

# BAKING UPDATE

## Bread Production

Practical technology from Lallemand Inc.

### Comparing Breadmaking Systems

**T**HERE ARE FOUR basic wholesale breadmaking systems, from which countless variations have been adapted. Each system is a combination of five basic processing steps. Focusing on the processing steps helps to clarify the terminology and allows comparisons between systems and bakeries.

#### PROCESSING STEPS

**Preferment** is a general term for the sponge or brew stage, where yeast and water interact with flour or sugar before

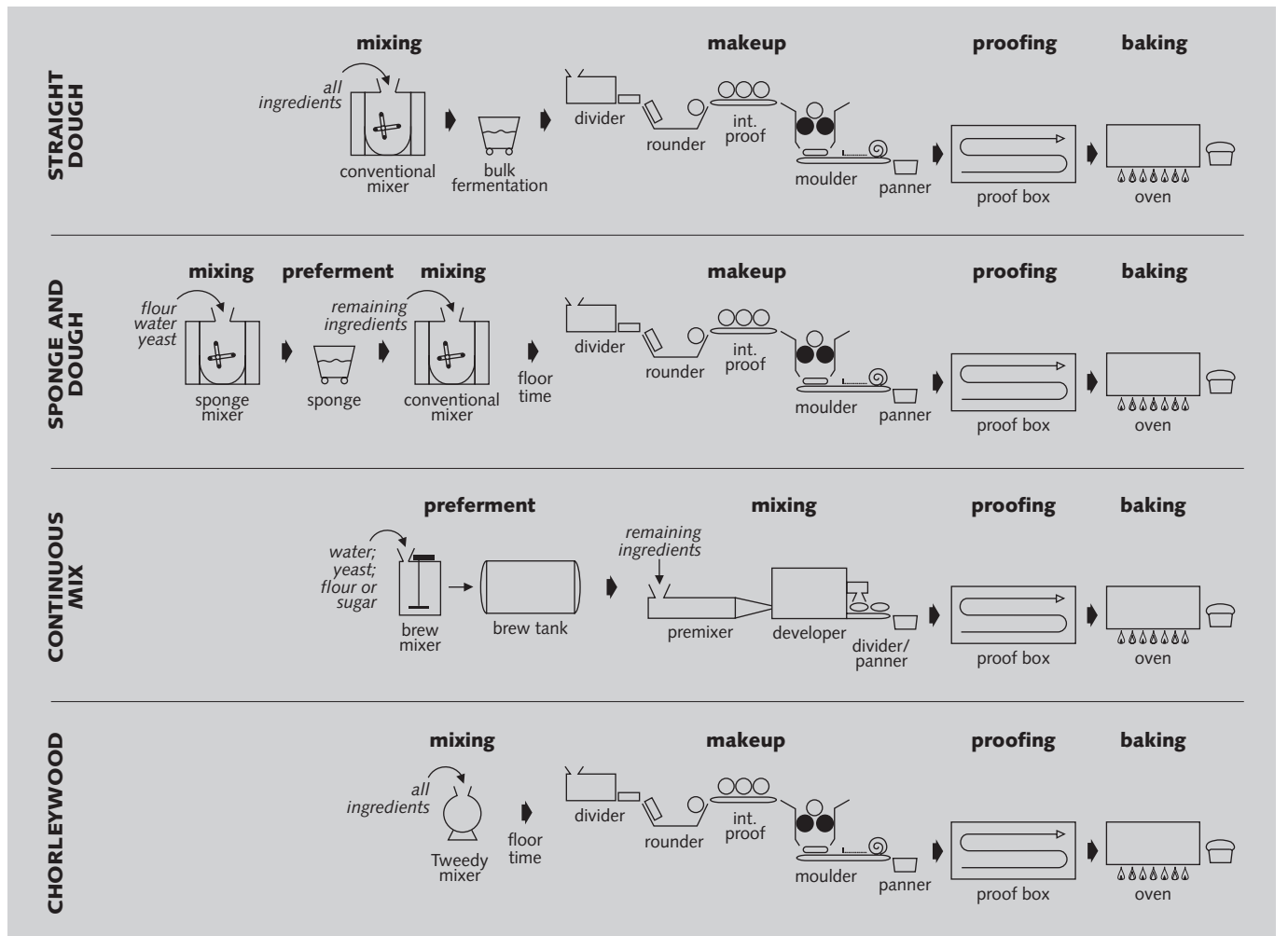
they are mixed with the remainder of the ingredients. The preferment activates the yeast so that its gassing activity is higher in the final dough, especially in high-sugar recipes. The preferment also produces flavor precursors and develops the dough if flour is present.

**Mixing** produces a homogenous dough by blending the flour, water, yeast or preferment, and other ingredients. Mixing develops the gluten protein in the flour for optimum gas retention at the later stages of proofing and baking. Mixing also

hydrates the flour particles and incorporates air into the dough.

