COMPILATION

OF

HOUSEHOLD SCIENCE

RYAN

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1913

"The great thing in this world is not so much where we stand as in what direction we are moving."

"Discover a common ground—something that everybody knows something about. Begin there."

PREFACE

It is a truth invariably that no one is wholly independent of circumstances, and that environment will determine both one's place in history and their degree of success in life.

Each day comes freighted with greater opportunities and enlarged interests, so as to meet these constantly increasing responsibilities; our lives should be developed along practical lines, to keep abreast of the times in modern achievement.

Scientific Cookery

Scientific Cookery is an exact science based upon the chemistry of foods.

Food is anything that supplies nourishment, repair and energy to the body.

Food of every description is wholesome and digestible in proportion as it approaches nearer the state of complete or perfect digestion.

The process by which food is prepared or changed from a raw to a finished state is by heat, applicable in various forms.

Food is consumed through the functions of the various organs in the body by the alchemy of nutrition.

The preparation of human food so as to make it wholesome, nutritious and agreeable is the art upon which the physical well being of man is dependent.

The outline of the following lessons and compilations are such as those taught in the Seventh and Eighth grades of the Public Schools, also in the intermediate classes of the Y. W. C. A. in its various institutions.

However, in their present form they have been revised and enlarged so as to meet the requirements of the advanced student as well as the intermediate and juvenile classes, so as to make them applicable in laying a foundation for a scientific course of home study and Domestic Science Club work.

U. S. Department of Agriculture
Office of Experiment Stations
A. C. True, Director

Prepared by
C. F. LANGWORTHY
Expert in charge of Nutrition Investigations

Dietary Standards

DIETARY STANDARD FOR MAN IN FULL VIGOR AT MODERATE MUSCULAR WORK

Condition Considered	Protein	Energy
	Grams	Calories
Food as purchased	115	3,800
Food eaten	100	3,500
Food digested	95	3,200

ESTIMATED AMOUNT OF MINERAL MATTER REQUIRED PER MAN PER DAY

	Grams
Phosphoric acid ($H_3P.O_4$)	3 to 4
Sulphuric acid ($H_2S.O_4$)	2 to 3.5
Potassium oxid	2 to 3
Sodium oxid	4 to 6
Calcium oxid	0.7 to 1.0
Magnesium oxid	0.3 to 0.5
Iron	0.006 to 0.012
Chlorin	6 to 8

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Functions and Uses of Food

CONSTITUENTS OF FOOD

FOOD AS PURCHASED CONTAINS
- EDIBLE PORTION — Flesh of meat, yolk and white of eggs, wheat flour, etc
  - Water
  - Nutrients
    - Protein
    - Fats
    - Carbohydrates
    - Mineral Matter Or Ash
- REFUSE — Bones, entrails, shells, bran, etc.

USE OF FOOD IN THE BODY

PROTEIN.....Builds and repairs tissue
White (albumen) of eggs, curd (casein) of milk, lean meat, gluten of wheat, etc.

FATS.....Are stored as fat
Fat of meat, butter, olive oil, oils of corn and wheat, etc.

CARBOHYDRATES...Are transformed into fat, sugar, starch, etc.

All served as fuel to yield energy in the forms of heat and muscular power.

MINERAL MATTER OR ASH..Share in forming bone, assists in digestion, etc.
Phosphates of lime, potash, soda, etc.

Food is that which, taken into the body, builds tissue or yields energy

Food Outline

ORGANIC

I. PROTEIDS

1. Albumen — Eggs; Meat; Fish
2. Casein
   - Animal — Milk; Cheese
   - Vegetable — Peas; Beans; Lentils; Peanuts
3. Gluten—Cereals
4. Gelatine—Bones and Fish
5. Fibrine—Muscle of Meat

Use—To build up tissue and repair worn out tissue.

II. CARBOHYDRATES

1. Starch — Cereals; Vegetables
2. Sugar — Fruits; Vegetables; Sugar

III. FATS AND OILS

1. Butter
2. Cream
3. Fat of Meat
4. Fish
5. Cereals
6. Nuts
7. Olive Oil

Use—To furnish energy and maintain heat.

INORGANIC

I. MINERAL MATTER

1. Sodium
2. Iron
3. Lime
4. Potash
5. Sulphur

Use—To build up bone and other tissue, to aid digestion, to purify the blood.

II. WATER

Use
1. Regulates temperature
2. Aids in carrying off waste
3. Acts as a carrier
4. Aids in digestion
5. Acts as a solvent

TABLE SET FOR BREAKFAST

"A Breakfast in June," by Mary L. Wade

—*National Food Magazine.*

Laying the Table

A table should look as neat and attractive as possible. Place silence cloth with nap up, and draw it straight and even. Lay the table cloth with the middle fold in the center of the table. See that the ends and corners are even. Place everything straight upon the table. Turn no dishes upside down.

When the waiter passes the food to each person, it should be passed on the left side of the person. In placing a dish in front of a person, the waiter should stand at the right.

Beverages and food served individually should be placed at the right.

To clear the table remove all dishes from each place, then the meat and vegetables.

Remove crumbs from cloth before bringing in desert.

Position of Host and Hostess—Position of Host at the head of the table near entrance door; Hostess at the foot of the table opposite.

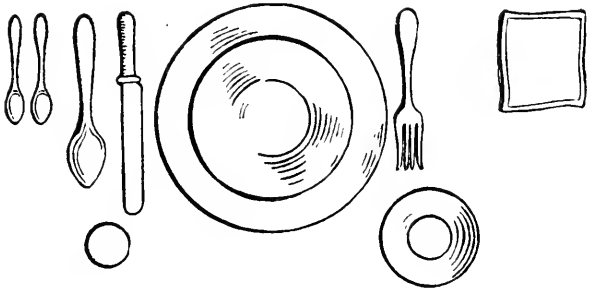
Placing knives, forks and spoons—Place the knife or knives at the right of each place, the sharp edge toward the plate, the fork or forks at the left, tines up, one inch from the edge, being careful to have the spacing the same at every place. Spoons at right of knife, bowls up.

Placing of Glasses—Place the water glass at right of plate, at end of knife blade.

Placing Napkins, Pepper, Salt—Place napkins at left of plate, pepper and salt near corners, or one of each between the places for two people.

Sideboard and Side-table—Object to hold all extras that may be needed during a meal.

Specific directions for home and table decorations given in class.



A COOKING LESSON AT FREDERICK DOUGLAS CENTER CHICAGO.

—*National Food Magazine.*

Housekeeping

DIRECTIONS FOR DISH-WASHING:

1. Have the dishes scraped.

2. Pile all articles of each kind together; plates by themselves, the largest at the bottom; cups by themselves; silver articles together, and steel knives and forks by themselves.

3. Use hot, soapy water.

SOAKING DISHES:

Cold water should be used for soaking dishes which have been used for milk, eggs and starchy foods. Hot water for dishes used for sugar substances and for sticky, gummy substances like gelatine. Greasy dishes of all kinds, including knives, are more easily cleaned if first wiped with soft paper, which should be burned.

ORDER:

1. Glassware; 2. Silver; 3. Cups and saucers; 4. Plates; 5. Platters, vegetable dishes, etc.; 6. Cooking utensils (if not washed first).

