

> INFORMATION SHEET

DEFINITION

Steamed bread, or 'man-t'ou', is the staple food of the wheat growing areas of Northern China. They represent approximately 70% of the end usage of flour produced in this region and a much lesser proportion in the south where noodles and rice are more popular. Dough for steamed bread is made from fermented wheat flour and the product is cooked in a steamer above boiling water to produce a roll-sized product with a smooth, white skin and no crust. The texture varies from dense to open, and flavour is dependent on the region of production, with two major types of steamed bread: Northern Style, which is preferred in Northern China and has a chewy and dense texture; and Southern Style, which is more open with a softer texture. Other forms of steamed bread include: steamed twisted rolls and steamed stuffed buns – filled with meat, vegetables or sweet red bean paste. They are eaten throughout the day and consumer preferences mean that they are eaten fresh as their sensory attributes deteriorate rapidly once manufactured. Although traditionally made at home, there is now a trend for production in small factories or workshops. However, most steamed bread facilities have simple equipment and are based on manual labour.

HISTORY

Steamed bread has been eaten in China at least since Western Han Dynasty (206 BC – 24 AD).

INGREDIENTS

The main ingredients are flour, water, salt and yeast, although occasionally sugar is added for flavour. Most steamed bread is fermented using either a freshly prepared starter dough or sour dough kept from the previous day. After fermentation the dough is sour due to the by-products of fermentation by *Lactobacillus* spp. Yeast and baking powder tend to be used if making steamed bread in the home. A standard recipe with the percentages based on flour weight might be: Flour 100%, Yeast 0.5%, Water 50–55%.

A range of spring and winter wheats are grown in China, with protein content ranging from 10 to 13%, the stronger wheat generally grown in the North. Roller milling is used to produce two main flours: a white flour of 70% extraction and a standard flour of 80% extraction. The resulting protein quantity and quality of the flour is important for the production of acceptable steamed bread, with low protein soft wheats best suited for steamed bread manufacture. Either type of yeast can be used but if instant dry yeast is chosen then an additional 3% water with a slightly shorter mixing time is required.

Instant active dry yeast works as well as fresh yeast in steamed bread dough and offers reproducibility often difficult to achieve with fresh yeast over time. Trials have shown that shorter fermentation times with higher yeast quantity did not produce steam bread of equal quality to that with longer fermentation and less yeast. Quality characteristics of steamed bread are affected by dough water absorption, sugar-yeast combinations and fermenting and proof times.

Rubenthaler et al (1990) recommended from their research that ideal ingredient and processing methods would be as follows: 160 g flour, 8% sugar, 2% shortening, 1% instant active dry yeast with optimum water and dough mixing. Ferment the resulting dough for 3.5 hours followed by sheeting, dividing, moulding, 58 minute proofing and finished with 10 minutes in a steamer optimised system.

PROCESSING

PROCESS	DETAILS
Mixing	Dough is mixed at a low speed, enough to ensure appropriate gluten development.
Fermentation	Three distinct steps: 1. Preparation of starter: produced daily, by dispersing the sour dough remaining at end of day into water, adding additional flour and allowing the dough to ferment over night for use next day. 2. Four types of fermented dough can be used dependent on the required end application: A) Full fermentation - 1 - 3 hours based on season. Used to make Southern Style steamed bread, steamed twisted rolls and steamed stuffed buns. B) Half fermentation - 0.5 - 1.5 hours. Used to make steamed stuffed buns filled with gravy. C) No-time fermentation is used in small factories. Flour, water, starter dough and sodium carbonate are mixed, then dough is moulded, proofed and steamed. The amount of sodium carbonate is approximately 6 g per kg of flour, although it is dependent on temperature and length of proofing. D) Remixed fermented dough. After the dough is fully fermented, more flour is mixed in up to a ratio of 50% by weight. This is used to make Northern Style and speciality steamed breads.
Neutralisation	As fermented bread is sour, it needs to be neutralised with an alkali, e.g. 40% sodium carbonate solution. Alkali assists fermentation as it neutralises the acid. This is a critical stage as over-neutralised bread is yellow or dark in colour with a strong alkaline flavour and objectionable bitter taste due to breakdown of protein into smaller units.

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Moulding	When neutralisation is complete, the dough may require further mixing depending on the strength of the flour. The dough is divided into pieces, usually weighing 130–150 g, which are moulded into round or cylindrical shapes by hand or machine.
Proofing	Dough pieces are placed into a steamer tray made out of bamboo or aluminium, and placed in a proofing cabinet at 30°C, 85% Relative Humidity for 10–30 minutes, although the time is dependent on desired end product.
Steaming	The tray is transferred to the steamer. The water should be boiling vigorously and its cover should not be opened during steaming. Steaming takes 20 minutes and is timed from escape of steam from the top of the steamer.

QUALITY REQUIREMENTS OF THE END PRODUCT

- Uniform shape and crumb structure, which is soft and moist.
- Specific volume is dependent on processing conditions, but is usually 2.5 times dough weight for denser Northern Style and 3 times for Southern Style steamed bread.
- White colour inside and out.
- External appearance should be smooth with semi glossy finish.

Product quality is highly dependent on flour quality. Steamed bread produced in the North is usually of a better quality than the South as dough strength and colour of flour derived from wheat varieties grown in the North is of a higher quality.

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