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Hows and Why for Young Cooks: Extension Circular 9-11-2

Jessie Greene

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HOWS AND WHYS FOR Young Cooks
PREPARED FOR 4-H COOKING CLUBS

THE UNIVERSITY OF NEBRASKA AGRICULTURAL COLLEGE EXTENSION SERVICE AND UNITED STATES DEPARTMENT OF AGRICULTURE CO-OPERATING
Hows and Whys For Young Cooks

JESSIE G. GREENE

It IS not only fun to cook but it is a worth-while accomplishment to be able to plan and prepare attractive, healthful meals. The 4-H Cooking Club project aims to teach young cooks some of the Hows and Whys of food selection, cooking, and canning. To be eligible for this project a girl should be at least 12 years of age or have completed the “Learning to Cook” project.

Requirements

<table>
<thead>
<tr>
<th>Problem</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Prepare fresh fruit                        6 times&lt;br&gt;cooked fruit                      3 times&lt;br&gt;fruit beverages               3 times&lt;br&gt;Read pages 5, 6, 7.</td>
</tr>
<tr>
<td>II</td>
<td>Prepare milk beverages                     2 times&lt;br&gt;cream soups                      2 times&lt;br&gt;eggs                             6 times&lt;br&gt;custards                         2 times&lt;br&gt;other puddings                   2 times&lt;br&gt;Read page 10.</td>
</tr>
<tr>
<td>III</td>
<td>Prepare cooked cereals                     4 times&lt;br&gt;quick breads                    2 times&lt;br&gt;Read page 17.</td>
</tr>
<tr>
<td>IV</td>
<td>Prepare whole wheat bread                  2 leaves&lt;br&gt;white bread                    2 leaves&lt;br&gt;rolls                            1 time&lt;br&gt;cookies                          1 time&lt;br&gt;Read pages 20, 21, 22, 23.</td>
</tr>
<tr>
<td>V</td>
<td>Plan, prepare, and serve                   1 breakfast</td>
</tr>
<tr>
<td>VI</td>
<td>Can 4 jars fruit, 4 jars tomatoes, 2 jars greens and 4 jars other vegetables.</td>
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</tbody>
</table>

Score food habits at the beginning and close of the project. Prepare or assist with the preparation of 50 meals.

Complete the requirement of each problem as soon as possible after it is presented in the club meeting. The way to learn to cook is to cook whenever you have the opportunity. We hope you will not be satisfied with merely meeting the requirement. Keep the record—it will be simple if kept up to date.

This project is arranged as a breakfast unit, but if it seems advisable; Problem II may be used first.

Review the canning of fruits in Learning to Cook and study the canning of vegetables on pages 34 to 42. Start canning as soon as there is something to can.
Problem I—Food Selection—Fruit

GOOD health is not an accident. It is the result of the way we and our ancestors have lived. Food plays such an important part in good health that we place it first in the following list of factors which help us to have good health:

- Wholesome food
- Plenty of sleep
- Sunshine and fresh air
- Exercise
- Freedom from worry
- The desire to be helpful to others

Since food is so important we need to learn all we can about how to select it wisely. The food selection score card gives us a standard for our daily diet and scoring our food habits will show how we measure up to this standard. It is not a complete diet and moderate amounts of fat, sweets, bread and other desirable foods should be added.

DIRECTIONS FOR USING FOOD SELECTION SCORE CARD

Score yourself each day for a week at the beginning of the project and again near the close of the project. If you did not use as much as the lowest number on the score card give yourself a zero. Do not divide the numbers. For example, 2 cups of milk is 10 points, less than 2 cups is zero. If your average score is below 90, raise it by improving your food habits where they need it.

### Perfect Score

**Food Items** | **Milk** | **Vegetables** | **Fruits** | **Whole grain products** | **Cheese, eggs, meats, dried beans or peas** | **Water** (total liquid) | **Deductions**
---|---|---|---|---|---|---|---
**S** | 2 full cups 10, 3 full cups 15, 4 full cups 20 | 1 serving 5, 2 servings 10, 3 servings 15 | 1 serving 10, 2 servings 15 | 1 serving 10, 2 servings 15 | 1 serving of any one above 10, 1 serving each of any two above 15 | 4 cups 5, 6 cups 10 | Use of tea or coffee 10
**M** | Exercise | Personal hygiene | Personal hygiene | Personal hygiene | Personal hygiene | Use of tea or coffee 10 | Use of tea or coffee 10
**T** | Freedom from worry | The desire to be helpful to others | The desire to be helpful to others | The desire to be helpful to others | The desire to be helpful to others | Use of tea or coffee 10 | Use of tea or coffee 10
**W** | Exercise | Freedom from worry | Freedom from worry | Freedom from worry | Freedom from worry | Use of tea or coffee 10 | Use of tea or coffee 10
**T** | Freedom from worry | The desire to be helpful to others | The desire to be helpful to others | The desire to be helpful to others | The desire to be helpful to others | Use of tea or coffee 10 | Use of tea or coffee 10
**F** | Exercise | Freedom from worry | Freedom from worry | Freedom from worry | Freedom from worry | Use of tea or coffee 10 | Use of tea or coffee 10

### USES OF FOOD IN THE BODY

Food nutrients may be divided into six groups: proteins, carbohydrates, fats, mineral nutrients, vitamins and water. Carbohydrates include starches, sugars and cellulose which is the framework of fruits and vegetables and the covering of grains. Water does not nourish the body in the same way as other nutrients do but it is necessary to life and life processes so we consider it a food nutrient.

Foods serve three important uses in the body, they build and repair tissues, yield energy or the power to do work, and regulate body functions. Some foods serve only one purpose, some two, while others serve all three of these uses in our bodies.

- **Body building.**—This requires protein, mineral nutrients and water. Milk, cheese, meat, eggs, poultry, fish, dried peas and beans are especially valuable for their protein. Fruits, vegetables, whole grains, and protein foods are especially valuable for minerals.
- **Energy yielding.**—For this we need starch, sugars, fats, and proteins. Cereals, breads, starchy vegetables, sweets and many fruits as well as foods rich in protein supply material for energy.
- **Body regulating.**—This requires mineral nutrients, vitamins and water. Fruits, vegetables, whole grains, milk and other protein foods are valuable for body regulating as well as for body building.

The right kind of food is needed to promote health. When certain food nutrients are left out of the diet or are present in too small amounts, poor health or serious diseases result.

People frequently suffer from lack of appetite because of a shortage of vitamin B in the diet. Vitamin A is needed so that it will be possible for the eye to adapt readily to light and dark. This is particularly important to people who drive cars at night. Vitamins A and C are concerned with the building up of resistance against infections such as colds. Vitamin G is necessary to the growth and good health of all the living cells of the body. Symptoms of mild vitamin deficiencies include: weakness, poor growth, intestinal disorders, digestive disturbances, poor assimilation, nervousness, headache, and restlessness.

Extreme mineral and vitamin deficiencies result in serious diseases. When not enough foods rich in iron are used a disease known as anemia results. Babies sometimes develop rickets because of a shortage of calcium, phosphorus, or vitamin D, or a poor balance between the three. In the oriental countries a
nervous disorder known as beriberi results when the people live too largely on a diet of polished rice, which has had most of its vitamin B removed. In the southern part of our own country there have been occasional outbreaks of a disease known as pellagra, which develops when the people live on a diet consisting almost exclusively of corn meal and fat salt pork. When vitamin C is lacking, a disease known as scurvy results. Vitamin C is also necessary for the health of the teeth and gums.

PLANNING MEALS FOR HEALTH

After we know what foods the body needs and the purposes which different foods serve in our bodies the next step is to plan the home meals so each member of the family is well nourished. Nutrition experts have worked out the food selection score card which gives us a standard for good nutrition. The days requirement for minerals and vitamins will be met if we use the standard for planning meals given on the score card. We may refer to this as the 4, 3, 2, 2, 2, standard for daily meals. Plan a day's meals that will score 100 by the food selection score card. Compare and discuss menus at the next club meeting.

STANDARDS FOR PREPARING AND SERVING FOOD

The Food Selection Score sheet gives standards for our daily diet. Now let us consider some of the other standards which we should keep in mind as we are preparing and serving food. These standards may be grouped under the four headings: cleanliness, neatness, accuracy, and economy.

Cleanliness.—Have your hair well combed and pinned back before you begin so you will not need to touch it while cooking. A cap or hair band helps to avoid the danger of hair falling into food.

Wear a clean apron while preparing food.

Begin work with clean hands and clean finger nails. Wash hands carefully with soap and warm water, then wash them again if you handle your handkerchief, fuel, or any dusty or soiled object.

Do not put the spoon from which you have tasted back into the food you are preparing.

Do not use the stirring or mixing spoon for a tasting spoon.

Do not taste from a spoon which has been used by another person.

Neatness and order.—Keep the stove, work table, utensils, and kitchen neat and orderly as well as clean. This can be done if we think about it as we are working.

Use a utensil pan, that is, a pan in which to lay spoons, forks, egg beaters, etc. This will protect the table.

Work carefully, stack used dishes. Keep table top free from flour, water, dough, or any food with which you are working.

Economy.—A 4-H club member should learn to save time, energy, food, and fuel. We must think beforehand as well as while we are doing our work. The following suggestions will help us to practice economy. As you work, think of other ways to save.

Read the recipe carefully and decide what utensils and supplies are necessary.

Collect and arrange them conveniently on the work table.

Plan to have heat for cooking ready at the proper time.

Save dishes by measuring dry ingredients first, then liquids and fats.

Scrape food carefully from mixing bowls and all cooking utensils. It may seem only a small amount but in time, a great deal of food is saved in this way. A plate scraper is convenient for this.

Watch food carefully so that it does not burn or boil over on the stove.

Why should we save time? Because there are so many worthwhile things to do and so many ways in which we can improve ourselves. Girls who share home responsibilities realize that the necessary duties of life take a great deal of time. In fact, unless we plan our work carefully, we will not have time for helping other people, for recreation, reading, and the numerous other things that make our lives happier.

Accuracy.—If we measure accurately we are more likely to have success with our cooking. Our mothers have had so much experience that they may not need to measure as carefully. In fact, an experienced cook measures a great deal by sight. 4-H club girls should learn to measure accurately and then practice until they can do it quickly. All measurements in the 4-H recipes are level. Sift flour before measuring. See "How to Measure" in Learning to Cook.

ABBREVIATIONS, WEIGHTS, AND MEASURES

<table>
<thead>
<tr>
<th>c.</th>
<th>cup</th>
<th>3 t. = 1 T.</th>
</tr>
</thead>
<tbody>
<tr>
<td>t.</td>
<td>teaspoon</td>
<td>16 T. = 1 c.</td>
</tr>
<tr>
<td>T.</td>
<td>tablespoon</td>
<td>2 c. = 1 pt.</td>
</tr>
<tr>
<td>oz.</td>
<td>ounce</td>
<td>pt. = pint</td>
</tr>
<tr>
<td>lb.</td>
<td>pound</td>
<td>qt. = quart</td>
</tr>
<tr>
<td>F.</td>
<td>degrees Fahrenheit</td>
<td></td>
</tr>
</tbody>
</table>

2 c. = 1 lb. and 2 T. = 1 oz. liquid, sugar, fat or finally chopped meat
4 c. = 1 lb. and 4 T. = 1 oz. white flour
15 lbs. potatoes = 1 peck
1 square chocolate = 1 oz.