Rinse all dishes in clean, hot water (except cut glass), drain and wipe with clean, dry towels.

CARE OF THE SINK.

When dish-washing is finished, wash every part of the sink with hot, soapy water. Wash above and around the sink. Use a skewer to clean behind the sink pipes.

Flush the sink with boiling water every day and about once a week with a strong solution of washing soda.

Use mauric acid on a swap stick, for removing collected waste and dirt on the porcelain basin, also a strong solution of soap suds with a small amount of gasoline added is a most excellent cleansing agent for the bath-room.

SWEEPING.

HOW TO SWEEP:

Before beginning to sweep, see that no food is left uncovered in the room. Sweep from the edges of the room toward the center. Sweep with short strokes, keeping the broom close to the floor. Turn it edgewise to clean cracks. Always sweep a floor before washing or scrubbing it.

DUSTING:

Dust the wood work, furniture and movable articles with a soft, sanitary, absorbent cotton cloth. Shake it frequently out of the windows. Commence at the highest articles and work down.

Household Acids

By Margaret Soundstrom.

Keep acids away from iron.
Keep acids away from children.

That the art of good housekeeping and science of chemistry are very nearly related, is a fact that many housekeepers do not appreciate as fully as they might.

It is not our purpose to treat the many phases of household chemistry, but to turn to use some of the acids which are daily used in the average household.

Oxalic acid, which is very poisonous, is sold in the form of white crystals which readily dissolve in water. Brass and copper can be quickly and effectively cleaned with this acid because it acts chemically on the tarnish, removing it instantly. Tarnish is a deposit on a metal caused by the chemical action of the oxygen and dampness of the atmosphere. When the acid is applied to this tarnish it dissolves the deposit and leaves the surface clear. After the tarnish is removed, every bit of the acid must be rubbed off with a dry cloth on which have been dropped a few drops of sweet oil, else dangerous green salts will be formed on the metal which might be thoughtlessly rubbed off on the hands.

Oxalic acid is also used for removing ink-stains on carpets, table covers, and even white materials. There are many kinds of inks, some containing iron compounds and some aniline and allied substances. Oxalic acid will not remove aniline ink-stains, but it will remove the iron. As it is impossible for the average person to tell what sort of ink has been spilled, it is always well to give the acid a trial. Fill a medicine dropper, and apply it drop by drop; if the stain contains iron it will disappear. To neutralize the further action of the acid on the cloth the material should then be dipped in ammonia and water (one part ammonia to ten of water), and then rinsed in clear water. If the material is colored and the acids have caused it to fade, the ammonia and water will doubtless restore the color.

Like oxalic acid in its effect on brass and copper, is the acid in vinegar known as acetic acid, produced by the alcoholic fermentation of the sugar in the cider, and by those minute organisms which form the "mother" of vinegar.

For the cleaning of metals, it is better to buy a small quantity of the pure acetic acid and dilute it with water (one of acid to twenty of water), rather than use vinegar the other ingredients of which often leave a discoloration. After cleaning brass and other metals with this acid, the surface should be thoroughly washed with ammonia and water. To clean brass water faucets such as are frequently found in kitchen sinks, ordinary vinegar will do very well, care being taken to rinse it all off afterwards.

Acids as disinfectants do not seem to suggest themselves very much to the average housewife because there are so many profusely advertised alkalies put up and ready for use. These all have their value, but equally effective, and convenient always to have on hand are one or two of the standard acids. The intelligent use of carbolic acid, in disinfecting white fabrics, colored materials, metals, woods, and the like, would be of great saving to the wife and mother who has had to deal with a case of contagious disease. Used for disinfecting bedding and bed clothes it kills the germ spores in their vegetative stage and if used in its proper strength (one of acid to twenty of water), it will not injure fabrics in the least. All bed clothes and clothing from an infectious disease should be immersed in a bath of water and carbolic and then sent to the laundry. If by chance the family cat is also included in the sick list and shows signs of mange, two or three drops of the acid on some vaseline rubbed into the affected part will work wonders in healing the skin and causing new fur to grow. The vaseline should be covered by a clean linen rag and securely tied on.

One of the most useful acids that can be put into use in the home is hydrochloric acid, familiarly known as muriatic acid. Powerful though it is, this acid is one of the most commonly used chemicals in the industrial world; why not then take advantage of its usefulness in the daily operations of the home? It is a most familiar sight to all housekeepers to see their white porcelain sinks, tubs and hoppers discolored with yellowish brown stains, which they vainly try to scrub off with sand soap or a washing powder. The brown stains are caused by the iron in the water supply, and, as this iron is oxidized on to the porcelain by the action of the atmosphere, abrasive materials (sand soap and so forth), while they may take off some of it, do not accomplish their purpose nearly as well as hydrochloric acid which acts chemically on the iron deposit and completely removes the stains. To clean such spots take one part concentrated hydrochloric acid to ten parts water, about two tablespoons to twenty tablespoons of water is a good amount—and with a small dish mop, wash off the stains with the liquid. Rinse with clear water and then wash around wherever the acid had been with some washing soda dissolved in water to neutralize the acid and prevent any injurious action which it might have on the waste pipes. This acid should not touch the hands, as it is injurious to the skin.

From this use of hydrochloric acid it is very evident that it is an enemy of iron rust wherever it may be found, therefore in no part of the house is it more useful than in the laundry, where spots of rust will make their appearance from one or another of many causes. To remove these spots spread the stained portion of material over a bowl containing one quart of water in which one teaspoonful of borax has been dissolved. With a medicine dropper allow the undiluted hydrochloric acid to drop in the spot, one drop at a time until the rust brightens, then dip the material quickly into the bowl of borax and water. If the spot is not entirely gone, repeat the same process over again until it disappears, then rinse in clear water several times.

The acid in lemons, called citric acid, can be used in many ways in the household, for removing tarnish from metals and stains on bric-a-brac and picture frames, especially brass of delicate workmanship. The use of lemon juice should always be followed by rinsing with ammonia and water. Because the juice contains a natural acid it is both convenient and harmless though great care should be taken to dispose of the lemons as soon as they have been used. Citric acid is often used as a substitute for lemon juice in making lemonade as well as for lemon flavorings in cooking.

Milk has been long resorted to as a remedy for removing stains though most people are so impatient to get all the ink out at once that they waste a great deal of milk without getting very good results. If ink has been spilled on a fabric remove all the ink possible with a spoon, and then use a small sponge. Take a medium size bowl or deep dish and put the stained portion of the material in it, then pour on enough milk to entirely cover it over. Let it stand for at least an hour and if the milk is very discolored pour it off and replenish with a fresh supply. Put the bowl and the stained fabric in a warm place such as would be selected for raising bread dough and leave it there until the milk has soured. The chemical action of the lactic acid ferment in the milk, as it sours, will have removed the ink much more effectively than if quantities of fresh milk had been used. If the stain is not entirely gone the process can be repeated until it disappears entirely when it will be found that the fibres of the fabric have remained uninjured.