**Makeup** begins with *dividing*, which separates the bulk dough into pieces of the correct weight. *Rounding* removes the roughness and stickiness of the dough pieces, adds dusting flour, and restores a smooth surface. *Intermediate* or *overhead proofing* gives the dough piece a five- to ten-minute rest after rounding so it can recover for better machinability. *Moulding* is done in three steps: sheeting the dough

*Continued*



## BREADMAKING SYSTEM CHARACTERISTICS

	STRAIGHT DOUGH	SPONGE AND DOUGH	CONTINUOUS MIX	CHORLEYWOOD
<b>Mixing</b>	Conventional	Conventional	High speed	High speed
<b>Preferment</b>	None	70% Flour	0 – 50% Flour	None
<b>Makeup</b>	Conventional	Conventional	Divider/Panner	Conventional
<b>Automation</b>	Low	Medium	High	High
<b>Fermentation loss</b>	Medium	Low	Medium	High
<b>Tolerance</b>	Medium	High	Low	Low
<b>Total time</b>	3 – 4 Hours	5 – 6 Hours	3 – 5 Hours	2 Hours
<b>Variations</b>	No-time dough	Flour brew	Conventional makeup	

### Comparing Breadmaking Systems *(Continued)*

into a flat piece, curling it into a cylinder shape, then compressing it to seal its seams. *Panning* transfers the dough piece from the moulder to the bread pan, where it is placed seam-side down.

**Proofing** increases the volume of the dough in the pan by allowing the gluten to regain its elasticity and the yeast to produce gas. Optimum proofing conditions are 95° to 100°F (35° to 40°C), with a relative humidity of 80 to 90 percent, for about sixty minutes. Panned dough is usually proofed to a specified height, and higher temperatures are frequently used to reduce the time required.

**Baking** transforms the dough into bread. In the oven, dough expands, takes on a stable shape, develops the desired flavor, and forms a crust. Wholesale bakeries typically use continuous ovens that convey the pans through series of zones. Typical baking conditions for white pan bread are 425° to 450°F (220° to 235°C) for fifteen to twenty-five minutes.

#### STRAIGHT DOUGH

*Straight dough* is the most traditional wholesale breadmaking system. All the ingredients are mixed together in a conventional horizontal or vertical mixer for about ten minutes. The resulting dough is then usually placed in a trough and allowed to ferment in bulk for two to four hours while it is punched down or turned to control its volume. Fermentation is followed immediately by makeup, proofing, and baking.

*No-time dough* is a variation of the straight-dough system, where the two- to four-hour bulk fermentation is replaced by five to twenty minutes of floor time.

#### SPONGE AND DOUGH

*Sponge and dough* is the dominant wholesale breadmaking system in North America. The sponge is a thick or “plastic” preferment that usually contains about 70

percent of the total dough flour and ferments in a trough for three to four hours. After prefermentation, the remaining ingredients are added and remixed in a conventional vertical or horizontal mixer. The resulting dough is usually given five to twenty minutes of floor time before makeup, proofing, and baking.

*Flour brew* is a variation of the sponge-and-dough system, using a one- to two-hour prefermentation that contains less flour and more water so it is thin enough to pump. Continuous flour-brew systems replace the sponge trough with a horizontal tank. The preferments are pumped through the tank to achieve the desired residence time.

#### CONTINUOUS MIX

*Continuous mix* was a significant wholesale breadmaking system in North America in the 1970s, but its use has been declining since. In the most common Do-Maker and Amflow systems, a liquid preferment is combined with the other ingredients in a pre-mix step, then pumped to a developer. The developer kneads the dough at high speed under pressure for one to five minutes. The dough leaves the developer in a flowable, pressurized form, passes through an integrated divider/panner that replaces normal makeup, then is proofed and baked. The resulting finished product has a finer, more-uniform texture than with other systems.

Most variations of continuous-mix systems make the finished product more similar to that of conventional systems. Flour brew preferment may be used instead of water brew, air may be injected into the developer to make it less anaerobic, and conventional makeup may be used.

#### CHORLEYWOOD

*Chorleywood* is the least common of the four wholesale breadmaking systems in North America. It is named for the British Flour and Baking Research Association at Chorleywood, England, which introduced

a batch mechanical dough-development system based around the Tweedy high-speed bowl mixer. A straight no-time dough is prepared by mixing small batches of all the ingredients at high speed for three to five minutes. After a short floor time, the dough goes through conventional makeup, proofing, and baking.

#### OTHER SYSTEMS

*Water-brew* systems use a one-hour prefermentation that contains no flour, only sugar, and a buffer or dairy solids to control pH. After prefermentation, the brew can be chilled and stored before it is added to the remaining ingredients for the rest of either a conventional or continuous-mix process.

*Remix* and *100-percent-sponge* systems resemble straight dough because all the flour is added at the initial mixing. But a portion of the other ingredients are added in a remix step after bulk fermentation so that dough-turning is eliminated and processing time is shortened.

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### BAKING UPDATE

*Lallemand Baking Update* is produced by Lallemand Inc. to provide bakers with a source of practical technology for solving problems. You can find the latest issues online at [www.lallemandbaking.com](http://www.lallemandbaking.com).

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