MULTIVAC White Paper on Topseal packaging

Shelf life improvement for fruit and vegetables with suitable packaging technology:
The breathing Topseal pack - Xmesh Lidding Net

Preface

On the journey from harvesting to the consumer’s table, fruit and vegetables often cover long stretches. Many companies are involved in the production and logistics chain - from the producer and processor, through the packaging procedure and transport, and finally to the wholesaler and retailer. The delicate food products can be several days on the road - and they are often handled not very gently.

The products are usually packed in film pouches, nets or trays, but they are often sold loose. In the case of film primary packaging, it is mostly MAP or EMAP packs that are used. Plastic or wooden crates are used for reusable transport packaging. Box packaging is a disposable transport solution.

A study by the Fraunhofer Institute for Material Flow and Logistics (IML) and Bonn University shows how important packaging is for product protection. According to this study, around 4.2 percent of box packaging for fruit and vegetables was damaged over the entire logistics chain. A significant cause of this was the inadequate rigidity of the box packs. In the case of reusable plastic transport packaging, the damage rate was only 0.12 percent, and the products arrived practically undamaged - the reason for this being good rigidity and ease of stacking.

But it is not just product protection that is at the forefront. From the producer right through to the consumer, there is a long list of factors, which have to be achieved by the packaging function.

- High quality
- Appetising and fresh appearance
- High level of food safety and protection against microbial spoilage
- Improved shelf life
- Reduced use of additives and preservatives
- Capable of being stacked and stored easily
- Good opportunities for processing
- Retention of vitamins and other important components
- Low packaging weight and of course
- Being environmentally friendly.
Quality and shelf life are a particular focal point. This is because fruit and vegetables are food products, in which metabolic processes continue even after harvesting. The two most important processes in this are respiration and transpiration. In the case of respiration or breathing, the plants absorb oxygen and give this off in the form of carbon dioxide and heat. At the same time, transpiration takes place, whereby the plant gives off water vapour through its pores. They ultimately ripen, ferment and discolor - and the consequences are finally spoilage due to decay of the cellular structure, as well as the growth of mould and other undesirable microorganisms.

Optimised packaging, which is matched to the relevant product, ripening process and logistics structure, offers a wide variety of benefits - including ecological aspects. Packaging helps to improve the utilisation rate of cultivated food products and therefore to reduce food wastage. In addition to this, packaging eliminates direct contact with many hands, and it also prevents damage during handling as well as offering space for labels and other important consumer information.

The breathing Topseal pack

A new type of pack for fruit and vegetables in the Topseal sector, which uses an open net film, is enjoying increasing popularity. Its great benefit is its low material consumption and the enclosed packaging, which is impervious to contact. The process has primarily been used up to now for food such as potatoes, which are very robust by their nature. Recently however, it has been used increasingly for other types of fruit and vegetables as well as herbs. In addition to MAP and EMAP packs, Topseal packaging represents an ideal opportunity to significantly improve the shelf life of products, particularly those that require a high degree of air exchange. Thanks to XMesh Lidding Net, which has been patented in many countries, those fruit and vegetable varieties, which by their nature have a high content of water and acid, can be packed in such a way, that the high level of residual moisture can escape from the pack. The control of the moisture has a very positive effect on these products as regards their taste, appearance and above all their shelf life.

Thanks to Topseal packaging, the product remains cool and retains its freshness. Spoilage through mould growth is prevented or at least delayed significantly. The shelf life is guaranteed for several days, as long as the chill chain is not broken and the right temperature for the product can be maintained during transport and storage.

Another positive effect of Topseal packs is the good visibility of the product. Since consumers like to open food packs prior to purchase to inspect the content visually and touch it, the transparency of the materials plays an increasingly important role. XMesh Lidding Net is therefore offered as standard in a transparent version. There are also however coloured variants available, which contribute to enhancement or improvement of the presentation at the point of sale. The material is certified and meets the most stringent legal requirements for materials in direct contact with food.
Packs sealed with XMesh Lidding Net can be used in a wide range of applications and also offer other benefits:

- They offer a high level of resistance thanks to their net structure. This means that they withstand even robust handling virtually undamaged.
- Thanks to patented sealing with a special seal edge, the packs are tightly sealed and can not be opened quickly or easily by the consumer prior to purchase.
- They are easy to stack - even the most delicate types of fruit such as grapes or physalis remain well protected in the pack.
- Despite their rigidity, Topseal packs are lighter than traditional packs, because thinner materials are used. This saves costs both in packaging and transport.
- Thanks to the use of mono material, Topseal packs are sustainable and environmentally friendly.
- Due to their ease of use on machines and their sealing properties, they can be run without problems on thermoforming packaging machines and traysealers.
- The flat structure of the material ensures that labels adhere well and remain on the pack throughout the entire logistics chain.

To produce these packs, MULTIVAC offers a wide range of thermoforming packaging machines and traysealers, which can be designed to the specific needs of the customer, as well as producing very high-quality Topseal packs and guaranteeing an efficient and economical packaging procedure. There is also a wide range of certified materials available for all requirements.