The souring of milk suggests to many women nothing further than the idea that the milk has spoiled and should be thrown away. Some thrifty housewives, especially those who live in country districts, use this milk with soda in baking their gingerbread. But the souring of milk, caused by lactic fermentation, produces lactic acid for which there are innumerable uses. Sour milk therefore should never be despised in the household; the acid in it is valuable to the health and if there is no one willing to drink it just as it is, a very palatable beverage can be made by adding carbonated water and a little chopped ice.

—*American Sunday Monthly Magazine.*

The Decoration of the Home

Mrs. James C. Bradford delivered the following address before the Homemakers' Association:

In considering the beauty of the home, the location, the construction, and its relation to the outside, environments must not be overlooked.

The interior decoration and the construction of the house must conform to all the requirements of the decorator—for good interior decoration has its beginning in good architecture. A room which has good lines, good proportion, requires less decoration, and looks much better than one not so constructed.

Proportion is "good breeding in architecture." There are a few fundamental principles of artistic decoration which one must consider. Proportion of room, its location and its color harmony. In the room to be decorated there must first be good lines. If the room is too high the effect of lowering the ceiling may be attained by allowing the ceiling paper to be dropped to meet the wall paper, and put a picture moulding where the ceiling paper and the wall paper meet. A low ceiling may be made to look higher by using a striped paper from baseboard to ceiling, but one must avoid big stripes, as stripes must be unobtrusive and of same color-tone as background of paper.

Limiting door space adds to the wall paper. After line and proportion comes color scheme. The color treatment of a room depends upon the quantity and the quality of the light in the room and its location. Harmony and appropriateness are to be carefully watched in the selection of colors. Harmony in color is the selection of colors somewhat in the same tone, or of contrasting colors of the same depth of tone. Contrasting colors emphasize each other. Red, green and blue are the primary colors. A knowledge of complementary colors is important. Colors when combined should make a harmonious tone, altogether harmonious and pleasing to the eye. These colors form the strongest contrast. There are cool colors, such as blues in various grades, grays and apple greens; the warm colors are the reds, golden browns, pure gold, olive green.

Colors are also classified as grave, gay, or sober. In the selection of color schemes for a room, one must first consider the harmonious whole, which depends upon the background. In a room in which the walls are colored bright red, and the floor covered with a bright green rug, the contrast between the two will make both stand out and will be offensive to the eye. If the background of the floor and the walls is so striking, it is difficult to have furnishings blend with the color. Better to have one prevailing color as the

predominant tone, or rather, two contrasting ones. The background depends upon the floor color, the wall color and the hangings. In selecting these colors we must be guided by what is called graduation of color. The strongest color should begin at the base, which is the floor. The walls should represent the next lighter color, and the ceilings the last and third lightest color in the graduation. Therefore, the floor, wall and ceiling should have a certain relation to each other, as they are the setting or background of the furnishing, which includes furniture, curtains and other accessories in the decorations. Hangings and furniture cover should blend into the walls and the floor.

In summing up the principles and rules of good taste in furnishings and decoration there are a few simple rules that should guide one. Simplicity of treatment, floor covering, the size of the room, height of ceiling and location of the room, and all that pertains to cleanliness and sanitary conditions. Simplicity is the first law of good taste. The Japanese understood this to a very great degree. The bric-a-brac and dust catching articles were kept in cupboards.

In decorating begin with the fixed stationary parts, floor, walls, ceiling. Furniture, draperies, pictures, bric-a-brac are used to complete the picture. To secure good results, attend first to the floor. It is the foundation color. Carpet, if used, should conform to the conditions of the room. The size of the room will determine the size of the figure in the carpet. Have your design restful to the eye. Bare floors with rugs are much more sanitary and pleasing. Furniture should conform to the room and its uses. The choice of furniture is determined by the use to which the room is to be put. The cost of an article of furniture is not the measure of its value. Pictures not alone adorn the home, but should be selected for the development of the taste and character of the family. Good photographs and good prints help to educate the taste of the child. Framing and hanging of pictures are essential. Pictures are more desirable than bric-a-brac.

Plants and flowers add much to the beauty, grace and harmony of the decoration. Window boxes add much to the beauty and pleasure of the home.

Appropriateness and the eternal fitness of things should always be considered in the decoration. One beautiful picture, comfortable chairs, a table that will hold something, will add to the simplicity and comfort of the house. Above all things, study comfort and the restfulness of the home, for it is the place where the good man, after the day's labor is over, goes for rest and comfort.

Average Composition of American Food Products

Langworthy's Standard

Food materials (as purchased). ANIMAL FOODS	Refuse	Water	Protein	Fat	Carbohydrates	Ash	Fuel value per pound
BEEF, FRESH:	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Cals.
Chuck, including shoulder..	17.3	54.0	15.8	12.5	....	0.7	791
Chuck ribs	19.1	53.8	15.3	11.1	....	.8	726
Flank	5.5	56.1	18.6	19.9	....	.8	1,141
Loin	13.3	52.9	16.4	16.9	....	.9	980
Porterhouse steak	12.7	52.4	19.1	17.9	....	.8	1,069
Sirloin steak	12.8	54.0	16.5	16.1	....	.9	949
Ribs	20.1	45.3	14.4	20.0	....	.7	1,069
Round	8.5	62.5	19.2	9.2	....	1.0	720
BEEF, CORNED, CANNED, PICKLED AND DRIED:							
Corned beef	8.4	49.2	14.3	23.8	....	4.6	1,220
Tongue, pickled	6.0	58.9	11.9	19.2	....	4.3	991
Dried, salted and smoked...	4.7	53.7	26.4	6.9	....	8.9	757
VEAL:							
Breast	23.3	52.5	15.7	8.2	....	.8	616
Leg	11.7	63.4	18.3	5.8	....	1.0	566
Leg cutlets	3.4	68.3	20.1	7.5	....	1.0	667
MUTTON:							
Flank	9.9	39.0	13.8	36.9	....	.6	1,740
Leg, hind	17.7	51.9	15.4	14.5	....	.8	865
Shoulder	22.1	46.8	13.7	17.1	....	.7	939
LAMB:							
Breast	19.1	45.5	15.4	19.1	....	.8	1,050
Leg, hind	13.8	50.3	16.0	19.7	....	.9	1,086
PORK, FRESH:							
Flank	18.0	48.5	15.1	18.6	....	.7	1,025
Ham	10.3	45.1	14.3	29.7	....	.8	1,458
Loin chops	19.3	40.8	13.2	26.0	....	.8	1,289
Shoulder	12.4	44.9	12.0	29.8	....	.7	1,421
Tenderloin	....	66.5	18.9	13.0	....	1.0	868
PORK, SALTED, CURED AND PICKLED:							
Ham, smoked	12.2	35.8	14.5	33.2	....	4.2	1,603
Shoulder, smoked	18.9	30.7	12.6	33.0	....	5.0	1,561
Salt pork	....	7.9	1.9	86.2	....	3.9	3,514
Bacon, smoked	8.7	18.4	9.5	59.4	....	4.5	2,570
SAUSAGE:							
Bologna	3.3	55.2	18.2	19.7	....	3.8	1,126
Farmer	3.9	22.2	27.9	40.4	....	7.3	2,137
Frankfort	....	57.2	19.6	18.6	1.1	3.4	1,126
SOUPS:							
Celery, cream of	....	88.6	2.1	2.8	5.0	1.5	242
Beef	....	92.9	4.4	.4	1.1	1.2	116
Meat stew	....	84.5	4.6	4.3	5.5	1.1	357
Tomato	....	90.0	1.8	1.1	5.6	1.5	179
POULTRY:							
Chicken, broilers	41.6	43.7	12.8	1.4	....	.7	289
Fowls	25.9	47.1	13.7	12.3	....	.7	745
Goose	17.6	38.5	13.4	29.8	....	.7	1,446
Turkey	22.7	42.4	16.1	18.4	....	.8	1,035
FISH:							
Cod, dressed	29.9	58.5	11.1	.2	....	.8	209
Halibut, steaks or sections..	17.7	61.9	15.3	4.4	....	.9	455
Mackerel, whole	44.7	40.4	10.2	4.2	....	.7	355
Perch, yellow, dressed	35.1	50.7	12.8	.7	....	.9	260
Shad, whole	50.1	35.2	9.4	4.8	....	.7	364
Shad, roe	....	71.2	20.9	3.8	2.6	1.5	580
FISH, SALT: Cod	24.9	40.2	16.0	.4	....	18.5	306

