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B R E A D M A K I N G .

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R E F E R E N C E S .

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Conn's Yeasts and Moulds in the Household.

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It may be said that there is no other food, with the single exception of milk, which is so universally used as is bread. By bread we may include any food made from flour or meal by moistening, kneading and baking. According to early historical records bread has existed in some form or other for centuries past. It is true that the bread used by the Indians which inhabited our country in the early days, did not, nor does that used by the uncivilized man of this age very closely resemble that used by the civilized man of this age. Yet they knew no other so were perfectly contented with what they had and it filled the same place to them then which our bread now fills for us. And because of its importance in the diet much more care should be taken with it than is usually done.

Again considering it from a dietetic standpoint it is the most nearly perfect food of any of the ordinary foods unless it is milk. In many places where other articles of food are difficult to obtain bread is almost their only food, in this case it usually consists of ground wheat or millet moistened in water and baked.

Though it seems hardly possible it is nevertheless true that the civilization of any district may be judged by the bread made in that district. Primitive man had the very most simple bread making methods, while from time to time new methods have been discovered and improvements are constantly being made as civilization advances, in the process and results of bread making and bread baking.

Bread has a great value as an economic food being one of the cheapest if not the cheapest way of supplying the proper nourishment to the body.

Bread has a chemical composition as follows:

Water	38.51.
Nitrogenous Substance	6.82.
Fat	0.77.
Sugar	2.37.
Carbohydrates (starch etc.)	49.97.
Woody Fibre	0.38.
Ash	1.18.

The loaf of bread made from

2/3 c milk,
2/3 c liquid yeast,
1 tblspn sugar,
1 tspn salt,
1 lb. flour

weighs about 1-1/2 lbs., and costs three (3) to four (4) cents according to cost of materials. Bread being so nearly a complete food in itself it requires but little added fat to make it an article of diet from which we may obtain all of the nourishment and in the correct proportions necessary to the body.

Bread is usually made from very simple ingredients such as yeast, flour and water yet the change which it is necessary that these ingredients undergo before a finished product is produced is most complicated.

Bread may be made which contains only flour, water, yeast and salt; while this is entirely possible and is sometimes used yet usually other articles such as milk, sugar, shortening, eggs etc., are usually added to produce different kinds and qualities of bread.

Yeast.- This being one of the most important articles in the preparation of bread it is well to know something of the varieties,

their sources and relative merits. Yeast in some form or other has been found for ages existing in the air as is proven by the fact that malt substances exposed to the air are soon observed to show alcoholic fermentation which must in all reason be due to yeast. Such yeast as this is used in the so-called salt rising and is known as wild yeast.

The yeast plant is a simple one celled organism without color. It multiplies by cell division or budding. These processes take place so rapidly at times that the plant may be thought to grow in colonies. For baking purposes three commercial varities of yeast are in use, namely the Brewers, Distillers compressed, and what is commonly called patent yeasts. This last one may be further divided into the malt or hop yeast and the Scotch flour form. The method of preparing the distillers compressed yeast will be given here as it is an extensive process and includes most of the other processes. It may be prepared from barley, rye, maize, rice etc., depending upon the cost of the proteid materials. For this reason rice is seldom used. The grain is first malted thus making it more easily amenable to diastasic action. It is at this time that diastase is developed, the whole of the mitrogenous matter being rendered more soluble and in part peptonized. The grain is then passed to the mills where it is reduced to a fine meal. The next step may be designated as the preparation of a ferment. This is a preliminary fermentation of a relatively small proportion of the grain. Malt and rye are taken together for this purpose and mashed at a convenient temperature so as to convert as much as possible of the starch into maltose. This then stands in the tubs at a temperature of about 35 deg. C (The most suitable temperature for lactic acid production.) The acid thus formed-

prevents the excessive formation of lactic acid in the yeast at some future time. The raw grain is first cooked by high pressure steam until thorough gelatinization has been produced. From this vessel it is next passed into the saccharification tun and there mashed first with rye after which malt is added and saccharification is continued until hydrolysis of carbohydrates to maltose is as complete as possible. The finished wort is next passed to the refrigerators and cooled after which it is washed several times, though care must be used not to wash it too much. At this stage starch is added or not as desired, though it is in many cases used without starch being added.

The compressed yeast is probably the best for use when it is easy to obtain it fresh. But in the rural districts this becomes almost impossible due to the fact that it so soon deteriorates; in fact the yeast plant soon dies out. Thus the rural consumers are in a measure compelled to use the so-called patent yeasts; of these the hop yeasts are most common. In using these patent yeasts it has been found that a much quicker and more satisfactory process of bread making is obtainable by first making a "liquid yeast". Either of the two following methods are good; the latter does not keep so well in warm weather. In either case it should be kept as cool as possible. Kept on ice is to be preferred.

No. 1.

