TECHNICAL APPLICATION
INFORMATION

Herbstreith&Fox

Pectin Prolongs the Fresh-Keeping of Bread Rolls and Dough

Introduction

In the past the buying patterns of consumers for freshly baked products have changed. The demand to eat freshly baked bread rolls for breakfast every day of the week – even on a Sunday – expresses this pattern.
Therefore many consumers fall back on frozen dough or part-baked products with different shelf-life which are on offer in the supermarkets. The consumer will then bake the semi-finished products. Even the gastronomy is asking for such products in order to be able to react quickly to a changing demand.

In the past convenience products showed many qualitative disadvantages compared to fresh products which is reflected in the baking behaviour and above all in the taste of the baked products.
Substantially these products get into the supermarkets either as frozen pieces of dough or as part-baked semi-finished products.
During storage time, which is about 6 months for frozen products and about 2 weeks for part-baked semi-finished products, they show changes in the dough structure with the result that the final product may be vastly different compared to fresh products.
In part-baked semi-finished products the starch tends towards retrogradation. Retrogradation is a process in which the swollen starch re-crystallises whereby the dough loses its water-binding. This behaviour will have the effect of a rather dry crumb structure in the final product. By optimising the recipe this baking behaviour of convenience products could be considerably improved.

Adding pectin improves the quality of the products. Due to its high water-binding capacity pectin influences the growth of large ice crystals in frozen dough.
Large ice crystals obstruct the smooth structure of the dough which may lead to an uneven baking behaviour.
The addition of pectin slows down the growth of large ice crystals so that small ice crystals will be maintained which will contribute to an even formation of the crust.

Products manufactured with pectin tend less towards drying out so that products which have been stored for a longer period of time show a high sensory quality after baking. Due to strong interactions a hydrate cover forms around the pectin molecule, the higher water-binding capacity can be noted by a higher dough yield of about 3%.
Furthermore several studies showed the positive influence of pectin on the retrogradation behaviour of starch.
Also the dough stability increases, so that mechanical handling of the dough is easier.

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In the trials the crumb of the baked dough showed a slightly higher elasticity than the reference products without added pectin.
Pectin is being mixed homogeneously into the flour or baking agent to achieve an even distribution of the pectin particles.
Positive effects can already be seen at a pectin dosage of 0.1% Pectin Classic CJ 205.
However, we recommend not to increase the pectin dosage above 0.5%. A pectin dosage which is too high will be noted by a high stickiness of the dough and the crumb due to the high water-binding capacities of the pectin.
Thus the dough is less easy to work and the volume of the baked product in our trials was also significantly reduced. With an optimal dosage of 0.3% pectin the pectin will not influence the usual dough rheology and the dough can be worked as always.
The produced doughs do not stick and are mechanically workable (EU dough trial). After the analysis with the farinograph and by using a flour type 550 the dough development time did not change but remained at 2.7 minutes and the dough stability was within the optimal range of 2 minutes.
The dough softening was very low (40 FE) which indicates good kneading properties. The extensibility of the wheat flour dough was evaluated with a extensograph.
The expansion strength after 90 minutes was evaluated with 530 EE; it was with an extensibility of 110 mm slightly below the optimum range.
The ratio of 4.7 means that the dough has a high ferment stability, so that the capability to retain gas is improved.

Summary

For the production of the dough pectin is evenly mixed into the flour. After adding the other ingredients the dough is then formed and kneaded.
After working in, fermentation and rest the products will be frozen or they will enter the market semi-baked. After baking these products show a thinner dry edge of the crumb and a prolonged fresh-keeping of 24 – 48 hours.

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