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**BOYS' AND GIRLS' INDUSTRIAL CLUBS**

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# Oregon Agricultural College

**EXTENSION SERVICE.**

RALPH D. HETZEL, Director.

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## ESSENTIALS OF BREAD MAKING.

•By HENRIETTA W. CALVIN.

*Bread like a garden crop.*

Every person who grows a garden knows there are certain conditions absolutely necessary if his garden is to be a success. He knows he must have a suitable soil, good seed, and enough moisture and heat. Besides all this he must work the garden right, and harvest the crop when it is just at its best. So the gardener selects his soil with care, secures vital, pure seed as free from weed seeds as possible, and studies the needs of his plants as to moisture and warmth.

The bread maker is a gardener; but her soil is flour and her seeds are yeast plants. She adds milk or water to supply moisture, regulates the warmth, cultivates her crop by kneading, and harvests by the use of a good oven.

*Flour from Soft or Hard Wheat.*

There is in wheat a substance called gluten. It is because wheat flour has this gluten in it that we can use it to make light or raised bread. Hard wheat has a very strong elastic gluten in it while soft wheat has a gluten which is not so elastic, and which differs in other ways also. Hard wheat grows in cold hard climates and when it is taken into milder climates and a different soil it gradually changes to soft wheat.

Winter wheat is the kind that is planted in the fall, lives through the winter and grows again as soon as the weather becomes mild. Spring wheat is planted in the spring time. Winter or spring wheat may be either soft or hard.

Flour is powdered grains of wheat. The outer coats of the wheat are there to protect the wheat germ from injury, and are not valuable as human food. Usually the miller removes these outer coats and sells them to the farmer for cattle feed.

Sometimes the outside coarse covering is left in the flour, which

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is then called "Graham" flour. If this rough layer is removed and the portion of the wheat kernel that remains is ground, the product is spoken of as "whole wheat" flour. Fine white flour has none of the outer coverings of the wheat left in it.

Hard wheat flour has much tenacious gluten in it. When it is made into a dough the dough will stretch. That means that a loaf of bread made from a pound of hard wheat flour will stretch to a larger size than the loaf from a pound of soft wheat flour.

NOTE:—(Take a half cup of flour and make it into a stiff dough with a little water. Let it stand a few minutes, then knead it under water until all the starch is washed out. If it is hard wheat flour you will have a ball of gum-like material. This is gluten. Put it on a little pan and bake it. See how it puffs up. There is air in the mass and when it becomes hot the air swells but the gluten stretches and holds it in. If the flour you have been trying is made from soft wheat, you will find that the gluten breaks quickly when you try to pull it.)

Good bread can be made from either good hard wheat flour, or good soft wheat flour, but you should know which you are using because they require different treatment.

Hard wheat flour may be made into a soft dough, and if it is very hard wheat then the bread should be kneaded down several times.

Soft wheat flour should be made into a very stiff dough and the bread will not need to rise more than once before it is put into the pans.

Poor flour may result from diseased wheat or unfavorable climatic conditions during harvest. Sometimes it is the miller's fault but not usually. If the grocer or the housekeeper stores the flour in a damp or mouldy place the flour will not make good bread. The flour is the bread maker's soil. She should be sure that it is good and should keep it in a clean, warm, dry place until she is ready to use it.

### *Yeast.*

Yeast is really a tiny plant which grows wild on fruits in the summer time. There are a number of varieties of yeast, but not all are good in bread making. The so-called "dry yeast" on the market is made by taking live, growing yeast plants and drying them after mixing with corn meal. When *dry yeast* has been kept a long time many of the yeast plants die. Sometimes the corn meal used in making the dry yeast contains many micro-organisms which cause sourness. So when dry yeast is used as seed in our flour soil, the seed may be dead or it may have many "weed seeds" in it. If these conditions exist, we do not get the crop we want; but our results are heavy, sour bread.

*Home-made yeast* is much better than the dry yeast. It can be likened to the seed saved by a good gardener from his own healthy

plants. When properly prepared it contains millions of live, growing, microscopic plants. Liquid yeast can be kept in a cool, dark place about two weeks.