Average Composition of American Food Products—Continued

Food materials (as purchased). ANIMAL FOODS	Refuse Per ct.	Water Per ct.	Protein Per ct.	Fat Per ct.	Carbohydrates Per ct.	Ash Per ct.	Fuel value per pound Cals.
FISH, CANNED:							
Salmon	14.2	56.8	19.5	7.5	....	2.0	657
Sardines	5.0	53.6	23.7	12.1	....	5.3	918
SHELLFISH:							
Oysters, "Solids"	....	88.3	6.0	1.3	3.3	1.1	221
Clams	....	80.8	10.6	1.1	5.2	2.3	331
Crabs	52.4	36.7	7.9	.9	.6	1.5	191
Lobsters	61.7	30.7	5.9	.7	.2	.8	139
EGGS: Hen's eggs	11.2	65.5	13.1	9.3	....	.9	613
DAIRY PRODUCTS, ETC.							
Butter	....	11.0	1.0	85.0	....	3.0	3,450
Whole milk	....	87.0	3.3	4.0	5.0	.7	312
Skim milk	....	90.5	3.4	.3	5.1	.7	166
Buttermilk	....	91.0	3.0	.5	4.8	.7	162
Condensed milk	....	26.9	8.8	8.3	54.1	1.9	1,476
Cream	....	74.0	2.5	18.5	4.5	.5	874
Cheese, Cheddar	....	27.4	27.7	36.8	4.1	4.0	2,063
Cheese, full cream	....	34.2	25.9	33.7	2.4	3.8	1,874
VEGETABLE FOOD.							
FLOUR, MEAL, ETC.:							
Entire-wheat flour	....	11.4	13.8	1.9	71.9	1.0	1,632
Graham flour	....	11.3	13.3	2.2	71.4	1.8	1,626
Wheat flour, patent roller process—							
High grade and medium	....	12.0	11.4	1.0	75.1	.5	1,610
Low grade	....	12.0	14.0	1.9	71.2	.9	1,623
Crushed wheat	....	10.1	11.1	1.7	75.5	1.6	1,640
Buckwheat flour	....	13.6	6.4	1.2	77.9	.9	1,578
Corn meal	....	12.5	9.2	1.9	75.4	1.0	1,612
Oatmeal	....	7.3	16.1	7.2	67.5	1.9	1,808
Rice	....	12.3	8.0	.3	79.0	.4	1,591
Tapioca	....	11.4	.4	.1	88.0	.1	1,608
Starch	....	....	....	....	90.0	....	1,633
BREAD, PASTRY, ETC.:							
White bread	....	35.3	9.2	1.3	53.1	1.1	1,183
Brown bread	....	43.6	5.4	1.8	47.1	2.1	1,025
Graham bread	....	35.7	8.9	1.8	52.1	1.5	1,179
Whole-wheat bread	....	38.4	9.7	.9	49.7	1.3	1,114
Rye bread	....	35.7	9.0	.6	53.2	1.5	1,153
Cake	....	19.9	6.3	9.0	63.3	1.5	1,626
Cream Crackers	....	6.8	9.7	12.1	69.7	1.7	1,929
Oyster crackers	....	4.8	11.3	10.5	70.5	2.9	1,908
Soda crackers	....	5.9	9.8	9.1	73.1	2.1	1,872
Molasses	....	25.1	2.4	....	69.3	3.2	1,301
Candy	....	....	....	....	96.0	....	1,742
Honey	....	18.2	.4	....	81.2	.2	1,481
Sugar, granulated	....	....	....	....	100.0	....	1,814
Maple syrup	....	....	....	....	71.4	....	1,295
VEGETABLES:							
Beans, dried	....	12.6	22.5	1.8	59.6	3.5	1,562
Beans, Lima, shelled	....	68.5	7.1	.7	22.0	1.7	556
Beans, string	7.0	83.0	2.1	.3	6.9	.7	175
Beets	20.0	70.0	1.3	.1	7.7	.9	167
Cabbage	15.0	77.7	1.4	.2	4.8	.9	121
Celery	20.0	75.6	.9	.1	2.6	.8	68
Corn, green (sweet), edible portion	....	75.4	3.1	1.1	19.7	.7	458
Cucumbers	15.0	81.1	.7	.2	2.6	.4	68
Lettuce	15.0	80.5	1.0	.2	2.5	.8	72
Mushrooms	....	88.1	3.5	.4	6.8	1.2	203

