

BAKING UPDATE

Buns and Rolls

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



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Bun and Roll Production

BUNS AND ROLLS as a category include a wide variety of soft and hard crust bread products with scaling weights of less than eight ounces. Hamburger buns and hot dog rolls are the most important products for American bakers, and these types of soft buns and rolls make up about 25 percent of U.S. bread production.

Many commercial bakeries that produce conventional white sandwich bread also produce hamburger buns and hot dog rolls. Although most of the production aspects are similar, there are some important differences in equipment, processing steps, and formulas.

PROCESSING

All the major dough systems (straight dough, sponge and dough, water brew, flour brew, continuous mix, and Chorleywood) that are used commercially for white pan bread can also be used for buns and rolls, but the combination of flour brew and conventional mix is most common.

Preferment for buns and rolls is usually a flour brew containing half the flour and almost all the yeast and water. It is fermented for about two hours at 85°F then cooled down to 40–45°F using a heat exchanger. Other preferments can be used, but a flour brew provides better control and pre-

vents the dough temperature from rising too much during the subsequent mixing step.

Mixing usually takes place in the same type of horizontal barrel mixer used for large-scale pan bread production. The fermented brew, oil, the rest of the flour, and the remaining ingredients are added and mixed into a dough. Compared to white pan bread, bun and roll doughs are softer and flow easier because they contain higher levels of sugar and oil. Sometimes salt is added later during mixing to increase water absorption, accelerate cleanup, and provide more dough development without increasing dough temperature. The mixed dough should be well developed even though additional energy will be applied as it passes through the dough pump and divider.

Makeup is usually handled by a fully integrated automatic system designed specifically for buns and rolls. The core of one type of system is a pocket divider like an AMF Model-K and Pan-o-Matic. These dividers have rotating cylinders with pistons that draw dough into pockets, scrape off the excess, then eject the scaled pieces onto rounding belts. A new development used in other systems is the extruder/divider. It extrudes the dough through an orifice, cuts it to the desired length and weight with a rotating knife, then transfers the pieces to rounding belts. From the round-

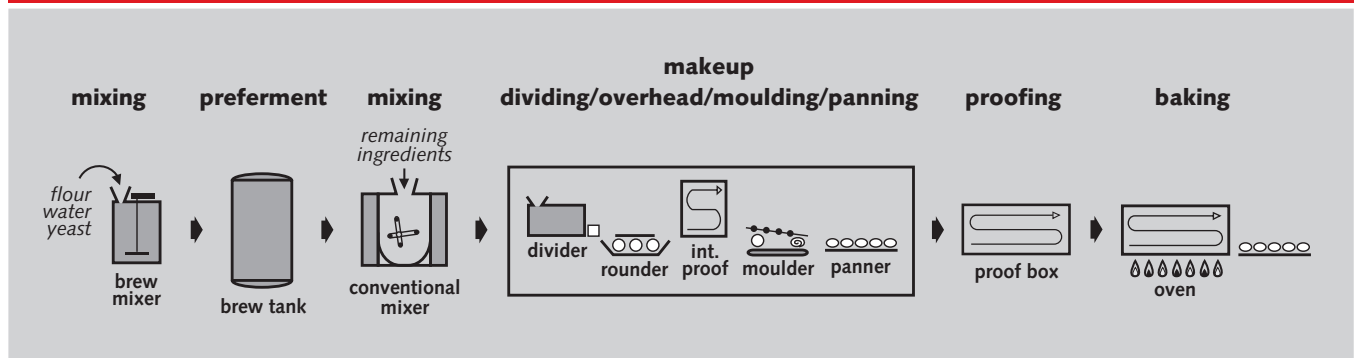
ing belts, the dough pieces are transferred into the baskets of an overhead proofer for an intermediate proof of about three minutes. The dough pieces exit the overhead proofer into a moulder/panner that shapes them and deposits them onto baking pans. Indentations in the baking pans are three-eighths to three-quarter inches deep to cover the “heel” of the bun or roll.

Proofing and baking can use the same equipment as for pan bread production, but most dedicated bun and roll plants use a continuous “proof and bake” system. In these systems the baking pans are attached to a conveyer belt that runs through the proofer, oven, and depanner. After the depanner, the baking pans are detached from the belt. Since the baking pans don’t need to be transferred from one conveyer belt to another, they avoid the mechanical abuse that can damage fully proofed dough pieces when they are not fully supported by a pan. Traveling through the proofer and oven also averages out variations in temperature and humidity. Most bakeries proof buns and rolls for 50 to 55 minutes at about 105°F and bake for 6.5 to 9 minutes at about 440°F.