*Compressed yeast* is a mass of live, growing yeast cells which have been mixed with enough starch to hold them in shape. We may liken dry yeast to a package of tomato seed bought at the grocery. They may have been kept in the store until dead; they may be alive. We can not tell until we plant them. *Liquid yeast* is like the hot bed of young growing plants which we have grown from the package of seed purchased. *Compressed yeast* can be compared to live plants purchased at the florist's which must be planted immediately or they will die. If bread makers are where they can obtain fresh compressed yeast, they will find it easiest to work with and to secure uniform results.

#### *Liquid Used in Bread Making.*

Sweet milk is the best of all liquids for bread making. It should be scalded and then cooled. The micro-organisms that cause sourness in milk are thus heated until they all die. Milk bread will be a little yellow but its flavor is better and it is more nutritious than water bread. Water may be used instead of milk, however, and good bread can be made with it.

Scalded butter milk or whey may be used and either one will make a good bread.

Potato water, which is the water poured off of cooked, pared potatoes, is often used; but if a potato yeast is used the two together may make the bread a little damp and dark.

Scalding hot water or milk should never be used, for it makes damp, clammy bread that never has a fine texture. Flour is always injured by scalding.

#### *Sugar and Salt.*

Sugar is a good yeast food. A little added to the bread does not affect the flavor of the bread but does quicken the action of the yeast. Salt is used for flavor. Such a small quantity as is used in bread does not materially retard the growth of the yeast but does whiten the bread.

#### *Temperature.*

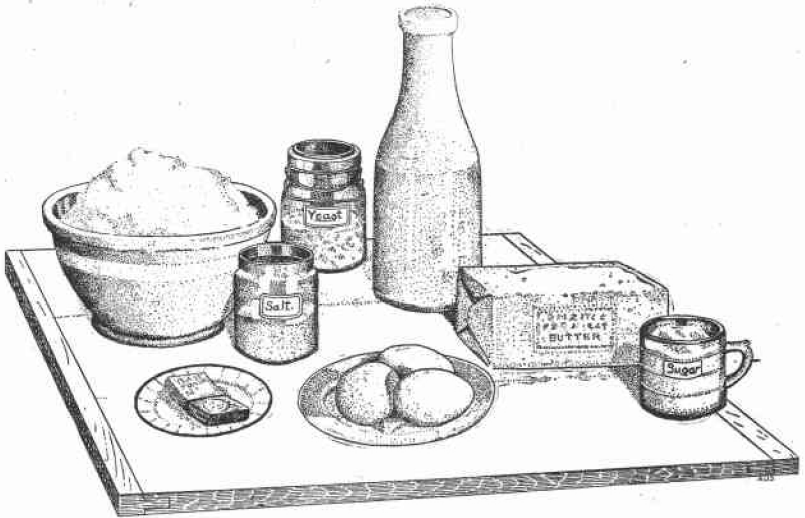
Bread while rising must not be kept too warm. More bread is spoiled by too much heat than by too little. Bread that feels warm to the hand is too warm. The bacteria which cause sourness, and are to the bread baker as weeds are to the gardener, grow rapidly in the dough if it is quite warm.

#### *Oven for Baking Bread.*

An oven should be clean and evenly heated. A temperature of 380° F. is necessary in bread baking. An oven thermometer costs

from 65c to \$1.25 and is a great convenience. By the time the bread baker, without a thermometer, finds that her oven is too hot or too cold the bread may be spoiled.

If you have no oven thermometer then open the oven door and hold your hand in the oven while you count fifteen. You should count one count a second. If the oven is too hot you will have to withdraw your hand sooner; and if it is too cool, you will willingly hold your hand in longer than the time required to count the fifteen. A piece of writing paper will become a delicate brown in five minutes in an oven of the right temperature for baking a loaf of bread.



Materials Used in Bread Making.

### *Directions for Bread Making.*

#### YEAST:

- 4 medium sized potatoes, washed and pared.
- 1 quart rapidly boiling water.
- $\frac{1}{4}$  cup of sugar.
- 1 teaspoon salt.
- 1 cake dry yeast soaked in  $\frac{1}{4}$  cup lukewarm water.

Grate the potatoes into the boiling water and boil about five minutes. Add the salt and sugar and place to cool. When lukewarm add the soaked yeast and set away in an earthen jar or crock. Let this yeast ferment for 24 hours, when it will be ready to use. Take out 1 cup-full for a baking of bread and put the rest into a glass jar, cover, but do not screw the lid down tightly. Put in a cool, dark place.

