Chapter-7
Methods of Bread Making

7.0 UNIT OVERVIEW & DESCRIPTION

Overview:

This unit will provide information to the students about the dough making methods for bread making. It will help them to understand the straight dough method with salt delayed method and no time dough method. It will also help them to understand the sponge and sough method.

Knowledge and skill outcomes:

i) Understand the straight dough method.

ii) Understand the sponge and dough method.

Resource Materials:

- Sultan, *W. J. Elementary baking.* New York: McGraw-Hill, c1969.
- Sultan, *W. J. Practical baking. 5th edition.* New York : Van Nostrand Reinhold, c1990
- Leader, *D. & Blahnik, J. Bread alone.* New York : William Morrow, c1993.

- Matz, S. *Formulas and processes for bakers.* McAllen, TX: Pan-Tech International, c1987.

Duration: Total Hours 10

Learning Outcomes:

7.1 Introduction to Methods of Bread Making	General Overview
7.2 Straight Dough Method a) Salt Delayed Method b) No Time Dough Method	• Understand the Straight Dough Method • Learn the Salt Delayed Method and no time Dough Method
7.3 Sponge and Dough Method	• Understand and learn the Sponge and Dough Method

Assessment Plan: (For the Teachers)

Unit–7	Topic	Assessment Method	Time Plan	Remarks
7.2	Straight Dough Method a) Salt Delayed Method b) No Time Dough method	Exercise: Question & Answer		
7.3	Sponge and Dough Method	Exercise: Question & Answer		

7.1 INTRODUCTION TO METHODS OF BREAD MAKING

Present day bread production scenario has changed to a very large extent in comparison with conventional methods. High speed machine and modern technology has made it possible to produce more, of a better quality and within shorter time. However ; in spite of the benefits of modern technology, it is necessary for a student to understand the conventional methods which is like a stepping stone to modern day practice.

The Baking Process

The basic process of baking yeast bread starts with measuring and mixing the various ingredients to make the dough and adding yeast so that it rises. The dough is then kneaded to develop the gluten and is again allowed to rise. The kneading and rising steps may be repeated several times. Next, the dough is shaped into a loaf and baked. Baking cooks the dough, firms the loaf and forms a crust on it, and improves the flavor. Finally, the loaf of bread may be sliced before being wrapped.

Commercial bakeries have machines that do the work of measuring, mixing, kneading, baking, slicing, and wrapping. Skilled bakers run the machines, and nothing is left to chance. The ingredients are weighed precisely, the temperature and humidity are closely monitored, and the individual steps of the baking process are carefully timed.

Every bakery uses a special blend of flour, produced by mixing the wheat before or after it has been milled. In most large bakeries the manufacturing process begins in bins on a high floor so that gravity can draw the flour or dough from one machine down to the next.

After a final sifting, the flour is fed into a scale that automatically weighs the right amount and pours it into a mixer on the floor below. Water or another liquid is poured into form dough, and yeast and other ingredients are added. The amount of flour used to make the dough can be affected by the temperature and humidity in the bakery. In addition, the temperature of the water must be exactly correct to dissolve the yeast. The yeast will be killed if the water is even slightly overheated. On the other hand its growth will be stunted by water that is too cold.

In the next step of the manufacturing process, the dough flows into huge troughs that are taken into a fermentation room. It is left there to rise for a set amount of time, usually several hours. Next, a

divider scales the dough into pieces of just the right weight for the baking pans. The rounder shapes the pieces into balls, which then move through the overhead proofer. There the dough rests for a few minutes to recover from the rough dividing and rounding processes, thus ensuring tender loaves.

The balls of dough drop from the overhead proofer into a molder, which shapes them to fit the baking pans exactly. The filled pans are placed in the proof box, where the final rising takes place. The proof box has a slightly warmer and moister atmosphere than that of the fermentation room. The pans then go into an oven, where they are baked at a temperature of more than 400 F (204 C) for about 30 minutes. Low-pressure steam is injected into the oven to prevent the crust from forming too quickly. Most large bakeries use reel ovens or traveling ovens. A reel oven looks like an enclosed Ferris wheel, with the pans of bread on rolling racks. In a traveling oven the pans move slowly on a conveyor belt through a long baking chamber, and the bread comes out the other end. Some traveling ovens measure more than 100 feet (30 meters) in length, and they can bake more than 5,000 loaves of bread per hour.