Depanning, cooling, slicing, and packaging begin as soon as the buns and rolls leave the oven. Depanning should take place before the crust gets soft and starts to wrinkle.

Continued

FLOUR BREW SYSTEM FOR BUN AND ROLL PRODUCTION



Bun and Roll Production (Continued)

The buns are transferred from the depanner onto a conveyer belt to cool them to a core temperature of about 100°F then sliced and packaged into bags or pillow-packs.

INGREDIENTS

Flour requirements for buns and rolls are similar to white pan bread. The protein content should be 12 percent or higher. A mixture of hard red winter wheat with a significant amount of hard red spring wheat is preferred for optimum handling and appearance.

Sweetener levels are higher than for white pan bread, typically 10 to 14 percent.

Oil levels are also higher than for white pan bread, typically 3 to 6 percent.

Yeast levels must be increased to make up for the higher sugar level. In plants that use a common preferment for buns, rolls, and bread, this is usually done by adding extra yeast to the dough.

Other ingredients such as salt, emulsifiers, enzymes, oxidants, and mold inhibitors are added to the dough side at levels similar to white pan bread.

OPTIMIZATION

Optimizing quality and consistency is more difficult for buns and rolls than for white pan bread. The dough pieces are smaller, the abuse during dividing is more severe, and the dough pieces are not fully supported by a pan during proofing and baking. Dough development is critical because the dough must be soft enough for processing but strong enough to hold up during the final proof and baking. Finished product appearance requires a large volume without asymmetry or break and shred. And the finished product also has to perform—sliced hot dog rolls need a flexible “hinge,” and some hamburger buns must withstand grilling, toasting, or microwaving.


Here are some practical recommendations:

- **Keep time and temperature parameters constant.** This is important for baking, for proofing, and for the preferment, where constant time and temperature help maintain consistent pH, total titratable acidity (TTA), and dough development.
- **Maintain a constant cleanup time at the mixer.** This is important for dough development and requires dough cleanup times after starting the mixer to remain constant with less than 15 seconds variation. Delay salt addition if necessary to maintain constant cleanup time, dough development, and dough temperatures (within 1°F).
- **Mix-out the dough properly.** New extrusion dividers contribute more development, so they require a cooler but well-developed dough coming out of the mixer.
- **Depan immediately after baking.** Depanning within 30 seconds helps avoid damaging the finished buns and rolls.
- **Maintain equipment and adjustments.** Equipment wear causes variations as well as breakdowns. Use appropriate amounts of a suitable divider oil and check scaling weights frequently. Also make sure that excess gas has escaped from the dough before it goes into the divider.
- **Use adequate oxidation.** A combination of ascorbic acid and azodicarbonamide (ADA) gives the best results.
- **Use the right balance of emulsifiers.** Adjust the type and quantity for dough strength and crumb softness. Too strong of a dough causes dark spots from air inclusions just below the crust. Too weak

TYPICAL SOFT ROLL FORMULA

BREW	
Flour	50%
Water	50%
Yeast	2.5%
DOUGH	
Flour	50%
Water	5% (var.)
Yeast	1.5% (var.)
Salt	2%
Calcium propionate	0.25%
Oil	3–6%
Sugar	10–14%
Emulsifiers	0.5% (var.)
Enzyme-based dough conditioners	var.
Oxidants	var.

of a dough gives uneven crust coloration at the points where the dough tends to collapse. Readjust and optimize when new flour comes in.

- **Use enzyme-based dough conditioners.** They can be used to replace bromate for oxidation, improve crumb softness, extend shelf life, and help maintain consistency and improve tolerance. 


Bun and Roll Problem-Solvers

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. Lallemand and American Yeast offer a range of enzyme-based dough conditioners for production of buns and rolls.

Essential® PBR 200 DF, PBR-100, and PBR-100 TAB are state-of-the-art enzyme-based dough conditioners designed for potassium bromate replacement without losing quality, consistency, or tolerance. Essential® SOFT V, SOFT VI, and

SOFT TAB are enzyme-based products developed for improving crumb softness and extending shelf life.

Lallemand/American Yeast also supplies a complete line of emulsifiers for production of buns and rolls and a range of oils for lubricating roll dividers.

All Lallemand products are backed with problem-solving technical support from experienced bakery technicians that understand the unique challenges for bakers producing buns and rolls. 

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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