Bread fermentation methods

SIMPLIFIED EXPLANATION OF HOW BREAD PROVES
The aim of the bread fermentation is to enable the dough (bread, pizza, cake...) to rise. When the dough is in a hot atmosphere (30-40 °C), an alcoholic fermentation occurs as yeast or leaven is added and carbon dioxide is released. The CO2 bubbles produced, alter the dough structure (reorganisation of the gluten network). The dough becomes more elastic, the volume increases, the taste changes and the aromas develop.

To properly understand proving process, it is important to identify factors affecting the retarded proving process and the 3 different stages of bread fermentation.

FACTORS INFLUENCING FERMENTATION
- **Duration of kneading.** The more the dough is kneaded, the more it will form into a smooth extensible dough with good gas holding properties.
- **Quantity of yeast / leaven.** The higher the quantity is, the longer the fermentation time is.
- **Fermentation temperature (room /dough) (2 °C-40 °C).** The higher the dough temperature, this will speed up the proving process.
- **Weight of dough pieces.** The bigger pieces will need more time to rise.
- **Dough hydration (water quantity).** Water facilitates the activity of the yeast.
- **Flour used.** The more it is rich in gluten, the faster the fermentation process is.
- **Hygrometry rate.** The higher it is, the faster the proving process is.
- **Addition of additives / improvement agents** gives strength to the dough.
- **Quantity of salt and / or sugar.** The more you add in, the less fermentation is active.
- **Retarded proving time.** A short fermentation time will give a tight / compact crumb after baking. This will result in a longer retarder proving time generating larger alveolus. Also it will assist in developing aromas.
- **PH / acidity of the dough.** The more acidic the dough, the less fermentation time will be required.
STEPS FOR RETARDER PROVING BREAD-MAKING

Benching: this is the first period of the dough fermentation between the kneading and weighing phase. Scoring is done by mass in a bowl or dough containers. Its primary role is to increase the strength in the dough. It corresponds to an initial modification of the dough for a better gas retention. The second part of the score is to stimulate the development of aromas and increase the acidity of the dough through the multiplication of ferments. The time varies depending on the work method and the selected fermentation type.

The resting: is a fermentation period between the division and molding phase. The goal is to relax the gluten to facilitate the moulding required afterwards. The resting is done either on a dough resting cabinet or on a manual/automatic proofer.

The retarded proving: is a long fermentation phase that begins after moulding and ends at baking when the temperature reaches 50 °C (where the yeast is destroyed). It is done either on trays or on trolleys in the retarded proving chamber/cabinet. The aim is to produce and retain the gas in order to contain the volume. The dough begins to have an honeycombed structure. The time varies according to the chosen working method.

There is no perfect method for retarded proving. The retarded proving process will be defined depending on the chosen fermentation technique. It will take into account factors affecting fermentation and the desired bread quality: compact crumb, honeycombed crumb, highly developed flavors, shelf life, crumb colour, crust thickness...

To obtain the desired product which incorporates all the required elements there are different fermentation techniques as follows:

FERMENTATION TECHNIQUES

Originally in order to bake bread for the early morning, the baker had to work all night long to knead the dough to a certain point, weigh, leave it to rest, mould it and allow for fermentation and finally bake the dough. With the arrival of the retarded proving equipment, manufacturing methods have evolved and bakers working hours have been reduced.

Different fermentation methods commonly used:

**Direct fermentation:**
The dough is kneaded, proceeded into a “first fermentation”, weighed, rested, moulded and then fermented very quickly (3-4 hours) and baked immediately. This method produces larger size bread, the crumb is very regular and the crust is thin. However, it has poor shelf life, it dries quickly and tends to soften.
Indirect Fermentation: delayed pointing also called mass proving:
The dough is mass stored in dough containers or bowls at 6 °C for a pointing period from 10 to 48 hours (depending on the yeast quantity). The baker can, for example, knead the dough in the afternoon. Fermentation only takes place at night until dawn. The dough pieces will be moulded and baked available in the early morning.

Indirect Fermentation, the slow proving:
The dough is kneaded, pierced (only for a very short time), weighed and then molded. The dough pieces are stored for several hours at a temperature generally between 8 to 15 °C. Depending on the dose of yeast used and room temperature, the proving time varies. The dough should be firm. This method of slow proving, allows some freedom for the baker. He can anticipate or delay baking the dough the moment to bake.

Indirect Fermentation, frozen controlled proving (slow proving for tubs):
The dough is kneaded, proceeded to first fermentation called “benching” (very short), and divided, formed, rested (short term) and shaped. The dough rising is completely blocked at a low temperature (between +2 to +5 °C) for 24 to 72 hours. The dough has to be firm. A few hours before baking, the dough must rise in temperature (> 15 °C). The baker may bake several times during the day.
Indirect Fermentation: frozen pre-proved:
The dough is kneaded, proceeded to benching or first fermentation, rested and shaped. Unlike the two previous methods, the baker starts proving of the dough at 25 °c. When ¾ of proving time has been reached, the dough is blocked at 4 °C for several hours (12-20h). This technique allows the baker to hot offer bread to their customers. Depending on demand in the shop, dough pieces are thawed, scored and then baked about 30 minutes later.
This method requires a firm dough, rich in yeast and improving agents.

All Hengel's retarder proving cabinets, chambers and tunnels allow for the direct and indirect fermentation to meet all the bakers working methods. For mass proving, Hengel offers a special range of cold rooms for dough conditioner trolleys (CFPB). To request information or a quotation, please contact us.