This table will be valuable in figuring the cost of recipes.

FOOD VALUE OF FRUIT

Fruits, especially fresh ones, are appetizers; they are laxative due to cellulose and acids and have energy value. The heat which food produces in our bodies is measured by calories. Find a table of 100 calorie portions and compare the calorie value of different fruits. Fruits and vegetables are important sources of at least two essential minerals; iron and calcium. Vitamin C is usually destroyed by heating, so all fresh, raw fruits and vegetables contain some vitamin C. Citrus fruits (oranges, grapefruit and lemons) are the best sources of vitamin C. Tomatoes contain acid and even though cooked a short time they are a very good source of vitamin C. Fruits as a whole do not supply much of vitamins A and D but practically all contain a fair amount of vitamin B1 and a few are fair sources of vitamin G. For these reasons we should have two servings of fruit each day including a citrus fruit or tomato.
WAYS OF SERVING FRUIT

As appetizers—fresh and canned fruits.

As beverages—fruit juices.

As relishes or spreads—tart fruit with meat, fruit pickles, jams and jellies.

As salads and desserts—fresh, dried or canned, alone or in combination with other fruits. Many fruits are used in short cakes, cobblers, pies and in desserts with gelatin, tapioca, rice or cornstarch.

HONEY WITH FRUIT

Honey intensifies the natural fruit flavors and is delicious when drizzled on fresh fruits served for breakfast, for salads or desserts. To warm honey, place the jar in warm water until it is thin enough to drizzle in a fine stream. If thick honey is used, the product will be too sweet.

Honey may be substituted for all or part of the sugar for sweetening fresh or cooked fruits or fruit beverages.

WHOLE FRUIT

Apples, oranges, bananas, peaches, pears, plums, and grapes may be served whole with their skins on. Fruit served in this way should be washed and dried before serving.

TO PREPARE ORANGE OR GRAPEFRUIT IN THE SKIN

Cut fruit in halves crosswise. Remove seeds with a fork. With a sharp knife loosen each section from the membrane around it; follow the membrane around the section toward the rind and back to the center. Sections of grapefruit are more easily lifted out if the center is not removed. For special occasions a fresh or preserved cherry or strawberry may be placed in the center of each half. Half a grapefruit is served to each person. Grapefruit may be served with sugar or salt.

TO DICE ORANGES OR GRAPEFRUIT

Prepare as for serving in the skin. Remove the half sections and if too large cut again. Cut sections on a board using a sharp knife. Squeeze out any juice left in the skin. This is an attractive way to prepare the fruit for salad or gelatin. The thin membrane surrounding the sections of naval oranges is not objectionable and is valuable as roughage.

BAKED APPLE

6 apples 1 t. lemon juice, if desired

1 or 1/2 c. sugar, honey or syrup

Wash and core the apples, leaving the blossom end to help hold the filling. Cover the bottom of the pan or baking dish about one-fourth inch with water. Put apples in, fill cavities with sugar, and add a few drops of lemon juice if desired. Bake in a moderate oven until soft, or about 30-40 minutes.

Variations.—Chopped raisins, orange marmalade, dates, nuts, cooked rice or other cereal may be used for filling the centers.

APPLE SAUCE

4 apples 4 to 1/2 c. sugar, honey or syrup

1 or 2 slices lemon 1 or 2 whole cloves, if desired

Wash, pare, and quarter apples. Place in a pan with lemon and cloves and almost cover with water. Cook until soft. Add sugar and continue heating until sugar dissolves. Remove lemon and cloves and serve hot or cold.

Variations.—Cinnamon candy may be used for coloring. Apples are more nutritious if unpaved.

DRIED FRUIT

Wash carefully through several waters, always lifting the fruit out of the water. Soak several hours or overnight in cold water enough to cover. Dried apples are an exception because they take up water more readily than other dried fruits, and soaking darkens them. Cook slowly in the same water over the direct heat or in the double boiler until tender. Add sugar if necessary and heat a few minutes longer to dissolve the sugar. Most dried fruits are sweet and need little sugar. From one-fourth to one-half cup for each pound of fruit is usually enough. Prunes, raisins, and figs are delicious cooked without sugar. As the amount of sugar is decreased the natural fruit flavor is increased. Well soaked dried fruits may often be served without cooking.

FRUIT BEVERAGES

A glass of lemonade on a hot day is refreshing and healthful. There are many delicious combinations of fruit juices. Think about them when you are helping mother with the canning and save left-over juices for fruit drinks.

LEMONADE

Club girls should be able to estimate the number of lemons required to serve lemonade to a group of people. This is a simple matter if we know the amount required for one serving. The following suggestions will be helpful.

Wash and dry a lemon, noting its size, cut in half, remove seeds and squeeze out the juice. Measure the juice and fill in the following blanks. In the first blank write small, medium or large and in the second blank the number of tablespoons of juice the lemon contains.

1 lemon = ....... T. juice.

Mix 1 T. juice and 1 T. sugar in a glass. Add one half cup water, stir and taste. If too strong add one fourth cup water. This will make about one serving in an ordinary glass. If too weak add a measured amount of lemon juice and sugar. After you have decided on the amount for one serving required to suit your taste fill in the following blanks.

T. lemon juice and ....... T. sugar for 1 glass lemonade.

When preparing lemonade for a picnic, it is convenient to carry the lemon juice-sugar mixture in a glass jar. Figure amounts from your individual serving recipe.

Variations.—Grated yellow peel, slices of lemon or sprigs of mint may be added. A fruit punch is made by adding other fruit juices. When canned fruit juices are used, alter the amount of sugar according to the sweetness of the juice.

HONEY WITH FRUIT

Honey intensifies the natural fruit flavors and is delicious when drizzled on fresh fruits served for breakfast, for salads or desserts. To warm honey, place the jar in warm water until it is thin enough to drizzle in a fine stream. If thick honey is used, the product will be too sweet.

Honey may be substituted for all or part of the sugar for sweetening fresh or cooked fruits or fruit beverages.
Problem II—Milk—Eggs

Let us call the 4, 3, 2, 2, 2, standard for meal planning our rules of the food habit game. Are you playing the Food Habit game every day?

FOOD VALUE OF MILK

Milk is an excellent source of vitamins A and G. It is a fair source of B and sometimes contains a little C. It is an excellent source of calcium, a good source of phosphorus but a poor source of iron. Milk also contains protein, fat and carbohydrate.

CARE OF MILK

Have you ever seen a child take a taste of milk and then leave the rest in his glass? Perhaps its good taste had been spoiled by careless handling. Milk and butter absorb odors easily. They should not be placed near foods of strong odor. The cows and barns need to be kept clean and free from disease. Milk may carry disease germs unless it is handled under sanitary conditions. In an up-to-date dairy all utensils are carefully sterilized. We may not have the same equipment in our homes but we can use plenty of boiling water and sunlight on milk utensils. Flies carry filth and disease germs and should never be allowed around milk dishes.

Here are a few rules for the care of milk in the home, some of which apply to people who buy their milk:

- Keep milk clean, covered, and cool.
- Place milk in the coldest part of the refrigerator or in a place below 50°F.
- Keep the refrigerator clean.
- Wash the mouth of the milk bottle before pouring the milk. Keep milk in the bottle until it is used.
- Do not mix new and old milk.

LEARNING TO LIKE MILK

People who have plenty of milk in their homes do not always use as much as they need.

These suggestions will help us to teach young children to enjoy milk:

- Drink milk through a straw or macaroni.
- Give the child a separate small pitcher and cup.
- Use a bowl with a story picture in the bottom.
- Paste pictures on the bottom of the glass.
- Break bread into the milk.
- Flavor the milk with honey, fruit juices, vanilla, cocoa, chocolate, or malted milk powder.

HEATING MILK

Milk is easily scorched and boils over quickly so it is best to heat it in a double boiler. One can improvise a double boiler by using two sauce pans.

METHODS OF COMBINING WHITE SAUCE

<table>
<thead>
<tr>
<th>Kind</th>
<th>Fat</th>
<th>Flour</th>
<th>Milk</th>
<th>Salt</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thin</td>
<td>½ to 1 T.</td>
<td>½ to 1 T.</td>
<td>1 c.</td>
<td>¼ t.</td>
<td>Creamed soups</td>
</tr>
<tr>
<td>Medium</td>
<td>1½ to 2 T.</td>
<td>1½ to 2 T.</td>
<td>1 c.</td>
<td>¼ t.</td>
<td>Creamed and scalloped dishes</td>
</tr>
</tbody>
</table>

The sauce-pan method saves time. The double boiler avoids scorching and is an advantage for large quantities.

Hows and Whys for Young Cooks
CREAM OF VEGETABLE SOUPS

An attractive way of serving two important foods, vegetables, and milk, is to combine them in the making of cream soups. It is interesting to work out a general recipe and then one may vary the soup according to the materials on hand.

Let us call this our foundation cream soup recipe:

1-3c. cooked vegetables (may be mashed, strained, diced, or left whole as in case of peas and corn)
4 c. milk or part milk and part vegetable water
1 slice onion finely chopped or scraped (may be cooked in butter)
2-4 T. flour. 2-4 T. butter. Salt.

Combine the vegetable and white sauce, then season to taste. The amount of salt needed in a cream soup varies with the amount which has been used in cooking the vegetable. The general proportion is one teaspoon of salt to a quart of liquid but if a cooked salted vegetable is used little or no salt may be needed.

Variations.—Cream soups may be made without flour. Whole cooked cereal such as barley and rice or mush made from ground cereals may be used instead of flour for thickening. The amount of cereal used varies with the vegetable and personal taste. Starchy vegetables require less thickening. Left-over cereal may be used. When the cereal is cold and stiff it needs to be finely divided by mashing and by adding hot liquid to it gradually or by using a rotary beater. If this is done, the cereal will not appear in the soup in lumps. Celery or parsley adds a nice flavor to many vegetable soups. Finely chopped leaves or parts of the stalk which are not so nice for serving may be used. If celery or parsley leaves are dried and crushed, they are ready for use at any time. Parsley is also attractive as garnishing.

If you should want to make cream of tomato soup ask mother how she makes it. It is more difficult because tomatoes contain an acid which must be partly neutralized or destroyed before they are added to the white sauce, or the milk may curdle.

FOOD VALUE OF EGGS

Eggs are a protein food, rich in minerals and vitamins. Egg yolk is an excellent source of iron and phosphorus and a fair source of calcium. It is an excellent source of vitamins A and G; a good source of B and contains some D. Besides protein, egg white contains vitamin G and very little mineral.

