

# Safely packed

THE EFFECTS OF MAP PACKAGING ON BAKED GOODS WERE EXAMINED IN A DEGREE DISSERTATION AT THE UNIVERSITY OF APPLIED SCIENCES

**+** Prolonged quality and less spoilage of fine bakery wares are features demanded by consumers and manufacturers alike. To the manufacturers, longer shelf life also means cost savings and higher flexibility and efficiency in production, storage and logistics while the consumers would appreciate high product quality which excludes spoilage.

Modified Atmosphere Packaging (MAP) seems to be one way to achieve these goals. MAP is already common usage in several food industries. The dissertation was aimed at finding out whether this technical process can also be applied to baked goods.

Modified Atmosphere Packaging is a process in which the atmosphere inside a package is exchanged. The air inside the packages is removed and replaced by an inert gas, in general nitrogen, carbon dioxide or a mixture of both. The gases inside the package replace the oxygen and thus decelerate spoilage processes which are oxygen-dependent. Currently, MAP is mainly used for fruits and vegetables, meat and fish. In the baking industry, predominantly bread and cakes are considered to be potential products which might benefit from MAP because the spoilage with moulds can be reduced.

Three different pastry products were chosen for the test. They were packed in different materials on a Multivac vacuum chamber packer Type C350 which operates with a so-called "compensated vacuum". Air is sucked out of the package prior to pumping protective gas(es) inside. This process is considered to be favorable in terms of residual oxygen contents inside the packs.

During the storage of any products, an exchange of gases and water vapor from inside the pack with the gases in the environment will take place. Therefore, the film materials used must have a high water vapor and gas tightness. For fine bakery wares, it is also important that the packaging materials are oxygen tight.

The residual oxygen content in the packs was examined using a gas analyzer by PBI-Dansensor Deutschland GmbH. The tightness of the packages is crucial when applying MAP-methods.

The MAP baked goods were then subjected to a storage test. Here the time of storage until the beginning of spoilage was determined in trials. The products were stored at elevated temperatures to accelerate spoilage processes. At the end of the storage time, the products were subjected to a sensory evaluation as well as chemical and microbiological analysis.

Among the chemical parameters determined was the peroxide number which reflects the extent of fat spoilage which in

## Information

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turn is a measure for the oxidative spoilage due to oxygen present in the package. The microbiological test comprises among other the total germ count as measure for contaminations. Fine bakery wares contain a high amount of sugar and often have a low aw value. This means that they are less susceptible to microbiological spoilage. Nevertheless, one prerequisite for all MAP processes is absolute hygiene and operation at proper temperatures. If due to unhygienic processes microorganisms get into the package they might multiply even in an MAP atmosphere if they are anaerobes.

The dissertation on MAP packed baked goods has shown that more research is needed to determine the processes and materials suitable for a specific baked good. Nevertheless, it was clearly shown that MAP is a potential way for the packaging of fine bakery wares. +++

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