Average Composition of American Food Products—Continued

Food materials (as purchased).	Refuse	Water	Protein	Fat	Carbohydrates	Ash	Fuel value per pound
VEGETABLE FOOD.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Cals.
Onions	10.0	78.9	1.4	.3	8.9	.5	199
Parsnips	20.0	66.4	1.3	.4	10.8	1.1	236
Peas (Pisum sativum), dried	....	9.5	24.6	1.0	62.0	2.9	1,612
Peas (Pisum sativum), shelled	....	74.6	7.0	.5	16.9	1.0	454
Cowpeas, dried	....	13.0	21.4	1.4	60.8	3.4	1,548
Potatoes	20.0	62.6	1.8	.1	14.7	.8	303
Rhubarb	40.0	56.6	.4	.4	2.2	.4	63
Sweet potatoes	20.0	55.2	1.4	.6	21.9	.9	448
Spinach	....	92.3	2.1	.3	3.2	2.1	108
Squash	50.0	44.2	.7	.2	4.5	.4	102
Tomatoes	....	94.3	.9	.4	3.9	.5	103
Turnips	30.0	62.7	.9	.1	5.7	.6	124
VEGETABLES, CANNED:							
Peas (Pisum sativum), green	....	85.3	3.6	.2	9.8	1.1	251
Corn, green	....	76.1	2.8	1.2	19.0	.9	444
Tomatoes	....	94.0	1.2	.2	4.0	.6	102
FRUITS, BERRIES, ETC., FRESH:							
Apples	25.0	63.3	.3	.3	10.8	.3	214
Bananas	35.0	48.9	.8	.4	14.3	.6	290
Grapes	25.0	58.0	1.0	1.2	14.4	.4	328
Lemons	30.0	62.5	.7	.5	5.9	.4	140
Muskmelons	50.0	44.8	.3	....	4.6	.3	89
Oranges	27.0	63.4	.6	.1	8.5	.4	169
Pears	10.0	76.0	.5	.4	12.7	.4	256
Persimmons, edible portion	....	66.1	.8	.7	31.5	.9	614
Raspberries	....	85.8	1.0	....	12.6	.6	247
Strawberries	5.0	85.9	.9	.6	7.0	.6	168
Watermelons	59.4	37.5	.2	.1	2.7	.1	57
FRUITS, DRIED:							
Apples	....	28.1	1.6	2.2	66.1	2.0	1,317
Apricots	....	81.4	.9	....	17.3	.4	330
Dates	10.0	13.8	1.9	2.5	70.6	1.6	1,416
Figs	....	18.8	4.3	.3	74.2	2.4	1,437
NUTS:							
Almonds	45.0	2.7	11.5	30.2	9.5	1.1	1,600
Beechnuts	40.8	2.3	13.0	34.0	7.8	2.1	1,750
Brazil nuts	49.6	2.6	8.6	33.7	3.5	2.0	1,580
Butternuts	86.4	.6	3.8	8.3	.5	.4	413
Chestnuts, fresh	16.0	37.8	5.2	4.5	35.4	1.1	918
Chestnuts, dried	24.0	4.5	8.1	5.3	56.4	1.7	1,384
Cocoanuts	48.8	7.2	2.9	25.9	14.3	.9	1,358
Cocoanut, prepared	....	3.5	6.3	57.4	31.5	1.3	3,003
Filberts	52.1	1.8	7.5	31.3	6.2	1.1	1,512
Hickory nuts	62.2	1.4	5.8	25.5	4.3	.8	1,213
Pecans, polished	53.2	1.4	5.2	33.3	6.2	.7	1,551
Peanuts	24.5	6.9	19.5	29.1	18.5	1.5	1,864
Piuon (Pinus edulis)	40.6	2.0	8.7	36.8	10.2	1.7	1,829
Walnuts, California, black	74.1	.6	7.2	14.6	3.0	.5	774
Walnuts, California, soft-shell	58.1	1.0	6.9	26.6	6.8	.6	1,322
Raisins	10.0	13.1	2.3	3.0	68.5	3.1	1,406
MISCELLANEOUS:							
Chocolate	....	5.9	12.9	48.7	30.3	2.2	2,750
Cocoa, powdered	....	4.6	21.6	28.9	37.7	7.2	2,242
Cereal coffee infusion (1 part boiled in 20 parts water)	....	98.2	.2	....	1.4	.2	29

National Food Magazine.

Milk

COMPOSITION

	Water	Protein	Fat	Carbohydrates	Ash
	Percent.	*Percent.*	*Percent.*	*Percent.*	*Percent.*
Whole Milk	87.0	3 3	4 0	5.0	0 7
Skim Milk	90 5	3.4	.3	5 1	.7

Milk is preserved by a low temperature, ranging from forty to fifty degrees. Fresh milk will maintain its sweetness of flavor and quality of content from 24 to 36 hours at temperature as above stated, where it has been produced and handled under sanitary conditions.

What causes milk to sour?

Milk is made sour by a group of bacteria organisms known as lactic acid bacteria. They act on the sugar of the milk which forms the acid.

Milk that has changed may be sweetened or rendered fit for use again by stirring in a little soda.

Salt will curdle new milk, hence in preparing porridge, gravies, etc., salt should not be added until the dish is prepared.

MILK—General Rules.

Vessels used for milk must be thoroughly cleansed; tins should be rinsed in luke-warm water and washed thoroughly with hot water and soap, then rinsed in boiling water. Cover milk with muslin and keep in a cool place. Milk may be pasteurized to destroy disease germs.

PASTEURIZED MILK.

Fill sterile bottles or jars nearly full of milk, cork them with baked cotton, place on rings in a deep pan and fill with cold water so that the water may be as high outside the jars as the milk is inside, place the pan over the fire and heat until small bubbles appear around the top of the milk (about 155° F.); remove to the back of the fire and allow the bottles to stand there 15 m., then reduce the temperature as quickly as possible, and when milk is cold remove the bottles from the water and keep in a cold place. In summer milk should be pasteurized twice a day for babies.

Rules for Custards

The eggs should be thoroughly mixed, but not beaten light, the sugar and salt added to these and the hot milk added slowly. Custards must be cooked over a moderate heat; if a custard curdles put it in a pan of cold water and beat until smooth. Use the yolks instead of the whole eggs to make a soft custard.

SOFT CUSTARD

1 pt. milk, scalded,	¼ t. salt,
4 T. sugar,	½ t. flavoring,
1 T. cornstarch,	1 egg or 2 yolks.

Mix sugar, corn starch and salt; add egg slightly beaten. Add scalded milk, stirring constantly. Cook in double-boiler until it thickens slightly. Cool and flavor.

CARAMEL CUSTARD

4 c. scalded milk,	½ t. salt.
5 eggs,	1 t. vanilla,
¼ c. water,	½ c. sugar.

Melt sugar in granite saucepan until it changes to a syrup of light brown color. Add water and when syrup is dissolved, add milk, beaten eggs, salt and flavoring. Pour into buttered moulds and bake slowly.

CUP CUSTARD OR BAKED CUSTARD

1 pt. milk,	4 T. sugar,
2 eggs,	spk. salt.

Beat eggs slightly, and pour the milk into the beaten egg, add salt and sugar and stir until the sugar dissolves. If desired a little nutmeg or flavoring may be added. Pour into buttered cups or a pudding dish, stand the cups in a pan of boiling water, put the pan in the oven and bake until the custards are firm in the center,—20-30 m. Try with a knife. If the knife comes out clean the custards are done.

ORANGE CUSTARD.

Arrange slices of sweet oranges in glass dish, pour over them soft custard.

Chill and serve. Bananas and oranges alternately may be used.

FLOATING ISLAND.

1 pt. milk,
4 eggs,
4 T. sugar,
¼ t. salt,
¼ t. spice, or ½ t. flavoring,
1 T. cornstarch.

Scald the milk. Separate the eggs. Beat the whites until very stiff, add 2 t. sugar to them, beat slightly and scrape mixture on top of the hot milk. Cook 5 m. or until firm. Mix salt, sugar and cornstarch. Add to yolks and beat slightly. Remove white of eggs and pour the hot milk on the beaten yolks slowly. Put this mixture into double boiler and stir until it thickens. When nearly cool, stir in flavoring and put the whites on the top and serve cold as a pudding. A pretty way to serve it is to lay specks of jelly on the whites.

GOLDEN ROD TOAST

Cook 3 eggs 20 m. Separate the yolk from the white and chop the whites fine. Toast 4 slices of bread; make 1 c. of thin white sauce with 1 c. of cream or milk, two T. butter, 1½ T. of flour, salt and pepper to taste. Stir the whites into the sauce, and when the sauce is hot pour it over the toast. Rub the yolks through a fine strainer over the whole.

OMELET

3 eggs,
½ t. salt,
spk. pepper,
3 T. hot water.