CARE OF EGGS

Eggs should be clean. As soon as gathered, put them in a cool place. Unless the shell is dirty, do not wash the eggs, as there is a natural coating that protects the pores to some degree. Cold storage prevents the growth of bacteria which enter the egg through the porous shell. Egg yolks, if unbroken, may be covered with water and kept several days in the refrigerator. Egg whites will keep for several days in a covered glass if no water is added. If a fresh egg has a thick upstanding yolk surrounded by a tough membrane, a clean firm white, a good odor and flavor.

COOKING EGGS

Heat coagulates the protein of eggs and boiling temperature toughens it. We use the terms soft-cooked and hard-cooked rather than soft-boiled or hard-boiled when eggs are cooked below the boiling point of water. The amount and temperature of the water, the size and shape of the pan used and the temperature of the eggs before cooking affect the time of cooking. When cooking eggs in the shell, the surest way to have them right is to test one when you think they are ready and if they need more cooking the others may be left in the water for a longer time.

POACHED EGGS

Pour water into a frying pan or shallow stewpan to a depth of 1 inch or more. Add 1 t. salt for each pint of water. Heat to boiling.

Break each egg into a saucer. Reduce heat so that the water does not boil. Slip eggs one at a time gently into the water. Cover pan and let stand until the white of the egg is coagulated and there is a white film over the yolk (about 5 minutes) according to the degree of firmness desired.

Remove eggs from water with a greased skimmer or perforated ladle and slide onto pieces of buttered toast prepared while eggs are cooking. Garnish with small sprigs of parsley.

Eggs may be poached in hot milk.

Standard: Regular in shape, yolk covered with a film of white; white thoroughly coagulated but tender.

SCRAMBLED EGGS

1 egg—beaten
2 T. milk, cream or water
1-3 c. cooked vegetables
Beat the yolk, add milk and seasonings.

Combine egg, milk and seasonings. Melt fat in a heavy frying pan or double boiler.

Pour in mixture. Cook until creamy, stirring and scraping from bottom of pan. Parsley or sliced tomato may be used as a garnish.

Standard: Moist, but coagulated enough to hold together; shiny appearance, tender, well seasoned.

PUFFY OMELET

1 egg yolk
1 egg white
1 T. milk
Beat the yolk, add milk and seasonings.

Beat the white until stiff but not dry.

Fold beaten white into yolk mixture. With the spoon edgewise, cut the ingredients, lift and turn them over. Repeat until the white and yolk are mixed.

Pour the mixture into a hot frying pan (heavy skillet) in which fat has been melted and spread evenly.

Cook slowly until well risen and slightly browned on the bottom. Place in a moderate oven (350° F.) for a few minutes to dry top. The omelet should spring back when touched.

Fold in the following manner: Hold pan by the handle with left hand; with a case knife make a crease through center of omelet at right angle to the handle. Place knife under part nearest handle, tip pan to nearly vertical position, and carefully fold it without breaking.

Serve at once. Allow one egg for each person.

Variations.—Sprinkle 1 T. grated cheese over omelet before placing in oven. Place any one of the following over omelet before folding; buttered asparagus tips, 1 T. chopped, cooked bacon or ham, 1 T. jelly or jam.

Standard: Very light and fluffy, sufficiently coagulated but tender. Delicately browned; well seasoned; should hold shape long enough for serving.
CUSTARDS AND MILK PUDDINGS

Custards are combinations of milk and egg sweetened and flavored. Since
the eggs are used as thickening agents they should be beaten slightly, just
enough so they will mix with the milk. The custard will be smoother if
strained before cooking. When a soft or stirred custard is cooked too long
or at too high a temperature it separates or curdles. This may be remedied
by cooling then beating with a rotary egg beater.

CUSTARD

2 c. milk
2 eggs
¾ c. sugar or
2 T. sugar and
2 T. syrup

Scald milk. Break eggs into bowl, and beat slightly, adding the sugar and salt. Add
scalding milk slowly to the egg mixture, stirring constantly. Since we have learned that
eggs cook at a low temperature, what would happen if we added the egg mixture slowly to
the scalded milk?

For soft or stirred custard, cook mixture in a double boiler and stir constantly until
it thickens and forms a coating over the bowl of the stirring spoon. Keep water in lower
part just below the boiling point to avoid over cooking. Eggs cook so quickly, it takes
only a few minutes when the milk is scalding hot. Remove the top part of the double
boiler from the lower part to stop the cooking or place in a pan of cold water, and set
aside to cool. Since this is a soft custard, the flavoring may be added after it has cooled.

Standard for soft custard: Smooth and velvety, consistency of rich cream.

For baked custard pour the mixture into cups or a baking dish surrounded by hot
water. Bake in an oven at 350° F. about 30 minutes or until a silver knife inserted in the
center comes out clean.


CORNSTARCH PUDDING

1½ c. milk
3 T. cornstarch
½ c. corn syrup
½ t. flavoring

Scald one cup milk. Mix one-half cup cold milk, cornstarch and salt thoroughly. Add
to scalded milk. Mix well and return to the double boiler. Add corn syrup slowly to avoid
curdling. Cook 10—15 minutes, stirring occasionally. Stir slowly into beaten egg yolk,
return to double boiler and cook one minute. Add flavoring. Pour into serving dish.
Top with honey meringue.

(Honey meringue
Place one egg white and one-fourth cup of honey in a bowl. Beat with a rotary egg
beater until it is stiff enough to stand in peaks.

TAPIOCA CREAM

3 T. Min. Tapioca
½ t. salt
½ c. sugar
2 c. milk
1 egg
½ t. flavoring

Combine tapioca, sugar, salt and milk in the double boiler. Place over boiling water,
bring to scalding point (allow 3 to 5 min.) and cook 5 min. or until clear, stirring fre-
quently. Pour the hot mixture slowly into the beaten egg yolk stirring constantly. Return
to the double boiler and cook until slightly thickened. Fold in the beaten egg white and
place in the serving dish to cool.

HONEY MERINGUE

Place one egg white and one-fourth cup of honey in a bowl. Beat with a rotary egg
beater until it is stiff enough to stand in peaks.

Problem III—Cereals—Quick Breads

CEREALS as well as breads help us to meet the standard of two servings
of whole grain products daily.

FOOD VALUE OF CEREALS

All cereals are the seeds of grains. Besides the outer husk each kernel is
made up of three parts:

- The bran lies next to the husk and consists of several layers of fiber or
  cellulose. It also contains mineral salts, vitamins, and some protein.
- The endosperm, or starchy part of the grain, is the largest portion and con-
  tains chiefly starch and protein.
- The germ from which the grain sprouts, contains fat, some carbohydrate,
  proteins, mineral matter, and vitamins.

Milling removes much of the cellulose, mineral matter, vitamins, fat, and
some protein so many refined cereals consists largely of starch.

One function of food is to produce heat in our bodies. The calorie or
unit for measuring heat produced by food may be compared to the inch
which is a common unit for measuring. Considering that the daily energy
requirement of the average man is 3,000 calories, each 100 calories of food
represent 1/30 of the day’s requirement. Nutrition experts have called 1/30
of the day’s requirement a “share.”

Comparing shares of whole wheat flour and white flour the whole wheat
contains twice as much calcium, about three times as much phosphorus and
iron and forty-three times as much vitamin B as white or refined wheat flour.
Whole wheat flour contains vitamin G which white flour lacks.

Enriched flour is white or near white flour which has had two vitamins and
one mineral added. The vitamins are thiamin (B1) and niacin. The mineral
is iron. These nutrients which are removed in the milling process are most
often lacking in our diets. In order to be sure of getting these nutrients buy
whole wheat flour and only enriched white flour.

BUYING CEREALS

Uncooked cereals are more economical to buy than ready-to-serve cereals.
The weight is given on the package and in order to compare them we need
to consider weight as well as price. How does the price per pound of cracked
wheat and puffed wheat compare? It will be interesting to discuss the cost
of different cereals in the club meeting.

COOKING CEREALS

Cereals are chiefly starch which is in a dry granular form. When cooked
in liquid the starch granules absorb moisture and increase in size. Cooking
softens the cellulose and improves the flavor of the cereal.

Cereals are cooked in boiling salted water or in hot milk. When adding
cereal to boiling water care must be taken to prevent lumping.
Ways to prevent lumping.—Sprinkle granular and flaked cereals slowly into boiling water. The movement of the boiling water separates the grains and flakes. Fine cereals like corn meal may be mixed with cold water and poured into boiling water. Stir constantly while adding cereal and while cooking over the flame. Use a fork for stirring flaked cereals.

Method of cooking.—Cook in the upper part of a double boiler over an open flame or on top of the stove until thick, then finish cooking over hot water by placing the inner part into the outer part of the double boiler. Cereals such as rolled oats and corn meal require about 30 minutes. Cracked wheat and other coarse cereals require an hour or more. Why is it an advantage to use a double boiler for cooking cereals?

Cooking with milk.—Substitute milk for a part or all of the water used in cooking the cereal. In case all milk is used it will be better to do all of the cooking over hot water, and cook about one-third longer.

<table>
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<th>Example</th>
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<th>Amount of Water</th>
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<tr>
<td>Flaked</td>
<td>Rolled Oats</td>
<td>1 c.</td>
<td>2 c.</td>
<td>½ t.</td>
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<tr>
<td>Whole</td>
<td>Rice</td>
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<td>4 c.</td>
<td>1 t.</td>
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<tr>
<td>Granular</td>
<td>Cornmeal</td>
<td>1 c.</td>
<td>5 or 6 c.</td>
<td>1¼ to 1½ t.</td>
</tr>
</tbody>
</table>

SERVING CEREALS

Cereals are usually served with milk or cream. Dried fruit such as dates, figs or raisins may be added toward the end of the cooking. Fresh or stewed fruit may be served with either cooked or prepared cereals.

Some prepared cereals are improved by placing in a moderate oven before serving. It requires only a short time to make them crisp. Watch closely to prevent scorching.

Left-over cereal.—Some uses for left-over cereal are to thicken soups, to bind meat loaf or croquettes, to substitute as part of the flour in quick breads and to serve as a pudding. Cereal made with milk, with dried fruits added, is especially nice for a pudding.

QUICK BREADS

By quick breads we mean breads such as muffins, corn bread, and biscuits, which are made light by some leavening other than yeast. What happens when a speck of soda is added to a tablespoon of sour milk? Try it and see. Baking powder is made of soda and an acid substance with some starch added to keep the soda and acid separated. When moistened, baking powder forms bubbles of carbon dioxide gas just as do soda and sour milk. When a batter or dough containing this gas is heated, the bubbles expand and make the mixture light.

If you are privileged to take home economics you will learn more about the "whys" of cooking. We may also learn many things from people who have had more experience and training, as our mothers, club leaders, and teachers.

BATTERS AND DOUGHS FOR QUICK BREADS

What is the difference between batters and doughs? They are both mixtures of flour and a liquid, but the proportion varies.

Batters are thin enough to beat.

