

BAKING UPDATE

Dry Yeast

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



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Dry Yeast Rehydration

When yeast is dried the cell membrane becomes more porous than usual. During rehydration the cell membrane recovers, but while this is occurring cell constituents can dissolve in the dough water. The optimum temperature for membrane recovery is about 104°F.

Warm rehydration maximizes dry yeast performance by quickly reforming the cell membrane. Cold rehydration hurts performance by slowing down the recovery of the cell membrane and allowing more cell constituents to escape or “leach.” The effect is not that great between 70° and 100°F, but at lower temperatures up to half of the yeast cells’ soluble components can be lost.

Leaching affects yeast activity because although most of the enzymes remain, the solubles which promoted the activity of the enzymes are depleted. Leaching also affects dough consistency because glutathione is released. This contributes to dough slackening which can be desirable at low levels in some applications but undesirable in others.

Yeast producers minimize leaching in ADY by drying to a relatively high moisture level, and in PADY and instant yeast by adding emulsifiers. Bakers minimize leaching in ADY and PADY by using warm water rehydration or makeup, and in instant yeast by adding it to the flour before mixing or to the dough during mixing. 

Deciding Between Fresh Yeast And Dry Yeast

MOST North American bakers have a choice between fresh and dry yeast that they may not have considered. Here’s an explanation of the yeast differences and choices.

YEAST TYPES

Fresh yeast includes cream, granular (also known as crumbled compressed) and cake (also known as compressed). They all start as a dilute yeast broth at about 5 percent solids, which is concentrated to about 18 percent solids and washed with water. Cream yeast is simply this liquid yeast, which is delivered in bulk to the bakery. Granular yeast is produced from cream by increasing the solids to about 30 percent, then crumbling into granules and packing in bags. Cake yeast is produced like granular at a solids level of about 30 percent, but is extruded and formed into blocks instead of granules.

Dry yeast starts off like cake yeast, but is extruded through a screen instead of a nozzle and comes out as spaghetti-like strands. The strands are broken up into small particles, dried, and packaged. There are three basic types of bakers active dry yeast and a variety of yeast, ingredient, and packaging combinations.

Active dry yeast (ADY) is the oldest type of dry yeast and has been widely produced since the 1940s. It uses a combina-

tion of strain, growth conditions, and drying method to favor stability over activity. ADY requires high dose rates and warm water rehydration, but is sufficiently stable without protective packaging.

Protected active dry yeast (PADY) was developed in the 1960s by lowering the moisture content of ADY and adding emulsifiers and antioxidants. PADY requires the same high dose rates as ADY but is more stable and can be used in flour mixes without protective packaging.

Instant yeast was developed in the late 1960s using a new combination of strain, growth conditions, drying method, and emulsifiers to give high activity. Instant yeast requires protective packaging but does not require prior rehydration and can be used at lower dose rates than ADY.

ADY and PADY are still used for specialized applications, but only instant yeast represents a real alternative to fresh yeast for mainstream baking applications.

COMPARING FRESH YEAST AND INSTANT YEAST

The characteristics of both fresh and instant yeast are determined by the strain they are grown from and how they are grown. Some additional performance factors are affected by the drying process:

Functionality. Instant yeast causes more dough slackening than fresh does because it releases natural reducing agents during rehydration. Depending on dose rate, instant yeast may shorten the mix time.

Dough system. Instant yeast works best in straight and no-time dough where some slackening is beneficial. Instant yeast with ascorbic acid can also be used in sponge and dough and flour brew systems. Fresh yeast works in the widest variety of systems, including continuous mix and frozen dough where instant yeast is rarely used.

Product Types. Instant yeast has an advantage over fresh yeast in pizza and bun

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YEAST CHARACTERISTICS

TYPE	SOLIDS	PACKAGING	STORAGE	SHELF LIFE	USE RATE
Cream	18%	Bulk	Refrigerate	2 Weeks	170%
Granular	30%	Unprotected	Refrigerate	2 Weeks	100%
Cake	30%	Unprotected	Refrigerate	2 Weeks	100%
ADY	92%	Unprotected	Room Temp	3 Months	50%
PADY	96%	Unprotected	Room Temp	6 Months	50%
Instant	96%	Protected	Room Temp	1 Year	25–30%

Note: Information shown is typical for each type but may vary by product and supplier.

