditions during distribution. Since the red colour is not required until display, a Freshline modified atmosphere of 20% CO₂/80% N₂ is typically used for Beef and Lamb, 80% CO₂/20% N₂ for Pork and an atmosphere of 80% O₂/20% CO₂ for venison and wild boar.

Retail packs

For retail display packs the red meat colour and hence oxygen, is very important to maintain consumer appeal. Therefore a high oxygen content is required. A mixture of 70-80% O₂/20-30% CO₂ is usually employed.

With some meats 10% nitrogen is included (balance 70%O₂/20% CO₂) in the modified atmosphere in order to minimise the danger of pack collapse due to carbon dioxide absorption.

Retail packs are usually of the tray and lidding type, produced on ThermoForm-Fill-Seal (TFFS) or Preformed Tray and Lidding (PTLF) machines.

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