"Thin batters" are thin enough to pour. Example: Griddle-cake or waffle batter.

"Drop batters" are thick enough so that most of the batter drops from the mixing spoon at once. Muffin batter with the proportion of one cup liquid to two cups flour is an example.

Doughs are stiff enough to be handled on a board.

Soft doughs. Example: Baking powder biscuits.

Stiff doughs have the proportions of one cup liquid to about three cups of flour. Example: Yeast bread.

These terms are general, we may have a soft or a stiff drop batter, a medium or a very stiff dough.

GENERAL DIRECTIONS

Preliminary.—Start oven in plenty of time. Collect utensils and ingredients. Prepare pans. An easy way to grease the pans for baking is to place a piece of wax paper over the fingers. Apply grease with the paper and then throw it away.

Measuring.—Use level measurements. Sift flour before measuring. Stir baking powder or soda in the can to make it lighter before measuring. If lumpy, crush the lumps so you can measure accurately. Save dishwashing by measuring dry ingredients first; then use the same cup for liquids and fats. If we measure accurately when we first begin to cook, it will become a habit and take no longer than "just guessing."

Mixing methods.—

Muffin Biscuit or pastry See recipes.

Mixing techniques.

Stirring. Move the spoon with a circular motion around the bowl until the dry and wet ingredients are mixed.

Beating. Move the spoon from the bottom of the bowl up through the batter and over to the other side, with a long stroke. Beating an egg is a good example of how beating makes the product light by inclosing air. Some batters are beaten with the idea of inclosing as much air as possible. When this is the case the mixture should not be stirred after beating because stirring breaks the air bubbles that are forming and the product will not be as light.

Cutting and folding. Cut down into the batter with the edge of the spoon and then lift and turn or fold it over. This is the method used for combining beaten egg white with a batter.

Kneading. Turn the dough onto a board covered with a very thin layer of flour. See description of kneading bread page 21.
Baking.—Many times breads are well prepared and then spoiled in the baking. The most accurate method for determining the heat of an oven is to use an oven thermometer or an oven heat regulator. If you have either of these at home, ask your mother about them. If not, she will help you estimate suitable baking temperatures.

Oven heat Temperature
Slow ............................ 250°F to 350°F
Medium or moderate ............................ 350°F to 400°F
Hot ............................ 400°F to 450°F
Very Hot ............................ 450°F to 550°F

PLAIN MUFFINS
2 c. flour 1 egg
3 t. baking powder 1 c. milk
½ t. salt 3 T. lard (melted before measuring)
2 T. sugar or substitute

Grease the muffin pans. Mix the flour, baking powder, salt, and sugar in the mixing bowl. Beat the egg in a smaller bowl until foamy and add the milk. Add melted fat to the milk-egg-mixture and immediately turn it into the flour mixture. Stir until all of the dry ingredients are dampened but not enough to remove all of the lumps. Overstirring causes long holes or tunnels on the inside of the muffins and peaks on the crust. Drop the batter immediately into the pans with as little stirring as possible. Fill muffin pans about half to two-thirds full and bake in a hot oven (425°F) from 12 to 15 minutes, or until the crust is an even golden brown color. For best results with this method the ingredients should be about room temperature or 75°F. If the milk-egg mixture is cold the melted fat forms solid particles which remain in the batter.

Variations.—For sweet-cream muffins use 1 c. thin cream and no other shortening. For graham or whole wheat muffins use about equal amounts of dark and white flour. Mix the same as the plain muffins except that the graham or whole wheat flour is added without sifting. For cornmeal muffins use ½ c. corn meal and about 1½ c. white flour. This recipe makes a good cornbread when baked in a shallow pan.

Characteristics of Good Muffins.—Light for their size. The outside is golden brown, symmetrical in shape with no peaks or knobs at the top, and a somewhat pebbled, rather smooth, even surface. The inside shows round holes of fairly uniform size, but no long narrow ones which are sometimes called "tunnels."

GINGERBREAD
1½ c. flour ½ t. ginger ¼ c. fat
¼ t. salt 1 t. cinnamon ½ c. molasses, mild
½ t. baking powder ¼ c. sugar or substitute 1 egg
½ c. boiling water

Use the muffin method of mixing. Fat may be melted by placing in the boiling water.

WHOLE WHEAT NUT BREAD
1½ c. white flour ½ c. chopped nuts
½ c. whole wheat flour 1 egg
3 t. baking powder 1 c. milk
½ c. sugar or substitute 2 T. lard (melted)
½ t. salt

Add nuts to the dry ingredients and use the muffin method for mixing. Pour into a greased-loaf pan. Let stand for 30 minutes and bake in a slow oven (325°F to 350°F), for 50 to 60 minutes.

Variations.—One-fourth or one-half c. currants, dates, or raisins may be added with the nuts. Dates and raisins should be cut in small pieces so the bread will slice easily. One-half t. of cinnamon may be added.
Problem IV—Bread—Rolls—Cookies

ANY woman or girl may well be proud of being able to make good bread and having the results uniform each time. To do this requires first an understanding of the principles of bread making, then a selection of good materials, and careful work.

Your record book asks for the time required for making bread as well as baking it. Record only the time that you are working on the bread and not while it is rising, because you can do other things while the bread rises.

You may wonder why the requirement is two loaves of white and two loaves of whole-wheat bread. We want club girls to make such good whole-wheat bread that the family will like it as well as white bread. Then it will be easy to have a high score on whole grains. We have used one-third as much whole-wheat flour as white flour. Some people prefer to make it one-half or even two-thirds whole-wheat flour. As the proportion increases, the bread becomes coarser, darker, and somewhat heavier. When you are satisfied with your results using one-third whole-wheat flour, try a larger proportion. Some families prefer to use bread made with one-third whole wheat all of the time rather than to have white bread and the darker whole-wheat bread both on hand.

Some of the liquids used in bread making are potato water, milk, whey, and water drained from boiled rice or macaroni. One should boil water and scald milk which is used in bread making to kill any undesirable bacteria that may be present. Allow either to become lukewarm before adding the yeast.

Temperatures are very important in bread making. We do not guess at the length of a piece of cloth; we measure it. So in cooking we measure temperatures whenever possible to avoid waste through wrong guesses. A dairy thermometer may be used to test temperatures in bread making. Since yeast grows best at 80° to 85°F, it is desirable to keep the sponge and dough as nearly this temperature as possible. We use the word lukewarm or slightly warm to describe a temperature of 80°F. Since the temperature of the room varies and the flour is likely to be about the same as the room, the temperature of the sponge may be controlled by varying the temperature of the liquid. In cold weather when the flour and room are below 80°F, have the liquid above 80°F. In hot weather when the flour and room are above 80°F, have the liquid below 80°F. In either case, have the mixture lukewarm when the yeast is added and keep it about the same temperature until it is ready for baking. Flour may be warmed by sifting it in front of an open oven door, or it may be set in a warm place before sifting. The sponge and dough may be kept warm by wrapping with a clean blanket. They may be placed in an oven which is not in use to avoid drafts.

Flour for bread making should be kept very clean. In all cooking this is true, but in bread making it is especially so. Conditions that are favorable for the growth of yeast plants are also favorable for the growth of bacteria. Dirt contains bacteria which may produce sour or other objectionable flavors in bread. For this reason one cannot be too careful about keeping the hands and fingernails clean while making bread. Rings should be removed when one is kneading bread.

Flours absorb more moisture than others. Since our proportion for a stiff dough is approximately one part liquid to three parts flour, the above recipe calls for 6 c. flour for the 2 c. of liquid. We have now added 5 c. of flour (3 c. white and 2 c. whole wheat). When the dough is hard to stir the last flour may be kneaded into it. Add just enough so that it will knead easily. It may be less or it may be more than the remaining cup. Usually it will be more but we have given the smaller amount in this recipe because it is easy to stiffen a soft dough, but hard to soften a stiff one. In fact, it is better for a beginner not to try to soften a dough that is too stiff, because liquid makes it sticky on the outside and then more flour is needed.

Kneading.—Knead until the dough is smooth and elastic, and bubbles appear under the surface. This first kneading usually requires about 10 minutes. During the last few minutes we should be able to knead without adding more flour. One can tell when the dough is elastic by denting it with the finger. The dent quickly disappears if it is elastic.

Knead in a warm place so that the dough will not become chilled. In cold weather it may be necessary to warm the flour, the molding board, and the hands. Lightly grasp the dough at the opposite side of the board with floured finger tips, pull it over toward you, and press down with the palms.
the hands, curving the fingers to keep the dough from flattening too much. After every push or two, turn the dough a quarter way around and fold it over toward you. Continue folding, pressing, and turning the dough. When thoroughly kneaded place the dough in a lightly greased bowl.

First rising.—Turn the dough over once or twice in the bowl so that the surface of the dough is thinly greased. This prevents the surface from drying and cracking. Cover with a cloth and set in a warm place to rise. When the dough has risen to about double its original bulk, test with the finger to determine whether it is ready to knead down for a second rising.

Kneading down.—When a light pressure leaves a dent, press down the center of the dough and fold from the sides to the center until the dough is reduced to its original size. This may be done in a minute or less. The purpose is to let out some of the gas so that fermentation may continue without injuring the gluten by causing it to stretch too far and to bring a new food supply near the growing yeast cells. Round the dough into a ball, cover, and set in a warm place to rise.

Second rising.—The second rising may be omitted if desired, but it helps to give a finer, more even, and delicate texture. When the dough has again doubled in bulk and retains the dent when pressed lightly, it is ready to be kneaded down the second time and divided.

Dividing.—Learn to handle the dough quickly and lightly. If possible use no more flour on the board at this time, because it will cause streaks. Divide the dough into equal portions and form into balls. Cover closely and let stand ten minutes. This seals the open pores made by cutting and allows the dough to loosen before molding into loaves.

Shaping into loaves.—Single pans, each holding a one-pound loaf, are best for general appearance of the loaf and thoroughness of baking. Following is one method of shaping loaves. Other methods also give good results.

Flatten the dough into an oblong sheet with the palms of the hands. Fold and seal the long sides together with knuckles. Flatten the dough again, slightly pulling it into a longer sheet. Fold by bringing narrow ends together so they slightly lap at the center and seal with knuckles or palms of hands. Now fold the nearest long side one-third and seal; fold opposite side of dough over and seal it; then shape with the hands into a long roll until it will fit the pan. Place in greased pans smooth side up. Cover and allow to rise in a warm place until it has nearly doubled in size. Bread continues to rise for a short time after it is placed in the oven so we must allow for this.

Baking.—Start the oven so that it will be hot when the bread is ready. It is better to have the oven wait for the bread than for the bread to wait for the oven, because it continues to rise and becomes too light. Ask mother to help you decide when the oven is right. The oven should be between 375° and 400°F. for an ordinary sized loaf. Place the pans so the heated air will circulate around each and the shape of the loaf will be better. It is well to turn the pans after the first 20 minutes to have them bake evenly. The heat may then be lowered a little. Bread is done when the loaves shrink from the sides of the pan and give a hollow sound when tapped. Careful baking gives a golden brown crust. To soften the crust, rub it with a little butter or milk after removing it from the pan. Fill out the resort in your record book.
or into a stone jar, and cover. Do not wrap a cloth around the bread because cloth absorbs moisture and may affect the flavor. Ask mother how often to scald and air the bread box in order to prevent mold.