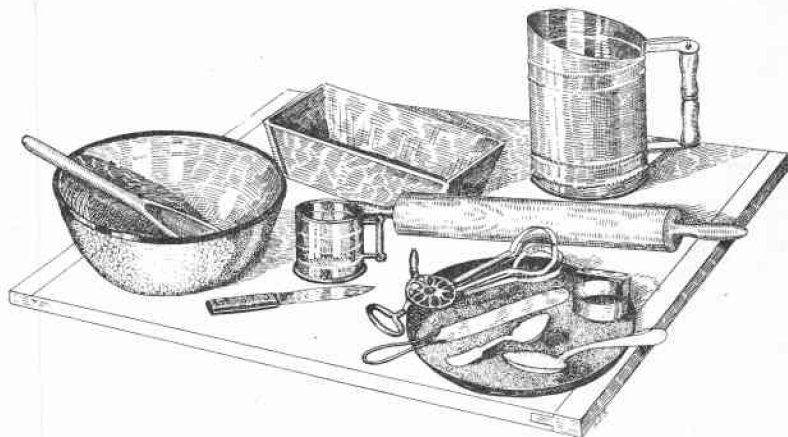
*Bread.*

For four loaves:

- 1 quart of scalded and cooled milk or water.
- 1 cup of the liquid yeast.
- $\frac{1}{4}$  cup of sugar.
- $1\frac{1}{2}$  level tablespoons salt.
- Flour enough to make a dough.

*Directions:*

When the scalded milk or water is lukewarm add the sugar and yeast. One-fourth cup of melted shortening may be added if desired. Have the flour sifted and ready. It should be as warm as the room and in winter it is well to set it near the stove until the chill is taken off.



Utensils Used in Bread Making.

Into the liquid, containing sugar, salt and yeast, put about one and one-half quarts of flour. Stir and then beat until there is a perfectly smooth batter. Keep adding a little flour at a time and beating hard until the dough is too stiff to work with a spoon.

Have a perfectly clean bread board, spread over the center of it some flour and turn out the dough onto this. Scrape out the bowl perfectly clean and fill with cold water to soak.

Now begin to knead the dough. Lift from the edges and press into the center, keeping the dough as near the shape of a date seed as possible. Add the flour slowly and knead until the dough no longer clings to board or to the hands. If the bread-board becomes sticky while working, scrape clean, re-flour and knead the scrapings into the bread. If the hands become sticky, stop work and wash and dry them.

When the dough is smooth and velvety put it into a clean greased bowl and cover tightly with a plate or tin lid. If the bread

is not covered this way it will form a hard crust that will leave heavy spots in the bread after baking. Put the bread out of any draft but not close to the stove. If hard wheat has been used it will be well to knead the bread down when it becomes light, but if soft wheat is used it should be shaped into loaves as soon as it has risen. How shall you tell when it is light enough? Push a spoon handle to the bottom of the bowl and then withdraw the spoon. If the dough has risen enough it will slowly fall around the hole. Bread does not require kneading when shaped into loaves, nor should additional flour be used.

Place each loaf in a separate pan and let rise until double its size; then bake. It should be a light golden brown at the end of 15 minutes and must bake steadily one hour. When taken from the pan turn it onto a wire rack, if possible, and cool before putting away. When the bread is cold score it by this card.

*Score Card.*

<b>BAKING—</b>	
Thoroughness .....	20
Color .....	12
(Shade 6, Evenness 6)	
Shape .....	8
<b>TASTE—</b>	
Sweetness .....	25
Flavor .....	15
<b>APPEARANCE OF CRUMB—</b>	
<b>TEXTURE</b>	
Quality .....	8
Fineness .....	4
Evenness .....	5
Color .....	3

*Faults.*

If your bread has little burned blisters on top your oven was too hot at first.

If it is golden brown some places, as it should be all over, but is too brown or too white other places, you have a poor oven and if you must use it change your loaves around in the oven about once every ten minutes.

If your loaves run over at the sides, either your dough was too soft or your oven too cold. Try to correct this fault the next time you bake.

