

BAKING UPDATE

Fresh Baked Bread Options

Practical technology from Lallemand Inc., parent of American Yeast Sales, producers and distributors of Eagle® yeast, fresh and instant.



Alternatives to Scratch Baking

CONSUMERS prefer baked goods with freshness and variety, and these have traditionally been produced by scratch baking. A number of alternatives are available that provide some of the benefits of scratch baking but with greater flexibility, convenience, and economy.

SCRATCH BAKING

Scratch baking remains the benchmark for quality, freshness, and variety. However, baking from scratch is labor-intensive and requires skilled labor. Small artisanal bakers that tend to specialize in trendy high-value products like pain au levain still use it as their main production system. At in-store bakeries, scratch baking is usually combined with the use of convenience products such as premixes, frozen dough, partially baked, and ready-to-use products. The proximity to the customer requires that scratch baking operations remain relatively small, and consequently they have some difficulties matching production and demand, especially when using traditional long breadmaking processes.

FROZEN BREAD

Bread is frozen mainly to facilitate production planning of some specialty items. While freezing bread adds extra costs for freezing and frozen storage, it can save costs by allowing bakeries to use longer production runs. Freezing preserves bread quality, but bread firms quickly during a freeze-thaw cycle. Bread should be frozen immediately after baking and should be frozen and thawed as quickly as possible. Some bakeries thaw the frozen bread during transportation to the store, others transport the bread frozen and thaw it in the store before sale (thaw and sell).

PARBAKED BREAD

Parbaked bread is produced in a large plant bakery by partial baking with special time and temperature profiles. The partially baked bread is reheated/rebaked to produce the freshly baked bread at home or at the point of sale. A major advantage of parbaked bread is its flexibility, because the time to produce freshly baked bread from parbaked bread is short. A major problem is the critical time and temperature control

required for the second bake. Once bread has been baked it has an open structure that can dry out very quickly. Even under optimal conditions some parbaked breads firm rapidly after the second bake and have to be consumed almost immediately. Three different types of parbaked bread are available that differ in how the preformed parbaked bread structure is stabilized:

Brown and serve bread is prepared when the first bake is carried out at a low temperature without forming much of a crust and almost no crust color. Because these parbaked breads contain high moisture levels and are not stabilized by a thick crust, they tend to wrinkle after baking. However, smaller items like dinner rolls will not wrinkle during storage at ambient temperature and can be baked at home by the consumer. Shelf life of this type of parbaked bread is limited because of its high moisture content, and molding has to be prevented by using high levels of preservatives and/or controlled atmospheric packaging. During the second bake crust color and flavor are generated, and the bake time

Continued

FRESH BAKED BREAD ALTERNATIVES

	APPLICATIONS	ADVANTAGES	DISADVANTAGES	BREAD TYPES
Scratch Baking	Artisanal and in-store bakeries	High quality and large variety of freshly baked bread	Labor intensive (skilled), costly, time-consuming	Mainly crusty
Frozen Bread	Thaw and sell	Facilitates production planning	Extra costs for freezing and frozen storage	Mainly noncrusty
Parbaked Bread	Brown and serve	Freshly baked flavor, ambient storage	Only small loaves, time and temperature of 2nd bake critical	Mainly noncrusty
	Parbaked frozen	Fast and convenient (reheating) bake-off	High costs due to high volume of frozen storage	Mainly crusty
	Milton-Keynes	Fast and convenient (reheating) bake-off, ambient storage	Additional production equipment (vacuum cooler), 1st and 2nd bake critical	Mainly crusty
Frozen Dough	Standard frozen dough	Cost-effective due to small volume of dough stored frozen	Inflexible (time for thawing and proofing)	Crusty and noncrusty
	Preproofed frozen dough	Fast, but requires programmable oven to bake frozen dough	Larger volume for storing frozen dough, lower volume for final products	Mainly crusty
	Substrate-limited frozen dough	Cost-effective due to small volume of dough stored frozen	Flexible, but requires special yeast	Only crusty

Alternatives to Scratch Baking (Continued)

and temperature remain critical since the finished rolls tend to firm very rapidly.

Parbaked frozen bread is prepared by almost completely baking the bread and freezing it immediately after baking. Freezing not only stops the firming of the bread crumb, but also preserves the crust by preventing moisture migration from crumb to crust, which normally causes the crust to become stale (less brittle, softer, tougher, more leathery). Parbaked frozen bread, which is especially suited to produce crusty bread, has to be kept frozen until it is reheated at a relatively low temperature in a convection oven at an in-store bakery. The reheating will generate and liberate an attractive flavor of freshly baked bread, and the low temperature during the second bake will largely prevent excessive drying out that could cause the rapid firming of the finished product. The major disadvantage of frozen parbaked bread is the high storage cost for the large product volume.