**BREAD VARIATIONS**

Whole-wheat bread.—More sugar may be added for flavor. Try 4 T. of sugar instead of 2 T. Try substituting molasses or honey for part or all of the sugar. Honey helps to keep the bread moist.

White bread.—Use all white flour.

Milk bread.—Substitute milk for one-half or all of the total amount of liquid used in making bread. The milk should be scalded and cooled until lukewarm before using.

Nut or raisin bread.—One-half to one cup of chopped nuts or raisins may be added to either white or whole-wheat bread when it is made into a stiff dough.

Potato bread.—Many people like bread made with potato water and a small amount of mashed potatoes. If the water is saved when potatoes are cooked for a meal it will save time when preparing the sponge. In order to avoid lumps, drain the water from the potatoes as soon as they are done and mash immediately. One T. mashed potato is used for each loaf of bread and it is added to the potato water.

Bread made with compressed yeast.—Compressed yeast is more moist and acts more quickly than dry yeast. We may complete the process in five or six hours if we use one-half cake for two loaves of bread and see how long it takes. Compressed yeast does not need soaking but we dissolve it in lukewarm liquid before using in order to mix it thoroughly with the sponge or dough.

"Straight-dough" method.—The whole-wheat bread in this problem is made by the "sponge" method. If you would like to try the "straight-dough" method, add the salt before adding the yeast. (To save melting the fat separately, place it in the hot liquid and let the liquid cool until lukewarm before adding the yeast.) Add enough flour to make a medium batter and beat thoroughly. Add the rest of the flour necessary for the dough and proceed as before. Compressed yeast or the new rapid acting dry yeast should always be used for the "straight-dough" method. See if you can find the reason for this in the "Whys" of bread making. The "straight-dough" method is shorter than the sponge method because we omit the rising of the sponge and use rapid acting yeast. The process is completed in four to six hours if conditions are right.

**SOME "WHYS" OF BREAD MAKING**

Bread is made light with carbon-dioxide gas, which is formed by the action of yeast on sugar and starch. The change produced by this action is gum. It is the gluten which becomes elastic when chewed or kneaded. Gas bubbles are held in the dough by elastic gluten.

Have you noticed the odor of alcohol when the oven door is opened after bread begins to bake? Alcohol as well as carbon dioxide gas is formed by the action of yeast on sugar and starch. The change produced by this action is called fermentation. We do not taste the alcohol in bread because the heat of baking vaporizes it or drives it off. Besides vaporizing the alcohol, baking kills the yeast plants and hardens the gluten so that the bread remains porous. If you are privileged to study food chemistry in college you will learn many of the "Whys" in cooking.

**FOOD VALUE OF BREAD**

Breads as well as cereals are excellent sources of energy. We do not think of bread as a protein food but considering the amount which most of us eat, it is valuable as a source of protein as well as of carbohydrate. Graham and whole-wheat breads are valuable for their laxative properties, due to the cellulose they contain. These breads are an excellent source of vitamin B and a good source of iron, phosphorus and vitamin G.

When vegetables and fruits are scarce, whole-wheat bread is more essential because it is an excellent source of minerals, vitamins, and cellulose found in many vegetables and some fruits.

**LEFT-OVER BREAD**

Some of the many ways in which left-over bread may be used are: puddings, scalloped dishes, au gratin dishes, stuffed vegetables, meat loaf, and dressing for poultry and fish.

**ROLLS**

Rolls may be made from bread dough or from a richer, sweeter dough. The amount of dough required for one loaf of bread makes about 24 small rolls.

Plain Rolls.—A general rule for making plain roll dough is to double the amount of sugar and fat used in bread dough. Roll dough is often softer than bread dough. Follow the directions for making bread and when the dough has risen it is ready to be kneaded and made into rolls.

Richer Rolls.—More yeast is added because a richer dough rises more slowly. Double the amount of yeast, add about four times as much fat and sugar as for bread, also add egg if desired. Add the sugar, melted fat, and beaten egg to the light sponge before making the dough.

Light Rolls.—Cut the dough into pieces that are about half the size you wish to have the rolls. Shape into balls and place in a greased pan. Let rise until dough in size and bake about 25 minutes in a hot oven, 425° F. Watch them carefully because they bake more quickly than a loaf of bread.

4-H Club Rolls.—Place four small balls of dough in each muffin pan. Let rise until double in size and bake in a hot oven for about 25 minutes. They should be nicely browned.

Cinnamon Rolls.—Roll or stretch dough into a rectangular sheet about one-fourth of an inch thick. Spread lightly with softened butter. Sprinkle with a mixture of cinnamon and sugar. Chopped raisins may be scattered over the dough before it is rolled. Roll the dough then cut off slices about one inch in thickness and place close together with the cut side down on a greased pan. Let rise until light and bake in a moderately hot oven until well browned and thoroughly baked.
Roll the dough until it is about one-third inch thick; then cut with a biscuit cutter dipped in flour. Make a crease across the center of each round, using the dull edge of a case knife which has been dipped in flour. Brush half of each round lightly with melted butter, fold over at crease, and press edges together. Place in a shallow greased pan about one inch apart. Cover, let rise until doubled in bulk, and bake in a hot oven about 20 minutes.

**SCORE CARD FOR YEAST BREAD**

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</tr>
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**COOKIES**

There are two main classes of cookies, the dropped and the rolled. Dropped cookies are made from a stiff batter and rolled cookies from a soft or stiff dough. In addition to these there is also a type which might be described as "spread and cut" cookies. For "spread and cut" cookies the batter is spread in the baking pan as for a cake. After baking they are cut into bars or squares. Date bars and brownies are examples of "spread and cut" cookies.

Dropped cookies are dropped from a teaspoon onto a greased pan. They are softer than rolled cookies.

Rolled cookies are rolled on the moulding board and cut as desired. The secret of success in making rolled cookies lies in mixing only enough to combine ingredients, handling the dough as little as possible, and using no more flour than necessary. The latter may be accomplished by chilling the dough before rolling. Make light, quick strokes when rolling the dough. Use only enough flour to keep the dough from sticking. Cut or ice-box cookies are a variation of rolled cookies. The dough is richer and stiffer than for rolled cookies. To make them, shape the dough into a cylinder of the diameter you desire in your cookies. Wrap in wax paper and put it in the ice-box or other cold place. When thoroughly chilled, cut the dough into thin slices and bake. Rolled cookies may be either soft or crisp, depending upon the richness and stiffness of the dough and how they are rolled. Rich, thinly-rolled cookies are crisp. Less rich cookies of medium thickness are soft. Soft, rolled cookies are about one-fourth inch thick when baked. Another variation of rolled is stamped cookies explained in Learning to Cook.

**GENERAL RULES FOR MAKING COOKIES**

Conventional or cake method of mixing: Mix and sift the dry ingredients except sugar. Cream the fat; then add sugar gradually. Add the eggs beaten or unbeaten to creamed mixture. Add liquid alternately with part of dry ingredients. Add the remaining dry ingredients. When fruit or nuts are used add them before all of the flour is added. Wash fruit, dry, and dredge with a small portion of the flour before adding it. This is called the cake method because it is one of the methods used for mixing butter cakes.

Quick methods may give satisfactory results. Two quick methods often used for cookies are the muffin method and the cake-mixer method. The cake-mixer method is as follows: Measure all ingredients and sift the dry ingredients. Soften the fat, put all ingredients in the bowl, and stir enough to combine ingredients.

In substituting honey or syrups in cake and cookie recipes calling for rather large amounts of sugar, more satisfactory results are obtained by using one-half the amount of sugar called for and then using the same amount of honey or syrup as of sugar and reducing the liquid in the recipe % cup for each cup of honey or syrup used.

As a rule cookies require less baking powder than muffins and biscuits.

**SUGAR COOKIES**

- ½ c. fat
- 1 c. sugar
- 2 eggs, well beaten
- 2 T. milk or cream
- 3 c. sifted flour
- 1½ t. baking powder
- ½ t. salt
- 1 T. vanilla or ¼ t. nutmeg and ¼ t. grated lemon rind

The cake method of mixing is considered the best one for this recipe but the amount of milk or cream is so small that it is added to the fat-sugar-egg mixture before the dry ingredients are added. The dry ingredients are added in several portions. Chill the dough until firm enough to roll. Roll ½ inch thick on a slightly floured board. Cut with floured cutter. Bake on a smooth ungreased baking sheet in a hot oven 10 minutes or until lightly browned. Makes 3 to 4 dozen cookies. A little more flour may be needed for rolled cookies. Reduce flour to 2 cups when this recipe is used for stamped cookies.

**HERMITS**

- 1½ c. flour
- ¼ t. baking powder
- ½ c. raisins or dates cut in small pieces
- ¼ c. fat, melted or liquid
- ½ c. sugar
- 1 egg
- ¾ t. salt
- 1 T. milk
- 1 t. cinnamon, ½ t. cloves and 2 t. boiling water
- ¼ t. allspice or ginger

The muffin method of mixing is used for this recipe. Mix spices with the boiling water. Add the moist spices, also the milk-egg-fat mixture to the dry ingredients. Stir until the dry ingredients are dampened, about 30 strokes, add raisins, and stir about 30 strokes more. Makes one and one-half dozen cookies about 2¼ inches in diameter. One-fourth cup chopped nuts may be added if desired.
Problem V—Breakfast

It is not difficult to cook one or two foods well at a time but the real test of a good cook comes when meals are prepared. This month each club member is to prepare a breakfast without any help except that mother or someone else may help ten minutes before sitting down at the table. Nearly everyone appreciates having assistance before a meal is served. Are you always thoughtful about helping mother at this time when you are at home? During the last few minutes, especially in hot weather, the bread, butter, cream, and water should be placed on the table and the hot foods taken up and made ready to serve while they are still hot. It takes good management to serve hot food hot and cold food cold.

PLAN THE TIME AND THE MENU:

Plan with mother which day she would rather have you prepare the breakfast. Arrange to suit her convenience. Plan a simple wholesome meal and choose the type of service you will use. A few foods well prepared are better than many poorly prepared. It is part of the daughter's duty as well as the mother's to know the nutritive value of foods so that the family will be properly nourished without serving a great variety at one meal.

Plan the meal at least a day or two in advance so that all the necessary supplies may be ordered. Some people prefer to plan meals several days or even a week in advance. There are advantages in doing this provided one allows for the use of leftovers. Some of the advantages are:

1. More well-balanced meals from the health standpoint. The meals of a day or week are considered as a unit.
2. A better variety.
3. More economical meals. One is likely to plan on using more inexpensive foods.