After the loaves have been slowly cooled, a slicer cuts them into uniform slices. Finally, a wrapping machine places moisture-proof paper around each loaf and seals the paper to keep the bread fresh and protect its flavor. The loaves are then packed into trucks and taken to stores.

The process of making unleavened bread, which is sometimes called no-yeast bread or quick bread, is much simpler than that used for yeast bread. Since the dough contains no yeast, kneading and rising are not involved. The procedure consists merely of measuring and mixing the ingredients and then shaping the dough and baking it.

Bakeries make many products in addition to bread, including rolls, crackers, biscuits, and such pastries as cookies, cakes, pies, and doughnuts. Machines do much of the work in baking these products, as in making bread. Bakers use a variety of devices for molding and cutting and for such operations as making and applying frosting and icing. There are two general kinds of cakes butter cakes and sponge cakes. Butter cakes contain butter or some other fat, plus flour, sugar, eggs, leavening, milk, salt, and flavoring. Bakers make many varieties of these cakes by adding chocolate, molasses, spices, nuts, coconut, or other ingredients. Sponge cakes, such as angel food cakes and similar products, have no fat. They usually consist of flour, eggs, sugar, salt, and flavoring. The eggs provide the

liquid, and the air for rising as well, and cream of tartar is added for lightness and tenderness.

7.2 STRAIGHT DOUGH METHOD

In this method all the ingredients are mixed together, and the dough is fermented for a predetermined time. The fermentation time of straight dough depends on the strength of flour. Strong flours require more fermentation time to mature adequately.

Flours which require 2 to 3 hours for maturing should be used for making bread by straight method. Flours that take very long period for maturing should not be used in straight method because during prolonged fermentation periods it is very difficult to control the temperature of dough and rise in temperature will invariably cause acid taste and flavour in bread. As temperature rise has immediate effect on fermentation speed, it is very necessary to control the temperature of a straight dough by;

1. Using shorter fermentation periods
2. Adjusting the temperature of doughing water
3. By fermenting the dough at optimum (room) temperature i.e. between 78 deg. to 80 deg. F.

When it is desired to ferment a straight dough for longer period, it should be remembered that gluten will soften up to a greater extent and is likely to become sticky, therefore the dough should be made tighter. Yeast content should be reduced but sugar content should be increased in order to provide food during prolonged fermentation. Salt content is increased as it provides stability to the dough and keeps the fermentation speed under control which is necessary during long fermentation period.

(A) Salt–Delayed Method:

This is a slight variation of straight method, where all the ingredients are mixed except salt and fat. As the salt has a controlling effect on enzymatic action of yeast, the speed of fermentation of a salt less dough will be faster, and a reduction in total fermentation time could be affected. The salt is added at the knock-back stage. The method of adding salt at the later stage may be according to the convenience of individual baker. It may be sifted (dry) on the dough and mixed. It may be creamed with fat and mixed.

Whatever way is chosen for mixing the salt, only three-fourth (of the actual mixing time) mixing should be given initially and one- fourth mixing at the time of adding salt. The method is specially suitable if strong flours are to be used for bread making by straight method. Due to absence of salt, the fermentation speed enhanced and gluten is matured in a reasonably shorter time.

(B) No Time Dough Method:

In this method, dough is not fermented in a usual manner. It is just allowed a brief period (about 30 min). for it to recover from the strains of mixing. Since dough is not fermented the twin functions of fermentation (i.e. production of gas and conditioning of gluten) are achieved to some extent by increasing the quantity of yeast (2 to 3 times of original quantity) and by making the dough little slacker and warmer. Although it is possible to make fairly acceptable bread (during emergency) by using this method the product has poor keeping quality and lacks in aroma. Due to absence of fermentation the gluten and starch are not conditioned sufficiently to retain the moisture and there is no flavour because flavour producing bi-products of fermentation are absent. As there is increased quantity of yeast present, the bread may have a strong yeast flavour.

