

Freshline™ MAP ***– vegetables and salads***

Vegetables and salads begin to show signs of deterioration long before most other foods and are thus prime candidates for the use of modified atmosphere packaging (MAP) gases. When properly cleaned, chilled and placed in suitable packaging, the shelf life of some fresh produce can be extended.





Air Products'
Freshline™

Fruit and vegetables present a unique challenge to modified atmosphere packaging (MAP) since these products continue to respire after packing which results in a shelf life which is inversely proportional to the respiration rate. Principle spoilage mechanisms result from microbial growth, enzymic browning and moisture loss.

Preparation

Only high quality fruit and vegetables should be used for MAP. It is recommended that produce be washed in chilled, chlorinated water, rinsed and then dewatered.

Packaging

If fruit or vegetables are packed in impermeable film then, as they continue to respire, they use available oxygen within the packing. This causes an increase in the proportion of carbon dioxide and leads to anaerobic respiration which causes unpleasant odours, appearance and flavour.

An over permeable film will result in rapid moisture loss and accompanying wilting and shrivelling of the product. A film displaying intermediate permeability is required so that a minimum level of 2-3% oxygen is maintained as the respiring fruit and the permeable film establish a balance between oxygen consumed during respiration and oxygen permeating into the pack.

Packaging for retail is typically in Pillow-Pack or Tray-and-Film-Lidding. Bulk generally utilises a large bag of appropriate permeability.

A natural product of respiration in fresh fruit (especially bananas) is ethylene. Some packaging makes use of ethylene scavengers as this reduces the ageing of produce.

Freshline MAP gases

For most fruit and vegetables a mixture of 5% CO₂ 5% O₂ 90% N₂ provides a good equilibrium modified atmosphere (EMA). For some produce the carbon dioxide and oxygen concentrations can be reduced to 3%. By gas flushing it is possible to establish a beneficial EMA more quickly than a passively generated EMA.

Recent Research has shown that MAP in very high concentrations of oxygen (up to 80%) can lead to significant benefits with some produce.

Storage temperatures

Most fruit and vegetables should be stored at temperatures ranging from 0°C to +3°C. Care should be taken not to let temperatures fall below freezing or irreversible damage can occur. On the other hand certain fruit and vegetables such as whole tropical fruits, bananas, tomatoes and cucumbers should be stored between +10°C and +15°C to prevent chill damage occurring.



tell me more
www.airproducts.com/food
e-mail: mapinfo@airproducts.com

Freshline UK
Air Products PLC
2 Millennium Gate, Westmere Drive
Crewe, Cheshire CW1 6AP
Tel +44(0)1270 614111