If your loaves crack and one side rises much higher than the other, your dough was too stiff or your oven has uneven heat from the top and sides. Watch next time and see which causes your trouble.

If the bread is sour one of several things may be the trouble. Was it too warm while rising? Did it stand too long before baking? Did you have poor yeast?

Coarse holes may be caused by the bread rising too long or by the dough not being stiff enough or by the oven being too cool and the bread rising too much while it is in the oven. Of course good bread must be thoroughly done.

#### *How Much to Bake.*

The recipe given makes four loaves, but that is too hard for little hands to handle so the little girl had best just bake one-quarter or one-half as much as the recipe calls for.

#### *New Yeast.*

When almost all of the yeast made has been used make a new supply, using the last of your own yeast as a "starter" instead of the cake of dry yeast.

#### *Graham Light Bread.*

When graham flour is used it is best to use one-half white flour and proceed as for ordinary white bread.

#### *Whole Wheat Bread.*

With whole wheat flour, the bread may have either one-fourth white flour added or the entire quantity may be of whole wheat flour. The bread may be made by the white bread recipe. Many people prefer to add an extra one-fourth cup of sugar to the dough.

#### *Steamed Brown Bread.*

- $\frac{1}{4}$  cup whole wheat flour
- $\frac{1}{4}$  cup corn meal
- $\frac{1}{4}$  cup graham flour
- $\frac{1}{4}$  teaspoon salt
- $\frac{3}{8}$  teaspoon soda
- $\frac{1}{2}$  cup thick sour milk
- $2\frac{1}{2}$  T molasses

Mix the dry ingredients thoroughly. Mix the sour milk and molasses. Stir in dry ingredients, beating thoroughly. Turn into a well-buttered one-pound baking powder can. Cover tightly and steam two hours. Remove cover; dry in oven 15 minutes. Take from can and slice with a string.

## CAKE MAKING.

Cake is really but a modified bread and in times past was made with yeast, but now we seldom make a cake with yeast as the leavening agent. There are two general types of cakes and they are known as "sponge" and "butter" cakes.

#### *"Sponge Cakes."*

All varieties of angel food cakes, lady fingers, and sponge cakes are classed together under this one head. They have certain similar-

ities; none contain any butter or other fat, all are made light by the expansion of air caught into the beaten egg, and all have a decidedly large quantity of eggs. Because there are so many eggs in these cakes and so little else, they must be cooked *very* slowly.

*Faults* in these cakes are almost always due to too rapid baking in too hot an oven.

### *Sponge Cake.*

- 10 egg whites
- 7 egg yolks
- 1 teaspoon cream of tartar
- 1½ cups sugar
- 1 cup flour
- 1 teaspoon vanilla

Beat egg whites until frothy; add cream of tartar and beat until stiff; then add sugar gradually and the yolks of eggs beaten until creamy to which has been added the vanilla. Fold in the flour and bake forty-five to fifty minutes in unbuttered cake pans.

### *Angel Cake.*

- 8 egg whites
- 1 teaspoon cream of tartar
- 1 cup sugar
- ¾ cup flour
- ¼ teaspoon salt
- ¼ teaspoon vanilla

Beat whites of eggs until frothy; add cream of tartar and continue beating until stiff; then add sugar gradually. Fold in flour mixed with salt and sifted four times, and add vanilla. Bake forty-five to fifty minutes in an unbuttered angel cake pan. After cake has risen and browned, cover with a buttered paper.

### *Lady Fingers.*

- 3 egg whites
- ⅓ teaspoon powdered sugar
- ¼ teaspoon vanilla
- 2 egg yolks
- ⅓ cup flour
- ⅛ teaspoon salt

Beat whites of eggs till stiff and dry. Add sugar gradually, while beating constantly. Beat yolks till thick and lemon-colored. Combine mixtures, add flavoring. Cut and fold in flour mixed with salt. Place on unbuttered paper, sprinkle with powdered sugar and bake in moderate oven 8 or 10 minutes.

### *Butter Cakes.*

All so-called butter cakes contain flour, sugar, liquid, shortening of some kind, and some leavening agent. *Pastry* or *soft wheat flour* is the best to use in cake making. If you have only bread flour then sift three cups of the bread flour with one cup of corn starch and call



the mixture "pastry" flour. It will work all right in any cake recipe. Sugar for cakes is best when very fine, and for extra nice cakes it pays to use powdered sugar.

