Chapter-8
Characteristics of a Good Bread

8.0 Unit Overview & Description

- Overview
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8.1 Introduction to Characteristics of a Good Bread

8.2 External: Volume, Symmetry of Shape, Bloom, Crust Colour, Evenness of Bake, Oven Break

8.3 Internal: Colour of Bread, Structure, Sheen and Texture, Flavour and Aroma, Crum Clarity, Moistness, Cleanliness

8.0 UNIT OVERVIEW & DESCRIPTION

Overview:

This unit will make the students understand the characteristics of a good bread. It will also familiarize them with the external and internal factors.

Knowledge and skill outcomes:

i) Learn the external characteristics of a bread.

ii) Learn the internal characteristics of a bread.

Resource Materials:

- Gisslin, *W. Professional baking.* New York : John Wiley & Sons, c1985.
- Sultan, *W. J. Elementary baking.* New York: McGraw-Hill, c1969.
- Sultan, *W. J. Practical baking. 5th edition.* New York : Van Nostrand Reinhold, c1990

Duration: Total Hours 14

Learning Outcomes:

8.1 Introduction to Characteristics of a Good Bread	General Overview
8.2 External: Volume, Symmetry of Shape, Bloom, Crust Colour, Evenness of Bake, Oven Break	• Understand the External Characteristics of a Good Bread • Learn the various factors
8.3 Internal: Colour of Bread, Structure, Sheen and Texture, Flavour and Aroma, Crum Clarity, Moistness, Cleanliness	• Understand the Internal Characteristics of a Good Bread • Learn the various factors

Assessment Plan: (For the Teachers)

Unit-8	Topic	Assessment Method	Time Plan	Remarks
8.2	External: Volume, Symmetry of Shape, Bloom, Crust Colour, Evenness of Bake, Oven Break	Exercise: Question & Answer		
8.3	Internal: Colour of Bread, Structure, Sheen and Texture, Flavour and Aroma, Crum Clarity, Moistness, Cleanliness	Exercise: Question & Answer		

8.1 INTRODUCTION TO CHARACTERISTICS OF A GOOD BREAD

How to Judge the quality of Bread

Most of the commercially produced bread in the country is sandwich type and often top leaved are rarely seen in the market. The reasons for this change maybe many for eg. Non availability of sufficient strong flour to produce open top loaves consumer preference for streamlined square slice of bread continence of bakers in producing sandwich bread convenience in storing sandwich bread and so on.

However for judging the various characteristics and often top bread should be tested as it may not be possible to notice some of the final points of distinction. In case of sandwich bread when lid is put on sandwich bread before baking the expansion of bread during baking operation is restricted, which, in turn , will affect the crumb structure of bread and some other characteristics also. The appearance of an open top loaf will convey quite a bit of information (about its characteristics) to an experience baker while the appearance of sandwich bread may often prove to be delusive. However, in order to make a complete assessment of the quality of bread, it should be examined both for external as well as internal characteristics are as follows:-

EXTERNAL CHARACTERISTICS	INTERNAL CHARACTERISTICS
1. Volume	1. Colour of Bread
2. Symmetry of Shape	2. Structure
3. Bloom	3. Sheen and Texture
4. Crust Colour	4. Flavour and Aroma
5. Evenness of Bake	5. Crumb Clarity & Elasticity
6. Oven Break	6. Moistness
	7. Cleanliness

8.2 EXTERNAL

Volume:

When we see bread, the first thing to catch the eye is its volume. The volume of bread should always be considered in relation to its weight (I.e. specific volume) & for a particular weight of bread; the volume should neither be too big nor too small. Too much volume for the weight of bread indicates too open a texture which entails crumbliness, early staling etc. On the other hand, a small for the corresponding weight of dough is indicative of too close and compact from structure, lack of flavour etc. Factors conductive to acquiring good volume in bread are; sufficient strength in flour, adequate fermentation to achieve proper conditioning of gluten, sufficient diastatic capacity in

flour to maintain gassing power of the dough at the time of baking, proper baking and proofing conditions

Symmerty of Shape:

This is another characteristic of bread (like volume) which will be affected only in the case of open top loaf as sandwich bread is bound to have symmetry of shape (like constant volume). The lower part (trunk) of bread is guided by the walls of the mould, while the other (dome shaped) part has free expansion. There should be such a harmony between these two parts of bread that it presents a pleasing appearance. Even in case of other bread products, i.e. French loaf, Vienna bread, rolls etc., this harmony between its different parts is very important without which the product will present a very poor side. If a piece of dough having (proportionately) more weight is placed in a mould, the lower part will be guided with walls of the mould and will remain as usual but the expansion of the top part will be exaggerated so as to present a non-symmetrical shape. Excess use of bread improvers, too much under or over fermentation, excessive/insufficient proofing, inadequate proofing and baking conditions, are some of the factors which are responsible for imparting round shoulders, caved in sides or bottom, jagged, upper crust, thereby spoiling the symmetry of shape.