4 Medium sized potatoes;
1 quart water;
4 tblspns sugar;
1 tblspn salt;
1 cake yeast.

Grate the potatoes into boiling water to which has been added the salt and sugar. Cook until clear, then cool to 30 degrees C. and add yeast which has been soaked in 1 cup luke warm water. Allow to

ferment and stir down three times in twelve hours; put in sterilized, covered jars until needed for use.

No. 2. Dick Bennet's Yeast.

9 good sized potatoes;
2 tblspns salt;
1/2 c sugar;
Water in which to cook potatoes;
Sufficient flour for batter;
1 yeast cake or 1 c liquid yeast.

Boil potatoes in enough water to more than cover them, drain and save water. Mash potatoes, return to the water and add sugar and flour and cook until thickened; when cool add yeast cake in 1/3 c luke warm water. Proceed as in previous recipe.

In using either of these recipes it should be remembered that the yeast thus made will be active for only about two weeks after which time it is not advisable to use it. This liquid yeast may be used in varying quantities from 1/3 of a cup to the entire amount of the liquid used for the bread and the rapidity of the raising of the bread depend upon the amount used as well as the fresh condition of the yeast.

A very satisfactory proportion to use is 2/3 cup liquid sterilized, 2/3 c yeast, 1 tbspn sugar, 1 tspn salt. About 1 pound flour though the amount of flour varies greatly with the kind. In the case of some of the harder wheats it runs about 14 ounces to the above amount of liquid. When baked a loaf of bread made from these ingredients weigh practically 1-1/2 lbs., and requires from 7 to 8 hours from time of setting sponge to complete the baking. As before stated bread may be made from yeast, water, salt and flour or meal. But usually some other ingredient is added as the increased taste and appearance more than repay for the trouble and expense.of the other

articles added. Sugar is probably the chief one. This when added in small quantities is beneficial to the yeast plant as it furnishes some ready material for food for the yeast. When added in the proportion of 1/2 c sugar to 1 c liquid it retards the growth of the yeast plant quite noticably while in a pure sugar solution it does not grow at all.

Another much used ingredient is milk and it would undoubtedly be used more often if its value was fully realized. It improves the appearance and texture and shortens the length of time necessary for bread making. Also increased the nutritive value of the bread. Whey has its advantage over water. It makes bread of better texture than water but still is not as fine grained as that made from milk. Butter when added in small amounts seems to be beneficial; it gives bread better texture and crumb. But as sugar is added in excessive amounts it retards the growth of yeast. Eggs may be added; when added they seem to make a spongey loaf larger in size but seemingly of as good texture as that made without the addition of eggs.

Length of time of fermentation has much to do with the texture of the bread usually that having the longer period of fermentation being of a better texture; especially is this true of hard wheat flour as it makes the bread softer; of course if this is carried too far it becomes porous. The best method seems to be that of sponge dough and dough cut down once before being put into the pans. In reality this takes but little longer as it raises so much more rapidly the last time than when it is not cut down.

Again an excessive amount of kneading is unnecessary; the flour simply needs to be <u>well</u> mixed with the other ingredients. The bread made with the universal bread mixer and mixed but five minutes

had the same appearance and texture as that made in the ordinary method and kneaded 20 minutes by hand. The scalding of a small amount of flour seems also to improve the texture; about 4 tblspns to the loaf being the best amount as this amount can be thoroughly scalded and a larger amount cools the liquid too much.

Lastly but by no means least is the process of baking. This is one of the most important steps for no matter what care has been taken in preparing the bread if poorly baked it is spoiled.

The loaf of bread which weighs about 1-1/2 lbs. should be baked from 50 minutes to 1 hour in a hot oven, temperature 400° F.

EXPERIMENTS.

I.

Ingredients .

1-1/3 cup water (sterilized);
1 tblspn sugar;
1 tspn salt.
8 grams compressed yeast.
16 ounces flour.

Method used.- Sponge, dough.

Temperature 28° C.

Length of time required 8 hours.

Bread needed more fermentation before being made into loaf.

II.

Ingredients.

Same as in I except that 1/3 c liquid. Yeast was substituted for 1/3 c water and compressed.

Method used same as in I.

Length of time 7 hours.

Better than previous loaf but not enough fermentation yet.

III.

No.1. Ingredients same as in II.

No.2. Ingredients same as in II except there was no sugar in this. The amount of flour was also lessened 1-1/2 oz.

Method same as before.

Temperature 26° C.

Length of time No. 1, 7-1/2 hours.

No. 2, 8 hours.

No. 1 decidedly the best bread, better taste, texture and appearance.

IV.

Ingredients same as before except 1 c whey was substituted for water.

Method same as before.

Temperature 27° C.

Time required 7 hours.

Bread better texture than that made from water.

V.

Ingredients same as IV except milk substituted for whey.

Method same as before.

Temperature 26° C.

Length of time 6-1/2 hours.