### *Shortening.*

Butter is usually used to shorten cakes. Many of us think we like it best, and miss its flavor in a delicate cake, but butter is expensive and excellent cakes can be made with cottolene, crisco, or snow drift, while one-half lard and one-half butter make a good mixture.

Soften or melt the fat before beginning to make a cake for this greatly lessens the labor entailed.

### *Liquid.*

Either water or sweet milk may be used with baking powder in butter cakes. If milk is obtainable it will be found desirable to use it. Sour milk, butter milk, or fruit juices may be used with soda.

### *Leavening Agents for Butter Cakes.*

Baking powders of high grades are always thoroughly satisfactory when used in cake baking, and uniform results are obtainable. Soda combined with cream of tartar is really but a home-made baking powder. When it seems desirable to use soda and cream of tartar, care must be exerted to take one measure of soda to two of cream of tartar and to sift the mixture thoroughly.

Soda with sour milk or other sour material is somewhat uncertain in results. If the liquid used is very sour then one level teaspoonfull of soda is needed; but because we have no way to measure the sourness of the liquid we often mis-measure the soda.

### *Combinations of Cake Materials.*

A good recipe, good materials, a well-regulated oven and absolute accuracy in measurements are essentials in successful cake-making.

### *Oven Heat.*

A quick oven is needed for layer cakes. A moderate oven of even heat is required for loaf cakes, while a very slow oven is necessary for cakes containing fruits and for those baked in large pans.

### *White Cake Recipe.*

- ½ cup butter
- 1 cup sugar
- ½ cup milk
- 4 eggs
- 2 teaspoons baking powder
- 1½ cups flour

Cream butter, add sugar gradually and cream. Beat whites stiff, but not dry. Mix and sift baking powder in ½ cup flour. Add

liquid and 1 cup of flour alternately to butter and sugar. Beat thoroughly between each addition. Fold in egg whites and add flour with baking powder. Blend. Bake in loaf or layer tins with buttered paper on bottom of pan.

#### *Yellow Cake Recipe.*

- ½ cup butter
- 1½ cups sugar
- 4 egg yolks
- 1 egg
- ½ cup milk
- ¼ teaspoon soda
- ¾ teaspoon cream of tartar
- 2½ cups flour

Cream butter, add sugar and beat thoroughly. Beat the egg and egg yolks until light-lemon color. Add the eggs to the butter and sugar. Sift soda, flour, and cream of tartar together. Add the milk and flour alternately and beat all together thoroughly. Bake as a loaf cake in a moderate oven.

#### *Chocolate Cake.*

- ½ cup butter
- 1 cup sugar
- 2 eggs
- ½ cup milk
- 2 teaspoons baking powder
- 1⅓ cups flour
- ½ teaspoon vanilla
- ½ teaspoon cinnamon
- 1 square chocolate grated

Cream butter, add ½ cup sugar and cream. Cream egg yolks and ½ cup sugar. Combine mixtures. Beat egg whites stiff, but not dry. Sift 1/3 cup flour, baking powder and cinnamon together. Add to first mixture flour and milk alternately, beating thoroughly between each addition. Add chocolate, melted over hot water, and blend. Fold in egg whites and flour mixture. Pour into a loaf pan lined with butter paper and bake 1 hour in moderate oven, or fill into buttered pudding cups and steam 20 minutes and serve with vanilla sauce.

#### *Cake Score Card.*

##### Baking—

Shape .....	10
Color .....	10
Thoroughness .....	10
Flavor .....	30

##### Texture—

Evenness .....	10
Fineness .....	10
Velvety Appearance .....	20

*Faults in Cakes.*

The commonest of all faults in cakes results from an excessive amount of flour. This condition is indicated when the cake rounds up in the middle and is much thicker than elsewhere.

A perfect cake is almost level on top; if the cake drops in the center there was not enough flour used in proportion to the butter and sugar.

A layer cake is often coarse and dry because of slow baking.

A loaf cake often cracks in the top because the oven was too hot and a crust formed before the cake had completely risen.

NOTE.—Questions will be gladly answered if inquiries are sent to Mrs. Henrietta W. Calvin, Oregon Agricultural College, Corvallis, Oregon.