International Perspective:

REGIONAL YEAST TRENDS

Fresh yeast is still the most common form worldwide, but instant yeast has grown rapidly over the last fifteen years and is now used in over one hundred countries:

- Europe has the lowest instant yeast usage because of the number of fresh yeast producers, the short delivery distances, and the traditional practices of artisanal bakers.
- Africa uses fresh yeast in countries where it is produced (Morocco, Tunisia, Egypt, South Africa, and Zambia) and ADY or instant yeast elsewhere.
- South America uses a combination of fresh yeast and instant yeast based mostly on delivery logistics.
- China and Southeast Asia are growing markets for instant yeast because bread production is increasing. Instant yeast is generally preferred over fresh yeast.
- Japan and Australia are most similar to North America, with widespread availability of both fresh and instant with a trend toward increasing use of instant.

Deciding Between Fresh Yeast and Dry Yeast

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applications where it contributes to dough extensibility and flow. Fresh yeast has an advantage over instant yeast for large loaves of white pan bread, especially when high levels of calcium propionate are used.

Uniformity. Depending on the producer, instant yeast is more uniform than fresh yeast because there are more opportunities for analysis and blending before packaging. It is less affected by shipping and storage than is fresh yeast.

Storage and delivery. Fresh yeast is heavy, requires refrigeration, and has a shelf life of about two weeks. Instant yeast weighs up to 75 percent less, requires no refrigeration, and has a shelf life of about one year.

Convenience. Fresh yeast requires greater care before use to keep it cold and fresh. Instant yeast requires careful attention to proper rehydration at the time of use. Handling and measuring can favor either, depending on the size and type of bakery.

Specialty availability. Most fresh yeast represents a compromise for general purpose use, while instant yeast is available in a wider variety. An example is sugar-tolerant instant yeast that outperforms fresh yeast in sweet dough.

Economics. One pound of instant yeast replaces about three to four pounds of fresh yeast and usually costs about three to four times as much. Either fresh or instant can be more economical depending on the exact replacement rate, freight, storage, labor, throughput, and other factors.

FACTORS TO CONSIDER

These are factors to consider when deciding between fresh and instant yeast:

- Large wholesale bakeries producing white pan bread by a sponge, brew, or continuous mix system should consider fresh yeast if they are in a location for reliable delivery. Bakeries that use over one million pounds of granular yeast per year are candidates for a cream yeast system.
- Small retail bakeries producing a variety of products by a straight or no-time system should consider instant yeast, especially if they have trouble getting reliable fresh yeast delivery. In-store bakeries are especially likely candidates for instant yeast.
- Many pizza shell producers prefer instant yeast and most frozen dough producers prefer fresh yeast.
- Most large retail and small wholesale bakeries can use either fresh yeast or instant yeast with equal success. The cost is usually similar, and the decision depends on storage, measuring, and other convenience factors. 

Lallemand Yeast Products

LALLEMAND Inc. is a leading producer of yeast and baking ingredients, and supplies a full range of products to the baking industry through its subsidiaries Lallemand Distribution and American Yeast Sales.

YEAST

- Lallemand fresh yeast blocks and bags
- American fresh yeast blocks and bags
- Eagle® fresh yeast blocks and bags
- Bulk liquid cream yeast and installations
- Fermipan® instant yeast
- Instaferm® instant yeast

DOUGH CONDITIONERS

- Essential® PBR natural potassium bromate replacers for conventional and frozen doughs
- Essential® LCR natural L-cysteine and sulfite replacer
- Fermaid® potassium bromate replacers for conventional and frozen doughs
- Fermaid® Relax and Fermaid® P natural L-cysteine and sulfite replacers
- Eagle® CM potassium bromate replacer for continuous mix. 

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