Beat the yolks of the eggs until thick; add salt, pepper and water. Fold in the whites of the eggs beaten stiff. Cook in a hot buttered omelet pan until brown underneath. Finish cooking on the top grate of the oven. Chopped parsley, cheese, fruit, jelly or meat may be placed in the center. Fold and turn upon heated platter.

Accurate Measurement

Accurate measurement is essential to insure good cooking. All measurements should be made LEVEL.

Half a spoonful is obtained by dividing through the middle lengthwise.

Abbreviations.	Measurements.	Weights.
ssp.—saltspoon.		2 c. butter (packed)—1 pound.
t.—teaspoon.	60 drops.—1 t.	4 c. flour (pastry)—1 pound.
T.—tablespoon.	8 ssp.—1 t.	2 c. sugar—1 pound.
c.—cup.	3 t.—1 T.	2 c. chopped meat—1 pound.
qt.—quart.	16 T.—1 c.	9 eggs—1 pound.
pt.—pint.	2 c.—1 pt.	2 T. butter—1 ounce.
spk.—speck.	2 pts.—1 qt.	4 T. flour—1 ounce.
lb.—pound.		8 qts.—1 pk.
m.—minute		3 c. meal—1 lb.

Pudding

CORN STARCH PUDDING

1 qt. of milk,
½ c. cornstarch,
¼ c. sugar,
½ t. salt,
Whites of 3 eggs,
1 t. vanilla.

Scald the milk; mix the cornstarch with sugar and stir into the hot milk; and cook 15 m., then, before folding in the whites of the eggs, beaten stiff, add the vanilla. Turn into a mould which has been rinsed in cold water and set aside to become chilled and firm. Serve with current jelly, cream and sugar, or with a soft custard.

For Chocolate Cornstarch Pudding, use ½ c. sugar and 2 oz. of chocolate.

TAPIOCA CREAM.

⅓ c. pearl tapioca,
1 pt. milk,
yolks of 2 eggs,
spk. salt,
whites of 2 eggs,
½ t. vanilla,
⅓ c. sugar.

Pick over the tapioca, put it in the top of a double boiler and cover with boiling water. Add the milk as soon as the water is absorbed, and cook until the tapioca is soft and clear. Beat the yolks of the eggs, add the salt and sugar and the hot milk, and cook until it thickens like soft custard. Remove from the fire, fold in the whites of the eggs beaten stiff. Flavor when cold. The whites may be mixed with 2 T. powdered sugar, put on top of pudding and brown in oven a few minutes.

APPLE TAPIOCA.

¾ c. pearl or minute tapioca,
2½ c. boiling water,
Cold water,
½ t. salt,
7 sour apples,
½ c. sugar.

Soak tapioca 1 hr. in cold water to cover; drain, add boiling water and salt; cook in double boiler until transparent. Core and pare apples, arrange in buttered pudding dish, fill cavities with sugar, pour over tapioca, and bake in moderate oven until apples are soft. Serve with sugar and cream.

Minute tapioca requires no soaking.

RICE PUDDING.

½ c. of well washed rice, 1 ssp. salt,
½ c. sugar, 1 qt. milk.

Soak ½ hr. Bake 2 hrs., slowly at first, till the rice has softened and thickened the milk; then let it brown slightly. This is creamy and delicious, though called "Poor Man's Pudding." Serve with milk and sugar or with strawberry jam.

CUSTARD SAUCE

1½ c. scalded milk, ¼ c. sugar,
⅛ t. salt, ½ t. vanilla,
Yolks of 3 eggs.

Beat eggs slightly, add sugar and salt; stir constantly while adding gradually the hot milk. Cook in double boiler until mixture thickens; chill and flavor.

RICE WITH APPLES OR PINEAPPLE

2 c. rice, (steamed), ½ c. sugar,
3 eggs, 2 apples, (steamed),
½ c milk.

Pare and core the apples, cut in eighths and cook until soft. Steam the rice, add well beaten yolks of eggs, sugar and cooked apples. Fold in the stiffly beaten whites and bake 30 m. in well-buttered baking dish. Serve with cream.

Eggs

COMPOSITION

Proteid, 14.9%,	M. M., 1%,
Fat, 10.6%,	Water, 73.5%.

Wash the eggs as soon as brought from the store.

They should be kept in a cool place. The white of an egg contains albumen and water; the yolk contains albumen, fat and sulphur.

Eggs cooked below the boiling point are more digestible than if boiled.

Eggs are beaten slightly when used for thickening.

SOFT COOKED EGGS

Put the eggs into a saucepan, cover with boiling water and let stand where the water will keep just below boiling point for 5 minutes.

HARD COOKED EGGS

Cook them in water just bubbling 30 min. This method renders the yolk mealy.

POACHED OR DROPPED EGGS

Fill a pan with boiling, salted water. Break each egg into a wet saucer and slip it into the water; set the pan back where the water will not boil. Dip the water over the eggs with a spoon. When the white is firm and a film has formed over the yolk they are cooked. Take them up with a skimmer, drain and serve on toast. Season with salt.

SCRAMBLED EGGS

3 eggs, ½ t. salt, ⅓c. milk, spk. pepper.

Beat the eggs slightly, add the milk and seasoning. Cook in a hot, buttered frying pan, stirring constantly until thick. Serve hot.

JAPANESE EGGS

Three hard-boiled eggs, 3 sardines, ½ teaspoon of salt, 1 tablespoon of butter, a few grains of cayenne, 1½ cups of hot boiled rice, 1 cup of tomato sauce.

Cut the eggs lengthwise and remove the yolks. Mince the sardines after removing the bones. Mix egg yolks, sardines, butter, and seasonings. Form into balls and place a ball in each half of white of egg. Spread the rice on a platter and arrange the eggs on it. Pour the tomato sauce around the eggs.

DIFFERENT CLASSES OF "ROTS."

"Rots: Eggs which are absolutely unfit for food. The different classes of rots may be defined as follows:

"[a] Black rot: This is the easiest class of rots to recognize and, consequently the best known. When the egg is held before the candle the contents have a blackish appearance, and in most cases the air cell is very prominent. The formation of hydrogen sulphid gas in the egg causes the contents to blacken and gives rise to the characteristic rotten egg smell, and sometimes causes the egg to explode.

"[b] White rot: These eggs have a characteristic sour smell. The contents become watery, the yolk and white mixed, and the whole egg offensive to both the sight and the smell. It is also known as the 'mixed rot.'

"[c] Spot rot: In this the foreign growth has not contaminated the entire egg, but has remained near the point of entrance. Such eggs are readily picked out with the candle, and when broken show lumpy particles adhering to the inside of the shell. These lumps are of various colors and appearances. It is probable that spot rots are caused as much by mold as bacteria, but for practical purposes the distinction is unnecessary.

"To all intents and purposes the spot rot, as explained above, is practically the same as the brown and black spots described under the general head of 'spots.' The spot rot is also placed under the general head of rots simply because some candlers will call it a spot, while others designate it as a spot rot. Pink and blood rots are names which are also applied to certain classes of rotten eggs, the pink rot deriving its name from the peculiar pinkish color of the contents when held before the candle. The same is true of the blood rot, which is bloody or red in appearance."