Bloom:

This is such a delicate characteristic of bread that it requires a very fine judgment to differentiate it from crust color. Just as a healthy plant or a healthy human being has a different appearance from unhealthy ones, so is the natural bloom of the bread different from artificially acquired shine. If a bread having natural bloom is kept besides bread having artificial shine (acquired by brushing with fat), the difference can easily be made out. The bloom is that natural flush which can be acquired in bread only by the use of good raw material and proper care in each and every stage of processing.

Crust Colour:

Crust of bread is supposed have a pleasing golden brown color. Since caramelization of sugar is responsible for imparting such color to crust, the intensity of color will depend on the quantity of sugar available for caramelization at the time of baking. Yeast also

requires sugar for gas production. Therefore, availability for sugar for caramelization is influenced by the activity of yeast during fermentation time. For whatever reason (such as slack dough, lack of salt, high temperature of fermentation room etc.) , if more sugar is consumed by yeast during fermentation time , the crust color will be pale or light brown . Conversely, if there is lack of yeast activity (as may happen in case of insufficient fermentation time , stiff dough , excessive salt content, chilling of dough etc.), there will be more sugar left in the dough which will make the crust color reddish brown (foxy red , harsh brown) that is again not very pleasing to the eye apart from over or under fermentation, some other factors also influence crust color such as proofing conditions, oven temperature, milk content of the formula, type of bread improvers used, consistency of dough, diastatic activity of flour, amount of bleaching flour is subjected to etc.

Evenness of Bake:

Bread should have even golden brown crust color all around. Since the top crust remains in direct contact with hot air, it will naturally acquire slightly darker color, but this darkness of top crust should be in consonance with the color of the remaining crust. In case of single bread mould (as against striped set of moulds) are used in bakery, bred is likely to have uneven crust color If the moulds are set in the oven too close to each other in that case, the side of the bread which is in close contact with the other mould will not get proper color as there is no gap in between for circulation of heat. Precisely, for this reason the moulds should be set in oven half an inch apart and parallel to each other in order to allow free and even flow of heat. In ovens also there are likely to be hot and cold spots. In that case too, bread will have an even crust color. Over fermentation or oven proofing will create a condition where large gas pockets will remain entrapped between walls of the mould and body of bread. In that case the whole body of bread will not remain in touch with the mould and heat absorption will be uneven and crust color will also be uneven.

Oven Break:

When an open top loaf is being baked, crust formation on the side and top of bread takes place earlier while there is still no crust formation on the portion of the bread which is

nearest to the upper edge of the mould. When the expansion takes place in the inner part of bread, the gas stretches this weaker part and escapes through the opening thus created. This is called break. At this break, stretches and coagulated gluten strands could be clearly seen. The characteristics of the break are known as shred. If the flour is of good strength, dough is correctly fermented, proofing and baking conditions are proper, and then the break must be smooth which is invariably a sign of good bread. It has been discussed earlier that the gluten of dough should be so conditioned during fermentation that it could stretch with expanding gas & still have sufficient resistance to retain gas. It is the adequate balance between these two conditions which come from proper fermentation and which is responsible for giving a smooth break. If the dough is under fermented, the gluten will have more resistance & it may tear apart under pressure for expanding gas giving an exaggerated break or even a shell top. Conversely, if the dough is over fermented, there will be no resistance left in the dough and there will be blind appearance that is there will be no break. Apart from proper fermentation the bread shred is also affected by correct moulding, adequate proofing and sufficient humidity in the proofing room and the oven.

8.3 INTERNAL

Colour of Bread:

Obviously the internal color of bread will be influenced by the grade of flour but it is also true that the different batches of the bread made from the same flour may have different internal color. This is so because the visual effect of whiteness of bread crumb is decided by the amount of light reflected form the crumb surface. If more amount of light is reflected from the crumb surface, the crumb will appear whiter while if the crumb surface absorbs more light and very little is reflected result will be darker appearing crumb. A crumb structure made up of small even sized, oblong and shallow gas cells will reflect more light in comparison with another crumb which has a structure made up of uneven sized, deep and round shape cells because in this case lighter will be absorbed by the crumb and reflection will be very poor. If the cell walls are thin, a part of light falling on a cell will be passed through into the neighboring cell and the intensity of reflected light will increase thereby enhancing the visual effect of whiteness of crumb. Bread having thick cell walls will not allow this refraction of light into the neighboring cells and

the crumb will appear to be comparatively darker. Factors which influence the crumb structure are quality of flour, degree of fermentation, manipulation of dough , proofing and baking conditions .

Structure:

If the crumb structure of different kinds of bread products is closely observed, it will be seen that shape and size of gas cells varies considerably eg. Regular white bread will have oblong shaped small gas cells which are evenly distributed throughout the crumb, while a French loaf will have round gas cells of un even size an un evenly distributed in the crumb. In case of whole meal (brown) bread, the gas cells will be very small due to presence of bran which has a cutting action on gluten strands thus preventing them from stretching. Structure of different kinds of bread products must vary due to difference in formula, fermentation, manipulation, baking conditions and so on. For eg. , healthy type products are made from strong flour , lean formula is used , makeup is of different kind and baking is done on a flat surface without a support of a mould which will result in a structure having round , uneven size and unevenly distributed gas cells . While in case of white bread, although same strong flour is used, but the formulation, makeup, proofing and baking conditions are different which produce a structure having even sized, oblong gas cells. But the structure of similar kind of product will be influenced by the quality of raw material, degree of fermentation, manipulation of dough and proofing and baking conditions. Slack dough will produce bread having open structure and large holes while tight dough will produce bread with close structure.