Bread of better texture and color.

VI.

Ingredients same as in V except 2/3 c milk being used instead of 1-1/3 milk and 1/3 c yeast.

Method same.

Temperature same.

Time required 5-1/2 hours.

Bread about same as in V.

VII.

Ingredients same as in VI except yeast and milk. This time used 1 cup yeast, 1/3 cup milk.

Method same as before.

Temperature 27° C.

Time required 5-1/4 hours.

Bread resembled bakers bread more than did the other.

VIII.

Ingredients same as before except 1-1/3 cup yeast being only liquid.

Method same as before.

Temperature 26°C.

Time 4-3/4 hours.

Did not taste or smell of yeast.

IX.

Ingredients

2/3 c yeast.
2/3 c milk.
1 tblspn sugar.
1 tspn salt.
15-1/2 ounces flour.

Method - sponge rise, fall, rise again.

Temperature 28° C.

Time required 8 hours.

Bread of sweter taste than that of less fermentation.

X.

Repeated IX cutting dough down after it had raised once.

Temperature same.

Time required 8 hours 10 minutes.

Bread softer and sweeter to taste.

XI.

Ingredients same as in X.

Method, boiling milk poured upon flour for sponge. Proceeded as before.

Temperature 26°C.

Time 5-1/2 hours.

Appearance good.

XII.

Experiment X1 repeated with the difference in the amount of flour scalded being changed from 2 c to 2 tblspns.

Temperature 28° C.

Time 5-1/2 hours.

Better texture that is a little more soft.

XIII.

Experiment XII repeated changing amount of flour to be scalded to 4 tblspns.

Temperature, time etc., equal with XII.

Bread has same appearance as previous loaf.

XIV.

Ingredients same as XIII.

Method dough.

Temperature 26°C.

Time 5 hours.

Bread not as soft as when made with sponge.

XVI

Ingredients same as before plus 1/4 c butter.

Method sponge dough.

Temperature 27° C.

This amount of butter did not effect the length of time in rais-

ing. Bread is of better crumb than any previously made.

XVII.

Same as previous one except twice the amount of butter was added in this one, the bread did not raise so rapidly nor as much as before as the fatwas sufficient to retard the yeast growth.

XVIII.

Effect of eggs on bread. Sponge made as before with the addition of 2 eggs. 4 oz of flour more than had previously been used were required. It required about the same length of time as before. The texture was good. Eggs do not seem to have changed or retarded it in any way. But the eggs would of course increase the nutritive value of the bread.

XIX.

Ingredients
1-1/3 c milk.
1-1/3 c liquid yeast.
2 tblspns sugar.
2 tspns salt.
30 oz flour.

Method used, the Universal Bread Mixer, turning 5 minutes, with sponge then dough.

Temperature 27° C.

Length of time 6 hours.

Bread appeared the same as that made in the same manner and kneaded 5 minutes.

This amount had to be used as smaller amounts could not be stirred with bread mixer.

XX.

Salt rising bread (Recipe tried).

1 c milk.
1 c water.
1 tspn salt.
2 level spoons graham flour.
Wheat flour as needed.

Milk 100° F., water 110°F. Make batter including first four ingredients and part of wheat flour, put in pitcher and keep very warm. When light add flour to make dough. Let raise once make into loaf and bake.

Tried this starting it early in the morning; let it stand all day but it did not raise; probably no wild yeast germs in the mixture.

XXI.

Same as XVIII leaving out the eggs and sugar and using gluten flour instead of white flour.

Temperature 26°C.

Length of time 5 hrs 30 min.

Bread was bitter; probably due to peptonization of proteid by the yeast. (This flour contained 13.2% crude protein.)

XXII.

Quick process - tried using

1 c yeast.
1/3 c water.
1 tspn salt.
Gluten flour.

Method make into loaf at first, let raise and bake.

Bread still bitter same as previous time.

XXIII.

Whole Wheat Bread. - Started sponge same as in previous cases using 2 c white flour, then making dough by adding whole wheat flour.

Temperature 27° C.

Time required 6-1/2 hours.

Texture good.

XXIV.

Repeated experiment XXIII adding rye flour instead of whole wheat. Texture good.

XXV.

Effect of potatoes on bread. - 4 loaves were made; in one ; grated scalded potato was added, in another potato water, in the third mashed potato, in the 4th liquid yeast the only liquid used; in all cases the bread was porus and looked like cooked starch. The flour used was Manhattan No. I.

XXVI.

Experiment XXV repeated using Purity flour; the bread was improved in appearance and texture.

XXVII.

Made bread from 1-1/3 c milk,
1 cake compressed yeast,
1 tblspn sugar,
1 tspn salt,
15 oz flour.

Saved 1 cup of sponge to use next time in place of yeast.

The bread made from this sponge was slow and was sour. Probably the milk was soured in the sponge which was used as yeast.

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