If those producing eggs for market purposes will carefully study the foregoing and then grade their eggs before sending them to the market, better prices will be obtained and a reputation will be made which is bound to result beneficially to the producer.

Cheese

General Rules

Cheese should not be tightly covered.

When it becomes dry and hard, grate and keep covered until ready to use. It may be sprinkled into soups or added to starchy foods.

Soda, in cheese dishes which are cooked, makes the casein more digestible. A soft, crumbly cheese is best for cooking.

Cheese is sufficiently cooked when melted, if cooked longer it becomes tough and leathery.

COMPOSITION OF CHEESE

Proteid, 31.23%,	Water, 30.17%,
Fat, 34.39%	Mineral Matter, 4.21%.

CHEESE FONDUE.

½ lb. grated cheese,	¼ t. salt,
1 T. butter,	¼ t. mustard,
1 t. corn starch or 1 egg,	Few grains cayenne pepper,

½ c. cream or milk.

Melt butter, remove from fire, add corn starch, stir until well mixed, then add cream gradually and cook 2 m. Add cheese and stir until cheese is melted. Season and serve on crackers.

Either a double boiler or a chafing dish may be used.

MACARONI AND CHEESE

½ lb. macaroni,	1 pt. white sauce,

1 c. cheese.

Boil the macaroni and prepare white sauce. Have ready grated cheese. Butter a pudding dish, put in a layer of macaroni, one of sauce and one of cheese, another layer each of macaroni and sauce. Mix the remaining cheese with bread crumbs and spread over top.

Bake 15 m. in a hot oven.

Macaroni should be boiled from 20 to 30 m.

WELSH RAREBIT

Select richest and best American cheese, the milder the better, as melting brings out strength. To make 5 rarebits, take 1 pound cheese, grate and put in tin or porcelain-lined sauce-pan; add ale, (old is best) enough to thin the cheese sufficiently, say about a wine glass to each rarebit. Place over fire, stir until melted. Have slice of toast ready for each rarebit (crusts trimmed); put a slice on each plate, and pour cheese enough over each piece to cover it. Serve while hot.

Leavening Agents

Carbon dioxide found by
- 1. Action of yeast
- 2. Combinations of an alkali, acid and moisture:
  - 1. Baking Powder
  - 2. Soda and Cream of Tartar.
  - 3. Soda and Sour Milk.
  - 4. Soda and Molasses.
  - 5. Carbonate of Ammonia.

Baking Powder
- ½ cream of tartar,
- ¼ soda,
- ¼ starch.

Batter is a mixture of flour with sufficient liquid to make it thin enough to be beaten.

Pour-Batter, 1 meas. of liquid to 1 meas. of flour.

Drop-Batter, 1 meas. of liquid to 2 meas. of flour.

General directions for Batters and Doughs:

Sift flour before measuring. Put flour by spoonfuls into the cup; do not press or shake down. Mix and sift dry ingredients. Measure dry, then liquid ingredients, shortening may be rubbed or chopped in while cold, or creamed; or it may be melted and then added to dry ingredients, or added after the liquid. Use 2 t. baking powder to 1 c. flour. If eggs are used, less baking powder will be required.

Baking powder mixtures should be handled as little as possible.

Baking powder mixtures require a hot oven.

Proportion of soda to sour milk: ½ t. to 1 c. thick, sour milk.

Proportion of soda to molasses: 1 t. to 1 c. molasses.

Shortening added to make mixture tender.
- 1. Butter.
- 2. Lard.
- 3. Drippings .
- 4. Suet.

Gas introduced to make mixtures porous or light.
- 1. Steam.
- 2. Air
- 3. Carbon dioxide.

POPOVERS.

1 c. flour,
¼ t. salt,
1 c. milk,
2 small or 1 large egg.

Mix salt and flour and add milk until a smooth paste is formed; add the remainder of the milk with the beaten egg and beat thoroughly. Bake in hot buttered gem pans in a quick oven 30 to 40 m., or until the puffs are brown and well popped over.

DIRECTIONS FOR BAKING CAKE.

Divide time into quarters. First quarter, cake should begin to rise; second quarter, cake should continue rising; third quarter, cake should finish rising and begin to brown; fourth quarter, cake should finish browning and shrink from sides of pan.

TESTS FOR OVEN.

Place a piece of unglazed paper in oven. For hot oven, paper must brown in 3 m.; for moderate oven, paper must brown in 5 m.; for slow oven, paper must brown in 10 m.

HEATING OF THE GAS OVEN.

For loaf cakes and ginger breads heat oven with gas turned on full for 3 m. Put in cakes, turn down gas half way; at the end of 10 m. increase or decrease as desired.

For layer cakes heat oven 5 min. with gas turned on full. Put cake in and leave gas as it is for about 8 min., then decrease.

Batters

PLAIN GRIDDLE CAKES

½ t. soda,
1 c. flour,
¼ t. salt,
1 c. sour milk, (scant)
1 T. shortening,
1 egg, yellow and white beaten separately.

Sift the dry ingredients. Beat the egg yolk, add the milk and stir it in gradually to make a smooth batter. Add shortening melted. If not thin enough use more milk. Fold in beaten egg, white last.

Pour the cakes on the griddle from the end of a large spoon. When the cakes are full of bubbles, turn with a broad knife, and brown on the other side.

BREAD GRIDDLE CAKES

1½ c. fine bread crumbs,
1½ c. hot milk,
2 T. butter,
2 eggs,
½ c. flour,
½ t. salt,
3½ t. baking powder.

Mix in the order given. 1 c. any cooked cereal may be used instead of bread crumbs.

POTATO GRIDDLE CAKES

12 good sized potatoes.
6 T. flour,
1 t. baking powder,
½ t. salt,
2 eggs,
2 c. scalded milk.

Pare and chop the potatoes into a little cold water. Strain them and pour on the scalded milk. Stir in the eggs, salt and flour, into which baking powder has been mixed. Add a teaspoonful of onion juice, or a little chopped onion, and bake like ordinary cakes.

WAFFLES

½ t. salt,
1 T. melted butter,
1 pt. flour,
3 t. baking powder,
2 eggs, yolks and whites beaten separately,
1 c. milk.

Mix in the order given and bake at once. If the batter is too stiff more milk may be used.

SUGAR SYRUP

2 c. sugar,
1 c. water, (scant).

Boil till clear, do not stir after the sugar and water are mixed. Cool and serve with griddle cakes.

Bread

Yeast is a plant, the small invisible germs of which are floating in the air. Yeast grows in sprouting grain. Yeast belongs to the same family as the mushroom and consists of little cells. Hot water kills the thousands of plants found in compressed yeast. Cold water chills the yeast. Luke warm liquids should be used.

When the yeast plant grows it causes fermentation, which changes some of the starch into sugar and then some of the sugar into alcohol and carbon-dioxide and carbonated gas. This carbon-dioxide raises the dough. If it rises too long it will make the bread sour.

Dough is made light in five ways:

1. By the use of yeast.
2. By the use of baking powder.
3. (a) By the use of soda and molasses.
   (b) By the use of soda and sour milk.
4. By beating air into a mixture and by steam.
5. By use of carbonate of ammonia.

BREAD

2 c. luke warm liquid,	½ cake compressed yeast,
2 t. salt,	½ c. luke warm water,
2. t. sugar,	6 to 6½ c. flour.