The Milton-Keynes process is designed to stabilize the preformed parbaked breads without freezing or refrigeration. This is achieved by using a vacuum cooler to stabilize the crusty parbaked structure without causing wrinkling or shriveling of the loaf during storage at ambient temperature. Time and temperature of the second bake remain critical, so a small travelling forced convection oven is used. In-store production of Milton-Keynes bread with the special oven and attention to detail yields a product that is indistinguishable from conventional scratch baking. The cost savings of the ambient storage are considerable, but the Milton-Keynes process requires investments in equipment at both the plant and in-store bakeries.

FROZEN DOUGH


Frozen dough is the most important alternative to scratch baking for in-store bakeries and other locations that serve bread. Only a small quantity of frozen dough is sold directly to the consumer for home baking. Despite the additional costs for freezing, transportation, and frozen storage, the use of frozen dough can be attractive, especially when producing freshly baked products that can be sold at premium prices. A major advantage of this well-established system is that frozen storage cost is kept low because of the lower volume of nonleavened dough in the freezer. A major disadvantage is the long time it takes to thaw, proof, and bake frozen dough into freshly baked bread, so it can be problematic to closely match production and demand in an in-store bakery. Frozen dough is also better suited to small items that will attain the set temperature of the proof box much faster than will large dough pieces. Producing bread from frozen dough doesn't require as much skilled labor as for scratch baking, but training and experience are still important. The shelf life of frozen dough is limited by the loss of yeast activity, but a three-month freezer life is possible by optimizing yeast, oxidation and other ingredients, and the production process.

PREPROOFED FROZEN DOUGH

Preproofed frozen dough has been developed to shorten the time it takes to prepare freshly baked bread from frozen dough. The preproofed frozen dough pieces can be placed in a programmable oven while still frozen and baked into freshly baked bread in about twenty minutes. The major disadvantages of preproofed frozen dough are

1) the higher frozen storage cost because of the larger volume of the frozen dough piece, 2) the investment in specialized equipment for bake-off, 3) the lower volume of the final baked product, and 4) the special ingredients and improvers required for optimal quality of the baked product. Preproofed frozen dough can also be used to produce bagels without a proofing step by thawing the preproofed dough pieces in a refrigerator, boiling them, and baking them in an oven.

SUBSTRATE-LIMITED FROZEN DOUGH

Substrate-limited frozen dough is a system that uses regular (nonleavened) frozen dough pieces to produce freshly baked bread in two stages. In the first stage the frozen dough pieces are thawed, fully proofed, and refrigerated. By using a special yeast strain that doesn't ferment maltose, the availability of fermentable sugar and consequently gas production can be limited to control the proof height. The fully proofed dough pieces can be refrigerated for 24 to 48 hours and are ready to use in the second stage when they are baked in an oven. A major advantage of separating the proofing and baking steps in this system is the great flexibility in matching demand and production. However, this system requires a special yeast and additional refrigeration equipment for the intermediate product. It can only be used to produce low-sugar (crusty) bread because the level of sugar in the dough has to be kept low to limit gas production. 


Lallemand Baking Ingredients

LALLEMAND Inc. is a leading producer of dough conditioners designed for bromate replacement, crumb softening, dough relaxation, and general improvement of bread quality. Essential® PBR-FD and Fermaid® Plus were specifically developed for frozen dough:

Essential® PBR-FD is a system of ascorbic acid and enzymes that is formulated to improve overall baking qualities in replacing the use of potassium bromate and/or potassium iodate. It improves tolerance and performance in industrial frozen dough applications.

Fermaid® Plus is a complete and balanced dough conditioner developed for use

in frozen unbaked dough as well as in more conventional yeast-raised products that demonstrate weakness. Properly used, Fermaid® Plus will extend the frozen shelf life, improve machinability, maintain good proof times, and produce a baked product with excellent volume, crumb structure, and taste. It is also well-suited to hearth products.

Lallemand/American Yeast offers a full range of yeast products and dough conditioners backed by experienced bakery technicians who can assist with specialty applications. 

LALLEMAND BAKING UPDATE

Lallemand Baking Update is produced by Lallemand Inc. to provide bakers with a source of practical technology for solving problems. If you would like to be on our mailing list to receive future copies, or if you have questions or comments, please contact us at:

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