Sheen and Texture:

If the crumb structure of bread is made up of small , oblong , shallow and evenly distributed gas cell having thin cell walls , the cut surface of the bread slices will not only appear bright but will also appear to be full of small sparkling objects which is nothing but increase intensity of reflected light due to thinness of cells walls . This characteristic is known as sheen. If a cut surface of bread slice is gently pressed with fingertips, the sensation could be that pf smooth silkiness (like velvet) , or hardness (like a drum) , or coarseness (like jute bag) and so on . This sensation of touch is known as texture of bread. The texture which is soft, silky and still with certain degree of firmness is considered to be good. a slack dough or too much final proofing will produce a bread having open crumb

structure which will be soft to touch but will be coarse . Such texture is known as wooly. Excessive tightening action on flour proteins as in the case of too much milk in the formula or high level of potassium bromate will produce bread with such a compact crumb that it will appear almost like a block of cheese. This is known as cheesy texture. Bread made from under fermented or too type dough will have a texture which is very tight, hard to press and rough, known as dummy texture.

Flavour and Aroma:

Taste of any bakery product could be fully appreciated only when it is accompanied by matching flavor. A cake or cookie or bread product cannot be enjoyed if there is no flavor present. In case of bread, a no. of acid and other byproducts are produced during fermentation time. When these acids etc. come in contact with heat during baking, they impart special flavor to bread. Therefore the byproduct of fermentation has a major role to play in deciding the flavour of bread. If dough remains under fermented, there will not be enough by-products present and consequently bread will lack in aroma. On the other hand, over fermentation will produce excessive quantities of acids etc. and the flavour will be too strong (nourish) sometime termed as gassy. High temperature of dough during fermentation or too much temperature. In the fermentation room will produce acidic flavour. Excessively long fermentation period will produce a flavour similar to that of rancid butter. Some of the ingredients used in bread making, also, either impart flavour to bread or enhance the natural flavour of other ingredients thereby improving the overall flavour of bread. Such ingredients are salt, sugar, malt and milk. Slat is one ingredient which exerts a considerable influence on the flavour of bread therefore, optimum quantity of salt should be used in bread formula.

Crumb Clarity and Elasticity:

When a thin slice of bread is held against bright light, the whole surface should appear translucent. But at times dark spots are likely to be seen through which light will not pass. Such a dense spot feels hard t touch and is known as core. Improper mixing of dough is a major cause for having course in bread. Scrapping of dough (connected from table, mixing bowl etc.) should be properly mixed with the rest of dough before it is set for fermentation. If dough has crusted at fermentation or makeup stage, this crust will get

folded during moulding operation and will form hard cores in the crumb. Dense layers in the crumb structure are known as seams. If a fully extended loaf is mishandled while placing it in the oven, some portion of web like structure may collapse resulting in the formation of seams. When the crumb of bread is pressed (gently) , it should not break and when the pressure is released , it should come back to its original shape . This quality of bread is called as elasticity. If bread does not have the quality of elasticity, the pressure of slicing blades will break the crumb rather than cutting it in neat slice. Such a bread slice will not be easy to butter also, as a pressure from butter knife will also break the crumb. Good quality flour and adequate fermentation are the important factor which influences the elasticity of bread.

Moistness:

Quality of freshness of bread is just by the degree of its moistness. Moistness is influenced by the condition of gluten and starch in the bread. Bread may contain more amount of moisture and still be divide the quality of moistness. If the gluten is adequately conditioned during fermentation stage, it will form a very fine web like structure having thin cells walls thereby enhancing the moisture holding capacity of bread. Similar, the proper conditioning of starch which is influenced by the action of diastase enzyme will also improve the moisture holding capacity of bread. Some of the bread making ingredients e.g. Salt, Fat, Sugar, Malt help in retaining moisture in bread. If the bread is baked at low temp. it will have to be baked for longer time which will result in evaporation of more moisture from bread . A bread store should have relative humidity of about 60%. Lack of humidity will rob the bread of its moistness.

Cleanliness:

This is such a characteristic of bread which is hardly, is ever, and has any bearing with quality of raw material, or inadequacies during processing. Cleanliness of the products depends on the care a baker takes in handling the production. All the labor put in producing good bread maybe wasted if the baker is not careful in handling the finished product. Absolute care is necessary during baking, depanning, cooling, slicing and packing operations as these are the stages when bread is likely to lose its quality of cleanliness. No object, which is not absolutely clean, should ever be allowed to come in

contact with the product. It is the sacred duty and social obligation of a baker to maintain perfect standards of personal hygiene as well as cleanliness of his establishment.

Exercise

Activity:-

Q 1) Write the components of flour along with their percentages?

Q 2) Define the following?

a) Gelatinisation

b) Gluten