In order to have variety in our meals, choose foods from the different groups, have contrast in color, flavor, and texture, and avoid repeating the same food even though it is served in a different form. Use the 4, 3, 2, 2, 2 standard.

When planning our breakfasts, let us think of foods which should be included in the light and also the heavier breakfasts.

Light breakfast—suitable for school boys and girls, and grown-ups who exercise moderately; fruit; cereal or buttered toast or both; beverage—milk or cocoa.

Heavier breakfast—suitable for grown-ups doing active work; fruit, cereal; eggs, bacon or meat; bread, rolls or toast; beverage.

Fruit is served first because it stimulates the appetite. Cereal is next because its mild flavor is relished more before such strong flavors as bacon or sweets. As a rule foods served for breakfast should be simple and easily digested. A sample breakfast for a family of five, ages of children 16, 13 and 8 years, is as follows:

<table>
<thead>
<tr>
<th>Time</th>
<th>Work</th>
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<tbody>
<tr>
<td>6:55 a.m.</td>
<td>Cook eggs.</td>
</tr>
<tr>
<td>7:00 a.m.</td>
<td>Place hot foods on table and serve meal.</td>
</tr>
<tr>
<td>7:30 a.m.</td>
<td>Clear the table. Wash and wipe dishes.</td>
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</tbody>
</table>

ORDER SUPPLIES:

Make a list of the supplies that will be needed in plenty of time and order those which are not on hand. For your report figure the total cost of the breakfast as nearly as you can and then the cost for each person. Figure the cost on everything except salt and baking powder because these are used in such small quantities. If the food is raised at home find out the market value, that is, price you would pay if you bought it. You cannot estimate the cost exactly until the meal is over and you know how much was eaten.

On a separate paper work out the cost of your breakfast. Cost of the food in this sample breakfast, using March, 1942, Lincoln prices, is as follows:

<table>
<thead>
<tr>
<th>Materials</th>
<th>Commercial prices per unit</th>
<th>Amount used</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomato juice</td>
<td>$0.25 per No. 5 can</td>
<td>1 qt.</td>
<td>$0.16</td>
</tr>
<tr>
<td>Rolled Oats</td>
<td>$0.13 per pkg. (20 oz.)</td>
<td>1/2 pkg.</td>
<td>$0.04</td>
</tr>
<tr>
<td>Cream</td>
<td>$0.11 per 1/2 pt.</td>
<td>1/2 pt.</td>
<td>$0.11</td>
</tr>
<tr>
<td>Milk</td>
<td>$0.11 per qt.</td>
<td>1 qt.</td>
<td>$0.11</td>
</tr>
<tr>
<td>Eggs</td>
<td>$0.32 per dozen</td>
<td>1/2 dozen</td>
<td>$0.16</td>
</tr>
<tr>
<td>Bacon</td>
<td>$0.30 per lb.</td>
<td>1/2 lb.</td>
<td>$0.15</td>
</tr>
<tr>
<td>Sugar</td>
<td>$0.06 per lb.</td>
<td>1/2 lb.</td>
<td>$0.04</td>
</tr>
<tr>
<td>Butter</td>
<td>$0.41 per lb.</td>
<td>1/4 lb.</td>
<td>$0.07</td>
</tr>
<tr>
<td>Flour</td>
<td>$0.04 per lb.</td>
<td>1/4 lb.</td>
<td>$0.02</td>
</tr>
<tr>
<td>Cocoa</td>
<td>Total cost of the family breakfast</td>
<td>$0.82</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cost of breakfast for each person</td>
<td>$0.16</td>
<td></td>
</tr>
</tbody>
</table>

1 The amount for muffins is included.

MAKE PLAN OF WORK

Plan on paper when you should do each part of the work. Try to arrange so that you will not need to be doing too many things at the same time. Make a note of the time used in preparing the meal, as this is a part of the plan. It will be easy to estimate the time it takes to prepare a certain menu if you have kept your record book up to date. The information in the two columns “Number of minutes for preparation” and “Number of minutes for cooking” is especially valuable when we are preparing meals because it gives us the time required for certain recipes.

In your plan, start everything in plenty of time; then you can keep ahead of your work and not become rushed or excited. Try to have everything done at the right time, not too far ahead and not behind time.
LAY THE TABLE

The main points to be kept in mind are simplicity and the comfort of those to be served. An attractive dining room is well cleaned, dusted and aired before the table is laid.

Linen.—A breakfast, lunch or supper table may be set with a lunch cloth, runners, or doilies. Material for these may range from fine linen to oilcloth, depending upon the occasion and the necessity to economize on the cost of material and the labor of laundering. The simplest material when clean will be appropriate and attractive if it suits the kind of dishes used. Coarse materials seem to fit pottery dishes and finer weaves look well with a lighter type of china. When a lunch cloth is used it should cover the table but need not hang over the edge. Doilies are usually rectangular in shape and each one is large enough to hold the silver, glassware, and the dishes for one person. Twelve inches by eighteen inches is a very satisfactory size. For dinner a table cloth with a pad under it is often preferred. The center fold of the table cloth is placed lengthwise in the center of the table with opposite ends of the cloth the same distance from the floor. It is well to have the cloth hang about nine inches from the edge of the table on all sides. No doilies are needed when a table cloth is used. Everyone appreciates beautiful spotless linen. A cloth or paper may be laid under the plate of small children to help them do their part in caring for the table cloth.

Review laying the table in Learning to Cook. Knives, forks, and spoons are placed in order of their use, those used first on the outside, with the exception of the dinner knife and fork which are always placed next to the plate.

TABLE SERVICE

The service for any meal should be as attractive, convenient, and efficient as is possible under the existing conditions. Service should always be in keeping with the menu, the table appointments, and the equipment on hand.

When serving your breakfast look as attractive as possible yourself. Fill water glasses ½ full just before the meal is announced. Serve hot food hot and cold food cold. A dish may be heated by letting it stand in the warming oven or in hot water. Plates should be attractive and well balanced. Have the size of the dish appropriate for the amount of food. Test seasoning before serving food. A service table or tea cart may be used to save trips to the kitchen. When the hostess starts eating it is a sign for others to follow.

Hot cocoa is placed on a mat at the right of mother's cover with cups and saucers near.

The water pitcher is placed to the left of mother's cover which makes it convenient for the person at her left to refill water glasses. It may be desirable to reverse this order for left handed people.

To illustrate the types of family service and the placing and serving of food we will use the following menu:

<table>
<thead>
<tr>
<th>Tomato Juice</th>
<th>Oatmeal</th>
<th>Plain muffins</th>
<th>Scrambled eggs</th>
<th>Bacon</th>
<th>Cocoa</th>
</tr>
</thead>
</table>

Tomato juice in a glass is placed on each plate just before the meal is announced.

Oatmeal in individual cereal dishes may be placed at each cover.

Cocoa cups and water glasses are passed at the table for refilling.

When the tomato juice is finished the glasses may be passed to mother who then places them on the service table.

The empty cereal dishes are passed in the same way. There are times when these dishes are placed in front of the individual cover and left on the table.

It is the responsibility of the hostess to see that foods are passed when needed and in the most desirable order according to use. For example, cereal is passed before sugar and cream.

Dishes containing foods which are placed on the table are passed to the right, or counter-clockwise. All food should be passed in the same direction so that no one will receive two dishes at one time. Rules for passing are based on convenience. The host or hostess may start a dish of food which has been placed on the table or may ask the one nearest it to help himself and pass it.

The dish is offered with the left hand, with the handle turned toward the person receiving it.

A person receives the dish with the right hand and transfers it to the left hand in order to serve himself with the right hand. It is then in position to be passed to the next person.

Pitchers are received and held in the right hand for serving but are transferred to the left hand before being passed to the next person at the right.

There is no one method of serving that applies to all meals or all occasions. The kind of service used for the family meal when time is limited may differ from that used when the family has more time as on Sundays and holidays. Service for a family also differs from banquet service for a large number of people.
With family type service the food is served at the table and some member of the family may wait on the table. For convenience we will use the terms Family Type Service No. 1 and No. 2.

**FAMILY TYPE SERVICE NO. 1**

The food is served at the table by the host and hostess (usually the father and mother) and members of the family may assist. A service plate is at each cover. The oatmeal and individual dishes are in front of mother’s cover.

*Serving.*—When mother serves the cereal at the table she passes it to her left, indicating that the first dish is for father. She continues until all on her left side are served and then beginning with the person at father’s left continues down her right side, serving herself last. Warmed plates would be placed near father so they may be moved to his cover before he serves the bacon and eggs.

The platter of bacon and eggs is placed on a mat above father’s cover with the serving spoon and fork at the right. He passes the first plate to the person at his left, indicating that it is for mother, then continues as mother served the cereal until all are served.

Mother pours the cocoa and passes it as she did the cereal.

**FAMILY-TYPE SERVICE NO. 2**

The food is passed around the table and each person serves himself. Breakfast plates and cereal dishes are at each cover.

The oatmeal is in front of mother’s cover.

*Serving.*—The large dish of cereal may be passed around the table and each person serves himself.

The platter containing bacon and eggs is passed around the table to the right and each person serves himself. In order to save time a family may not remove the tomato juice glasses and cereal dishes before serving the main course.

**BANQUET STYLE SERVICE**

With banquet-style service food on the individual plates is brought to the table by waiters or waitresses.

This type of service is adapted to large numbers.

The served plates are placed and later removed by a waiter or waitress who also passes foods such as jelly and muffins to each person.

Plates may be placed either to the right or left side of a person but we will use the left-hand service. Place the plate from the left with the left hand. Food such as cream, sugar, bread, jelly, and relish is passed to the left of each person.

When large numbers are being served, two waiters or waitresses may work together. One carries the tray while the other removes dishes and places them on the tray.

Any dishes containing foods that have been passed are removed before removal of individual covers.

The waitress refills water glasses and beverage cups if desired. Water glasses may be refilled without removing them from the table. If necessary to handle the glass it should be done by holding it near the bottom so that the fingers will not touch the rim.

**AFTER BREAKFAST**

Have a cleared space ready in the kitchen for the food and soiled dishes as they are removed from the table. Remove first all dishes containing food and put the food away so it is not exposed to dust. Remove soiled dishes, scrape, and stack them for washing. Place silver in separate piles. Why? Remove clean dishes that are left and arrange the table so it is attractive between meals. How would you do this in your home? Wash the dishes, sweep the kitchen, and leave it in perfect order so that mother will be glad to have you cook again.
Problem VI—Canning Vegetables

SEE equipment for canning, preparation of equipment and canning fruits in Learning to Cook.

WHY CAN?

Health.—Fruits and vegetables contain minerals and vitamins which are necessary to health. In order to have enough for the winter season we must rely on stored and canned orchard and garden products.

Economy.—It helps the family income to preserve foods when they are abundant and inexpensive for a time when they are scarce and expensive. Grow as much of the home food supply as possible.

Variety.—A greater variety means more interesting and more palatable meals.

CANNING SUCCESS

Successful canning is based on a knowledge of the causes of spoilage and also on a knowledge of methods of preventing it.