7.3 SPONGE AND DOUGH METHOD

Previously, in this chapter it has been mentioned that strong flours take too long for conditioning and should not be used for making bread by straight dough method. For such flours sponge and dough method is more suitable where the problem of controlling the dough temperature is not so acute as the total fermentation time is divided in two

separate segments. For the sake of convenience and proper identification, a sponge-dough is indicated as 60/40 sponge-dough, or 70/30 sponge-dough, where the first numbers i.e. 60 or 70 indicate the percentage of flour used in sponge and the second numbers i.e. 40 or 30 indicate the percentage of flour mixed at the time of dough making.

In this method, as a first step, a part of flour , proportionate amount of water, all the formula yeast and yeast food are mixed together. Longer fermenting sponges may contain some amount of salt also. Mixing operation is carried out just sufficiently to incorporate all the ingredients evenly. This sponge is fermented for pre-determined time. Sponge fermentation time depends on the amount of flour in the sponge and flour quality. The quantity of flour in sponge depends on the strength of flour. If the flour is too strong , more quantity should be used in sponge and in turn the sponge should be fermented for longer duration.

It is advisable to test the sponge physically for its readiness before mixing it into dough. The following methods of sponge testing could be used;

Take a small piece of sponge and try to break it with both hands. If the piece breaks with a clean fracture the sponge is ready for mixing. If sponge is not ready, the piece will stretch to some extent and will break in unevenly stretched shreds. In such case sponge should be allowed more fermentation time.

Tear the sponge apart from the center with both hands and examine the web structure. If the web structure is very fine, the sponge is ready.

An adequately fermented sponge feels dry to touch without any stickiness present.

When the sponge is ready, it should be broken down properly with formula water, so that its even mixing in the dough is assured. Uneven mixing of sponge in the dough should be avoided as it produces uneven results in the bread. Broken down sponge is mixed with the remaining flour, sugar, salt, fat etc. Mixing operation should be carried out to the right degree. If two different kinds of flour are at hand, the weaker flour should be used at the time of dough making.

After the dough is mixed, it is rested for 30 to 45 min. during which time it relaxes from the stress of mixing operation. Pre-conditioned gluten of the sponge hastens the conditioning process of the gluten of fresh flour during this period and the dough is in perfect state for further manipulation i.e. cutting, moulding etc.

Ferment and Dough Process:

This is a variation of sponge and dough method. Very often a (bread product) formula may contain milk, eggs, substantial quantity of fat and sugar as in the case of sweet bread, Danish pastry and other sweet fermented products. All these formula ingredients will have a retarding effect on yeast activity. If all the formula yeast, part of flour, yeast food and sufficient water (to make a fluid batter as in case of flying ferment) are mixed together, the yeast gets initially an environment which is conducive to vigorous activity and the end of fermentation time (of ferment) it is in a fit condition to take on the extra load of fermentation in the presence of milk, eggs, excessive fat etc. Fermentation time of a ferment depends on the formulation of the product desired to be made and the flavor desired in the product but very often it becomes a matter of individual preference eg. some bakers may take the ferment (for mixing) after it is dropped by itself , while others may take it just prior to dropping and some may allow time even after it has been dropped. A ferment containing milk should be guarded against over fermentation as it will develop more than desirable quantity of lactic acid which in turn will affect the flavour, taste and texture of the product.

When a ferment is ready, it is mixed into dough, along with the remaining ingredients and allowed to ferment for the second stage of fermentation before the dough is taken up for make up. This method is used for making enriched bread, buns, Danish pastry, sweet dough, doughnuts etc. where the speed is very necessary.

Exercise

1. Define the following?

   Q1) Salt delayed method.

   Q2) Straight dough method.

   Q3) Fermented dough method.

   Q4) Sponge and dough method.

   Q5) No time dough method.

Activity:-

a) Visit a nearby bakery or confectionery to study the bread making process.