Bagels

BAKING INDUSTRY RESEARCH TRUST

> INFORMATION SHEET

DEFINITION

Ring-shaped roll with a dense, chewy texture. Made from a very tight dough dipped in boiling water before being baked to give a shiny glaze and smooth surface. Usually sliced open, toasted and topped with savoury or sweet condiments.

HISTORY

The first commercial bagel is said to have been created by an unknown Viennese baker who wanted to honour the Polish King John III Sobieski who repulsed the Turks invasion, thereby saving Vienna. As a symbol of King John's skill as a horseman, the baker formed yeast dough into a ring, supposedly resembling a stirrup. The Austrian word for 'stirrup' is beugel.

INGREDIENTS

INGREDIENT	FUNCTION & SPECIFICATIONS
Flour	High gluten flour with protein content 13.5–14% gives body and toughness to the bagel. Flour also provides flavour due to the low moisture content.
Defatted soy flour	Used at 0–3%* it increases dough absorption, and improves crumb and resilience of the bagel. Aids colour of bagel by darkening crust and improving toasting characteristics.
Yeast	For fermentation, compressed yeast is used at 0.5–2%*. High levels of yeast lead to over proofing and collapse of the bagel after boiling.
Salt	Added at level 1.5–2.2%* to retard fermentation after boiling and toughen the gluten in flour as well as for add flavour.
Sugar	Although bagels are not considered sweet, sugar provides fermentable carbohydrates for yeast fermentation and residual sugar contributes to browning of the crust. From 0 to 4%* can be added as sucrose, dextrose or corn syrup.
Vegetable oil	Added at 0–5%*, oil acts to lubricate the dough and increase crumb tenderness. Alternatively, shortening can be used up to 3%, which improves volume and eating quality.
Whole eggs	Provides flavour and colour so addition levels depend on end product specifications.
Dry nondiastatic malt	If Malt is used then level of sugar addition can be reduced. Added at 2–3.5%* malt is primarily included to give bagels a golden brown crust colour.

**Based on flour content.*

Additional ingredients, such as honey, molasses, fruit and nuts can be used to add sweetness, natural flavours and variety. Other optional ingredients include: monoglycerides (extend shelf life), wheat gluten and dough strengtheners.

PROCESSING

Bagels aren't made in the same way as bread. Before baking the bagels are boiled or poached. Boiling gelatinizes the starch on the surface of the dough giving a glossy exterior which distinguishes them from regular bread rolls. The boiling process also sets the outside structure of the roll so the bagel retains its shape during the baking process.

There are two dough systems that can be used:

1 No-time dough method. This system is used by many retail operations, requires high levels of yeast as well as reducing agents and high levels of oxidants.

2 Retarder method. Older method but considered to be better method. This is outlined below.

PROCESS	DETAILS
Mixing	It is essential that the bagel dough is properly mixed as the gluten needs to be fully developed. As the bagel dough has low water absorption and is very stiff it is easier to under mix than over mix the dough. After mixing, the dough should be rested for 5 minutes.
Dough temperature	The final dough temperature should be 24–27ºC as the temperature has a big effect on the texture, especially the crumb structure, of the final product.
Scaling & makeup	An average bagel is made from approximately 60–90 g of dough, although they can be produced in all different sizes. The bagel dough is not usually fermented before make up as fermenting can make it difficult to form bagels into their traditional shape. Bagels can be formed manually or by automated machines, which produce a more uniform shape. Raw bagels are placed on sheet pans, then proofed or more commonly placed in a retarder at 2–6ºC. Some bakers even place bagels in the freezer for 2 hours.

Proofing	Allows bagels to warm up and expand slightly before the boiling stage. If bagels are not proofed properly then they will not rise to the surface when boiled. Over proofed bagels tend to collapse when removed from water. Optimum temperature and times for proofing are dependent on the bakery but low relative humidity (65–75%) is important.Bagels held overnight or for a short time in a freezer are proofed at lower temperature(30–32ºC) than continuously produced bagels (40–44ºC).
Boiling	Unique process step for this product which achieves two things: 1 Full gelatinisation of the starch on the surface gives the bagel a glossy appearance. 2 Sets the outside structure so its shape is retained during cooking. If they are not boiled they will expand excessively in the oven and will look like regular hard rolls. When placed into the kettle, bagels should sink to the bottom for about 30 seconds and then float. They should be boiled an additional minute, meaning 30 seconds each side, Then removed from water and placed on boards for baking. To avoid unnecessary waste of energy, it is recommended that water temperature is kept just below boiling.
Baking	As bagels are prepared from a lean dough with low sugar levels and little or no milk, they must be baked at a relatively high temperature to develop good crust colour. Baking conditions vary based on the bakery but recommended conditions are 15–20 minutes at 230–290ºC with no steam as the outside of the bagels are already gelatinised. NB: Alternatively, the boiling step could be removed and the bagels baked with a large amount of wet steam.

TROUBLE SHOOTING

PROBLEM	PROBABLE CAUSE	REMEDY
Surface is dull	Water temperature is too cold Bagels are not boiled long enough	Increase water temp to 93–100ºC Increase boiling time for bagels
Bagel is small and hard	Bagels are not given enough fermentation time before boiling Yeast levels are too low Bagels are boiled too long	Proof bagels longer Adjust yeast levels Shorten boiling time
Bagels have blisters	Bagels are retarded too long before boiling The retarder is too dry	Reduce holding time in the retarder. Cover bagels or reduce air movement in retarder
Bagels have flat bottoms	Dough is too soft Flour is too weak	Not fried enough on first side or fat too hot Reduce moisture in the dough
Bagels are very large and soft	Bagels are over proofed Bagels are not boiled long enough	Reduce yeast level & proof time before boiling Check salt level in formula and boil bagels longer
Bagels stick to the oven plates	Bagels are wet when the boards are turned	Dry bagels longer before turning
Bagels collapse or shrink in the oven	Under mixing Temperature of dough too cold Bagels are over proofed	Mix to proper development and temperature Proof dough less before boiling
Bagels tear apart at makeup	Dough is too hot or old	Mix to proper temperature & check salt level
Bagel surface tears in oven	Dough is old	Check make up procedure and salt level

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