Spoilage is caused by enzymes and also by micro-organisms including bacteria, yeasts and molds. All fresh fruits and vegetables contain enzymes which cause ripening and unless their action is checked the ripening goes too far and causes decay. The low temperatures of cold storage retard the action of enzymes and the heat of cooking or canning destroys them. To prevent changes due to enzymes fruits and vegetables should be canned as soon as possible after they are gathered. “Two hours from garden to can” is a good rule. If they must be held they should be kept in small lots in a cool, well-ventilated place. Bacteria, yeasts and molds are so tiny they can be seen only with a microscope. They are found everywhere in air, water and soil. Yeasts and molds are easily destroyed by temperatures below the boiling point of water. While bacteria are growing they may be destroyed by boiling temperature but some kinds change into a spore or seed from which is difficult to kill by boiling. However if kept at 240° which is the temperature in a steam pressure canner at 10 lbs. pressure, they may be destroyed in 30 minutes. When foods are acid, as for example fruits and tomatoes, all forms of bacteria are killed within a reasonable time by boiling. With the non-acid foods, as meat and practically all vegetables except tomatoes, the spore forms of bacteria are killed only at higher temperatures.

If all micro-organisms in food are killed and it is sealed steaming hot in sterile, air tight containers, it is said to be sterilized. The application of heat to foods during canning in order to kill micro-organisms is called processing. For successful canning, it is not enough just to destroy these organisms, the food must be protected from air by sealing.

SPOILAGE

Bacteria may cause the following types of spoilage in canned foods: fermentation, flat-sour, putrefaction and botulinus spoilage.

During fermentation acid and gas are produced causing the food to become sour or “cheesy.” Tin cans may bulge or seals or jars may be broken by the gas.

Flat-sour spoilage is caused by bacteria that produce acid without gas. They grow best at temperatures about 130° to 140°F, and sometimes cause spoilage in canned foods not properly cooled after processing or held at too-high storage temperatures. Corn, peas and snap beans are subject to flat-sour spoilage.

Putrefaction caused by putrefactive bacteria is marked by gas production, a bad odor and the softening and darkening of canned food. Putrefaction usually occurs in foods low in acidity such as meats, peas and corn.

Botulinus spoilage. See page 38.

METHODS OF CANNING

Kettle processed or open kettle method:

1. Cook product in a kettle, place in a clean hot jar and seal.
2. Satisfactory for fruits and tomatoes and also for pickles in which a preservative such as vinegar or heavy syrup is used.
3. Not suitable for non-acid products.
4. Disadvantages—The product is exposed to the air after processing and air in the top of the jar is not processed. Molds or other living organisms may cause spoilage unless the temperature of the product is sufficient to destroy them.

Jar processed method in boiling water bath and pressure cooker:

1. Precook, pack hot product into jar, fill with boiling hot liquid, seal and process. When both product and liquid are hot less time is required for the contents of the jar to reach processing temperature.
2. If the product is packed into the jar cold, fill with boiling hot liquid, make a partial seal, process and make a tight seal.
3. Advantages—The safest method for non-acid products. Product keeps its shape and flavor better. Successful method because there is little chance for bacteria to enter the jar after processing. Mold is never found on jar processed products if they are properly processed and sealed.

SEALING JARS

<table>
<thead>
<tr>
<th>Jar</th>
<th>Partial seal</th>
<th>Tight Seal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screw lid</td>
<td>Tighten lid; turn back ⅛ inch.</td>
<td>Turn lid until tight.</td>
</tr>
<tr>
<td>Glass lid with wire bail and clamp</td>
<td>Snap the top bail into place and leave side clamp up.</td>
<td>Turn side clamp down.</td>
</tr>
<tr>
<td>Metal lid with composition gasket</td>
<td>Place lid, press it down around the edge and put on the wire clamp or screw ring.</td>
<td>Leave clamp or screw ring on until jar is thoroughly cold.</td>
</tr>
</tbody>
</table>

With this jar a tight seal is formed as jar cools.

STEPS IN THE JAR PROCESSED METHOD

1. Prepare jars and assemble equipment. Test, wash, rinse and boil jars, lids and rubber bands. (See directions in Learning to Cook.) It is often good
planning to test, wash and rinse jars, lids, and rubber bands the day before canning. Be sure that all equipment used in handling products for canning is clean. Soiled utensils increase the chance of spoilage.

2. Select good products. Sort or grade for size, color and ripeness. A good product is fresh and firm. Can as soon after picking as possible. If products must be kept a short time, remove any which show decay, bruises or other imperfections and keep the remainder in a cool place in small amounts, well ventilated. Select the best for canning. Imperfect fruit may be used for jam or butter if the poor spots are removed.

3. Wash and prepare according to recipe. Soil contains living organisms which are especially difficult to destroy therefore wash products thoroughly until the rinse water is clear. Remove products from water as soon as they are clean. Always lift products out of water rather than pouring water off of them.

Tomatoes are scalded in order to remove the skins easily. Ripe products are scalded in a shorter time than slightly under-ripe ones. For convenience in handling, the products may be scalded in a wire basket or piece of cheese cloth.

4. Precook or partially cook before placing in jars. Non-acid vegetables should always be precooked. Precooking removes air, shrinksthe product, makes packing easier and hastens processing because the foods are hot when placed in the canner.

The method and time of precooking varies with the product. Some products are boiled for a short time. Greens may be steamed in a tightly covered kettle with just enough water to prevent burning. Use this liquid when filling jars because it has food value. Steaming may be done in a pressure cooker. In this case leave the petcock open and do not clamp the lid.

5. Pack and seal. Remove jars one at a time from boiling water. Do not place jar on a cold surface. See that rubber is in place. When rubber curls, press it down. If necessary, remove from jar, stretch and reverse it.

If precooked, fill jar with hot product and pour boiling hot liquid over product to within ½ inch of top of jar and make a partial seal. Keep jar hot while packing by placing it in a pan of boiling water. If particles of the product remain on the rubber they should be wiped off.

6. Process required length of time.

Processing in a Pressure Cooker. Pour boiling water into the cooker until the level is just below the rack that holds the jars. Observe the water in the cooker.

Partially seal glass jars before processing them in a pressure cooker. Place each jar in the cooker as soon as packed.

When the cooker has been filled, adjust the cover and fasten securely. In case the cover is fastened by several clamps, fasten the clamps opposite each other moderately tight, one pair at a time. Then go back over the whole set and tighten each pair.

See that no steam escapes anywhere except at the petcock. If the cooker leaks steam elsewhere, use more water in the cooker.

Allow the petcock to remain open until steam escapes from it in a steady stream from 4 to 7 minutes indicating that no air remains inside. As long as there is a sputtering from the petcock all the air has not been expelled from the cooker.

Close the petcock. If much steam escapes, the cooker boils dry.

Allow the pressure to rise until the gauge registers the desired pressure.

Begin to count time when the desired pressure is reached.

Keep a uniform pressure during the processing period by carefully regulating the heat. Changes in pressure, as from ten to fifteen pounds and down again, cause a loss of liquid from the jars. A sudden drop in pressure through cooling or release of steam may also cause a loss of liquid from jars. Do not allow the pressure to go so high that the safety valve releases steam suddenly.

Do not open the petcock when there is pressure in the canner because this also releases steam suddenly.

Increase the pressure if altitude is over 2,000 feet. See page 39.

At the end of the processing period, remove the canner from the fire.

When canning in glass jars, allow the cooker to cool until the steam gauge registers zero before opening the petcock and even then open it very slowly.

Seal glass jars and place them apart so they will cool quickly to the room temperature.

Wash cooker after use and be sure to keep the safety valve dry so it will remain in good condition. Do not leave the lid shut down on the cooker when not in use. A pressure cooker should have a pressure gauge if used for canning. Check the pressure gauge frequently to be sure it is accurate. The College of Agriculture will check pressure gauges for anyone wishing this free service.

Processing in a Boiling Water Bath

Place enough water in the container to cover the lids of the jars.

After testing and washing, place jars in the processing water so they will be boiling hot when you are ready to fill them.

Seal jars filled with boiling hot product; partially seal jars filled with product below boiling temperature.

Have the water in the canner boiling before putting in the filled jars. To prevent breaking the jars should be boiling hot and be filled with hot product.

Be sure the jars are far enough apart and the rack on which they are supported is so arranged that the water can circulate freely under and around the jars.

When all the jars are in the canner, see that the level of the water comes over the lids about one or two inches. If necessary, add more boiling water so that it covers the jars throughout the processing period.

Count time as soon as the water begins to boil vigorously.

Increase the pressure, if the altitude is over 1000 feet. See page 38.

Keep the water boiling during the full processing period.

As soon as the processing time is up, remove the jars from the water one at a time and seal tightly at once.

Place jars far enough apart so they will cool quickly to room temperature.

7. Cool. Cool, avoiding cold drafts. Place jars right side up far enough apart so they will cool quickly. Do not cover with a cloth as this retards cooling. Do not disturb seal after the product is cold.

8. Label. Label with the date of canning.
9. Check results. If space permits, hold canned products at room temperature for a week or 10 days where they can be examined from time to time to be sure they are keeping. If any show signs of spoilage, examine all of that lot carefully.

10. Store. Store in a cool dry place. Protect glass jars from the light so the food will not fade. Wrap in paper or place in jar boxes. Wrapping helps to preserve color.

PROCESSING TIME

The time given for processing with the exception of water bath time for non-acid vegetables is based on Farmers' Bulletin No. 1762. The Bureau of Home Economics recommends a time which is satisfactory in all parts of the United States and advises the states to vary it according to conditions. If you have had success using a shorter time than that given for acid fruits and tomatoes, it will probably be safe to continue using it for those products. However, the following is an important precaution: Never shorten the time for processing non-acid vegetables and meats. The reason for this precaution is that products which are not acid are more difficult to keep and botulinus poison develops more readily in them than in acid products.

PRESSURE COOKER METHOD FOR NON-ACID FOODS

A steam pressure cooker is preferred for canning non-acid vegetables and meats but the boiling water bath has been used with success by careful workers. For altitudes of 2000 feet and above, the pressure cooker method should be followed. Temperatures of 240°F. to 250°F. are recommended for adequate sterilization of foods low in acidity. The water of the hot water bath never reaches a temperature above the boiling point (212°F. at sea level) and the contents of the jars will not be hotter than the water around them.

BOTULINUS POISONING

The spores of clostidium botulinum, soil organism which causes food poisoning, may not be destroyed at a temperature of 212°F. even though this temperature is maintained for at least six hours. If such spores are present, and if they survive processing and grow slowly in a sealed container, enough toxin or poison may gradually be developed to cause serious illness or even death. Enough boiling destroys the toxin but a number of deaths have been caused, for example, by eating or tasting green string beans canned in the water bath which were not boiled before tasting.

For the above reasons the Bureau of Home Economics, Washington, D. C., advises against the water bath method of canning non-acid foods. However, if a pressure cooker cannot be obtained and the water bath is used for canning non-acid foods the Bacteriology Department of the University of Nebraska has approved the processing time given in this circular.

CHANGE OF TIME FOR HIGHER ALTITUDE

Processing in Boiling Water Bath.

The times given in this table for processing in boiling water apply only to places with altitudes of 1000 feet or less. If the altitude is over 1000 feet, increase the time ten per cent for each additional 500 feet.

PROCESSING NON-ACID VEGETABLES AND TOMATOES

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>METHOD</th>
<th>Processing Time for Glass</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pressure Cooker</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 lbs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 lbs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 lbs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 lb.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25 lbs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50 lbs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>75 lbs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100 lbs.</td>
</tr>
</tbody>
</table>

Processing in Pressure Cooker

The times given for processing in the pressure cooker apply from sea level to 2000 feet. If the altitude is over 2000 feet, increase the pressure one pound for each additional 2000 feet.

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>METHOD</th>
<th>Processing Time for Glass</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pressure Cooker</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 lbs.</td>
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<tr>
<td></td>
<td></td>
<td>15 lbs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 lbs.</td>
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<tr>
<td></td>
<td></td>
<td>1 lb.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25 lbs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50 lbs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>75 lbs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100 lbs.</td>
</tr>
</tbody>
</table>

Hows and Whys for Young Cooks
PROCESSING NON-ACID VEGETABLES AND TOMATOES

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>METHOD</th>
<th>Pressure</th>
<th>Cooker</th>
<th>Water Bath</th>
<th>Pt. &amp; Qt.</th>
<th>Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peas, Green</td>
<td>Use tender young peas. Wash pods to remove spl.; shell, wash lifting peas out of water. Add hot water to cover. Simmer 5 min. Pack hot in pint jars. Cover with hot water. Add 1/2 teaspoon salt to each pint.</td>
<td>Pt.—45</td>
<td>15 lbs.</td>
<td>180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pumpkin and Squash</td>
<td>Wash, peel and cut into 1 to 1 1/2 inch cubes. Add a small amount of water and simmer until heated through, stirring occasionally. Pack hot, add 1 teaspoon salt to each quart and cover with the cooking water.</td>
<td>Qt.—70</td>
<td>45 min</td>
<td>180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetable soup mixtures</td>
<td>Combinations of vegetables for soups may include two or more of the following: tomato pulp, corn, lima beans, peas, okra, carrots, turnips, celery, onion, pimentos, and sweet and red peppers. Wash and trim the vegetables and cut into small pieces or cubes. Seasoning may include sugar, salt, white pepper, dishes of cayenne and garlic, parsley, thyme and bay leaf. Bring to boiling, pack hot, with enough liquid to cover vegetables and prevent too dense pack.</td>
<td>Qt.—70</td>
<td>5 min</td>
<td>180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tomatoes</td>
<td>Wash and scald; Cold dip. Remove core and skin. Tomatoes: Pack raw closely in jars whole or in pieces. Fill with boiling water or hot tomato juice. Add 1 tbsp. salt per quart. Or precook and pack hot. Tomato juice: Cut tomatoes into small pieces. Simmer 5 min. or until softened. Put thru a fine sieve and bring either to a boil or to 190°F. Add 1 tsp. salt to 1 qt. juice. Seal tightly in hot jars.</td>
<td>Qt.—70</td>
<td>45 min</td>
<td>180</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PRECAUTIONS IN THE USE OF CANNED FOODS

First follow directions for canning carefully, then follow the precautions below for using canned food and there need be no fear of poisoning. To be sure that food is wholesome, inspect carefully before using. If vegetables and meats are canned in a water bath, it is advisable to use them within a year after canning.

Remember, the person opening the can is responsible to those eating the product.

Before Opening

Glass Jars: The cover, if metal, should be firm and flat or curved slightly inward. There should be no sign of leakage around the rubber ring or elsewhere.

Tin Cans: Both ends should be flat or curved slightly inward. Neither end should bulge or snap back when pressed. All seams should be tight and clean, with no trace of leaks.

When Opened

The contents should appear sound, normal in color, and the liquid free from unusual cloudiness. As the can is being opened, notice whether there is an outrush of air or spurt of the liquid. These indicate spoilage. If the air sucks inward, this is a good sign and shows that the vacuum seal has not been broken.

Smell the contents at once. The odor should be characteristic of the product. Any "off" odor probably indicates spoilage. Be sure that the person opening the canned goods is able to smell.

Look at the contents carefully to see whether they appear sound and natural in color and texture.

If the can is tin, notice the appearance of the inside. It should be clean and bright, not extensively blackened or corroded.

Be absolutely safe, do not taste canned non-acid vegetables and meats before boiling.

Special Precaution

If the boiling water bath has been used, empty the canned non-acid vegetables or meat into a sauce pan and bring to a good boil. If separate and loosely packed like beans and peas, boil gently for 5 minutes but if solid like meat or pasty like corn boil 10 minutes. If the water bath method is used for non-acid foods take particular care in washing vegetables.

Boiling destroys the toxin or poison produced by certain bacteria, but does not destroy the bacteria. In case the liquid in the can is not sufficient to cover the product, add boiling water before boiling. Smell the hot food carefully because heating sometimes brings out odors not noticed in cold food.

Destroy by burning all food showing any sign of spoilage either by appearance or odor. Take no chances.

Boiling destroys toxin but does not destroy the bacteria. Don't bury spoiled products even after boiling because the bacteria continue to thrive in the soil. Don't feed spoiled products to animals even after boiling because if it is not eaten immediately there is always danger that in masses of food more of the toxin may be formed. Also, though the bacteria present may not harm the animal it would probably pollute the soil through the excretions of the animal.
JUDGING CANNED PRODUCTS

Using the Score Card

Flavor and odor are important factors in judging vegetables and fruits. However, when it is not advisable to open jars, only the first four divisions of the score card are used. Multiply each of the first four divisions by two to get total score when jars are not opened. Only in extreme cases is it advisable to open club members' jars as this would bar them from exhibiting the products again.

Score Card for Canned Vegetables and Fruits

1. Container 5%

2. Pack 10%
   Full but not crowded. Size—convenient for serving. Arrangement—attractive. No foreign matter as sand, grit, corn silk, unnecessary bits of stem, seed, core, pod, leaf, etc.

3. Liquid 10%
   Right proportion of liquid to be served with product. Should cover product and practically fill jar. As clear as possible, considering the product. Appropriate color and consistency. Not discolored, mushy or unnecessarily cloudy. No bubbles indicating spoilage.

4. Appearance and texture—judged before opening 25%
   Color—characteristic of cooked product. Not unnecessarily blanched or darkened. Quality—good original product, canned at proper state of maturity. Not under-ripe, over-ripe, tough, hard, woody or stringy. Firm with no defects. Shape—well preserved, not over- or under-cooked, frayed or mushy. Texture—more accurately judged by tasting. Uniformity—size of pieces uniform, uniform maturity.

5. Flavor and odor—judged after container is opened 50%
   Pleasing flavor—characteristic of fresh cooked product. No suggestion of staleness, under- or over-ripeness, under- or over-cooking or spoilage.

Total score 100%

FAMILY CANNING AND STORAGE BUDGET*

For 36 Non-Growing Weeks

<table>
<thead>
<tr>
<th>Vegetables</th>
<th>Average for one adult</th>
<th>My Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beans</td>
<td>6 qt.</td>
<td>7 lb. dried</td>
</tr>
<tr>
<td>Beets</td>
<td>4 qt.</td>
<td>6 lb.</td>
</tr>
<tr>
<td>Cabbage</td>
<td>4 qt. kraut</td>
<td>20 lb.</td>
</tr>
<tr>
<td>Carrots</td>
<td>4 qt.</td>
<td>12 lb.</td>
</tr>
<tr>
<td>Corn</td>
<td>5 qt.</td>
<td>1 lb. dried</td>
</tr>
<tr>
<td>Greens</td>
<td>7 qts.</td>
<td></td>
</tr>
<tr>
<td>Onions</td>
<td></td>
<td>10 lb.</td>
</tr>
<tr>
<td>Parsnips &amp; Turnips</td>
<td></td>
<td>14 lb.</td>
</tr>
<tr>
<td>Peas</td>
<td>6 qt.</td>
<td></td>
</tr>
<tr>
<td>Potatoes</td>
<td>120 lb.</td>
<td></td>
</tr>
<tr>
<td>Pumpkin</td>
<td>5 lb.</td>
<td></td>
</tr>
<tr>
<td>Squash</td>
<td>5 lb.</td>
<td></td>
</tr>
<tr>
<td>Tomatoes</td>
<td>See Fruits</td>
<td></td>
</tr>
</tbody>
</table>

Fruits

<table>
<thead>
<tr>
<th>Fruit</th>
<th>Average for one adult</th>
<th>My Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples</td>
<td>10 qt.</td>
<td>1 bu.</td>
</tr>
<tr>
<td>Berries</td>
<td>7 qt.</td>
<td></td>
</tr>
<tr>
<td>Cherries</td>
<td>4 qt.</td>
<td></td>
</tr>
<tr>
<td>Peaches</td>
<td>6 qt.</td>
<td></td>
</tr>
<tr>
<td>Pears</td>
<td>3 qt.</td>
<td></td>
</tr>
<tr>
<td>Plums</td>
<td>4 qt.</td>
<td></td>
</tr>
<tr>
<td>Rhubarb</td>
<td>2 qt.</td>
<td></td>
</tr>
<tr>
<td>Tomatoes</td>
<td>18 qt.</td>
<td></td>
</tr>
</tbody>
</table>

* In emergency times it would be well to increase the amounts given on the canning budget. See basis for figuring family budget.

Basis for Figuring Family Budget

Boy, 14 to 17 years 1/2 more than adult budget
Girl, 13 to 17 years Same as adult budget
Child 8 to 12 years 3/4 of adult budget
Child, 4 to 7 years 1/4 of adult budget (Minus corn, onion, cabbage)
Child under 4 years 1/4 of adult budget (Minus corn, onion, cabbage)

Number of Servings

1 pound root vegetables, greens or cabbage 3 servings
1 quart canned vegetables and fruits 8 servings

Size of Servings

1/2 cup for canned fruits and vegetables.

Amounts

Included in the budget is about 10 per cent for such emergencies as company, breakage, and spoilage.
Relishes and pickles help to make the diet more palatable, so if possible, preserve these as extra vegetables or fruits.
Quantities are based on a moderate cost diet which allows one serving daily of potatoes, one serving daily of fresh or stored vegetables, one serving daily of canned vegetables, one serving daily of citrus fruit, other fresh fruit or canned tomatoes and one serving daily of canned fruit.

Tomatoes may be used as a vegetable but the amount given was figured on the basis of one-half the following requirement of "one serving of tomatoes or citrus fruit."

If desired the amounts of stored vegetables may be increased thus making it possible to decrease the amount of canned vegetables. Dried and additional stored fruit may be used to decrease the amount of canned fruit.