(With water use 1 T. lard or butter.)

Put the liquid, salt, sugar and shortening into a bowl; add the yeast, then the flour gradually. When stiff enough to handle, turn the dough out on a floured board and knead until soft and elastic. Put it back into the bowl, moisten, cover and let it rise in a warm place until double its bulk, cut down, then divide into loaves or shape into biscuits. Allow these to rise in the pan in which they are to be baked. Cover the bread and again allow it to double in bulk, then bake.

If set in day time, use 1 cake yeast. This recipe makes two loaves. If set at night, use ½ cake yeast.

BREAD BAKING

Loaves of bread should be baked 1 hr. or more in a hot oven. The heat of the oven should be increased slightly during the first 20 m. and should be kept even for 20 m. and should decrease during last 20 m.

When baked the loaves should be cooled, uncovered on a wire rack.

Bread should be kept in a clean tin box and not exposed to moisture.

BREAD AND OTHER COOKED FOODS.

While cooling, newly baked bread should be lightly covered with a clean cloth or paper to prevent mold germs and dust from falling upon it, but should not be tightly wrapped in a thick cloth as is the practice in some households, for unless it is aired when taken from the oven, it is likely to become "soggy" and damp and thus offers an excellent medium for cultivation of molds. When perfectly cold the bread should be placed in a close receptacle that has been thoroughly scalded and aired. If bread is to be kept for more than two or three days in damp, hot weather, the jar or box should be taken out and sunned for a short time now and then, and again scalded and dried. On no account should portions of a former baking be stored with a new batch.

Cake and cookies should be cooled after baking and kept in tin boxes or in earthenware jars, which, like bread boxes, should be often scalded and aired. Even if these foods are to be eaten at the next meal it is well to keep them in some such receptacle, as it insures protection from dust. A cake, pudding, or pie put out of a window uncovered to cool or in any other place where it is exposed to dust, and in summer also to flies, is something that no careful housewife would place on her table if she stopped to think how easily the food may be contaminated.—*Extract, Farmers' Bulletin No. 389.*

General Rules for Steaming

See that the water is boiling in the kettle or steamer when the food is ready for cooking. Keep the water boiling constantly. Refill when necessary with boiling water.

Do not jar the kettle.

A mold or tightly covered tin can may be used; it should be thoroughly greased and if it has no cover, a strong piece of oiled paper may be tied over the top; this should also be greased. It should be put into a steamer over boiling water, or on a rack in a kettle of boiling water.

BOSTON BROWN BREAD, No. 1

2 c. rye meal,
1 c. corn meal,
½ T. soda,
½ t. salt,
½ c. molasses,
2 c. sour milk.

Put into a tightly covered mould which has been greased. Cook over steam 3 hrs., then dry in the oven a few minutes.

BOSTON BROWN BREAD No. 2

1 c. rye meal,
1 c. granulated corn meal,
1 c. graham flour,
1 t. soda,
1 t. salt,
¾ c. molasses,
1¾ c. sweet milk or same of warm water.

Mix the dry ingredients and sift all together, add milk and molasses, and place in a covered, greased mould and steam 2½ hrs. Or steam in small cups 1 hr.

fill the cups or mould ⅔ full.

BAKED BEANS

1 qt. beans,
½ lb. fat salt pork,
½ t. mustard
1 T. salt.
2 T. molasses,
1 c. boiling water.

Pick beans over, cover with cold water mixed with a little soda and let soak over night. In the morning cover with fresh water, heat slowly and let cook just below the boiling point until the skins burst. This is best determined by taking a few on the tip of a spoon and blowing over them. If done the skins will burst. When done drain beans and put in pot. Scald pork, cut through rind in ½ in. strips, bury in beans leaving rind exposed. Mix mustard, salt, molasses and water, and pour over beans and add enough more water to cover them. Cover pot and bake slowly six or eight hrs. Uncover pot the last hr. so that pork will be brown and crisp.

Pastry

General Rules.

All of the materials must be as cool as possible.

The shortening should not be cut very fine, if a flaky crust is desired.

The dough should be mixed with a knife and not touched with the hands. It should be rolled on one side, using but little flour, The dough is rolled thin and baked until brown.

Meat and oyster pies should be made without an undercrust. The crust should be cut in several places to allow the steam to escape.

If an under crust is used, this crust may be baked on the outside of a tin plate, then filled. In this case the crust must be picked all over with a fork, so that it may keep its shape.

If two crusts are used the lower one should be moistened around the edge with cold water, then a ½ in. strip of paste may be placed around the edge of the undercrust. This strip should also be moistened, and the uppercrust placed over the pie and pressed lightly around the edge.

The paste may be made the day before using, then covered and placed on ice. It rolls more easily if placed on ice after mixing.

PLAIN PASTRY

1 ¼ c. pastry flour, ¼ t. salt,
⅓ or ½ c. shortening (lard and butter.)
Ice water.

Mix in the order given.

APPLE PIE

Wipe and cut tart apples into eighths, remove the cores and skins. Vary the amount of sugar according to the acidity of the apples, using 2 T. or more for an apple. If not juicy, add from ½ T. to 1 T. water according to the size of the apple.

The apples may be flavored with lemon juice, cinnamon or nutmeg, and should be dotted with bits of butter.

Bake until the apples are soft and the crust is brown.

Apple sauce may be used on a baked crust.

LEMON PIE

3 T. cornstarch, juice and rind 1 lemon
1 c. sugar, 4 t. butter,
1 c. boiling water, 4 t. powdered sugar.
2 eggs.

Beat yolks of eggs until light. Mix the sugar and cornstarch together. Add the boiling water slowly. Cook 20 m., stirring frequently, add the mixture to the egg, add butter and lemon, and cook until the egg thickens. When mixture is cool, place it in a baked crust. Cover with a meringue, and bake until a delicate brown.

SHORT PASTE

1 hp. c. flour, 4 T. lard,
¼ t. salt, 4 T. butter.

Have all the material ice cold. Chop the shortening in the flour till the size of peas and beans. Toss lightly with a knife, adding enough ice water to about half wet the flour. Turn out on a smooth cold board. Gather with the knife into a square pile. Then pound lightly with rolling pin till well flattened. Roll in an oblong piece ½ in. thick; fold in thirds and roll again; repeat, and after the third rolling it will usually be sufficiently compact to roll thin enough to line a plate. This paste improves by standing half an hour or more on the ice. Suffcient for 1 pie.

Souffles

APPLE SOUFFLE.

Pass through a sieve four tart apples which have been pared, cored and cooked in just enough water to keep from burning. Sift together four level tablespoons cornstarch and one level tablespoon flour dissolved in four tablespoons cold water. Melt one tablespoon butter with one-fourth teaspoon salt and turn in one cup boiling water and add flour and cornstarch. Sweeten to taste one cup hot pulp and flavor with one teaspoon lemon juice. Remove from fire and stir thoroughly. Add beaten yolks of three eggs and white beaten to stiff froth. Pour into shallow baking dish and bake in moderately hot oven until puffed and brown.

SALT CODFISH SOUFFLE.

One cupful of shredded codfish, two tablespoonfuls of flour, two tablespoonfuls of butter, a fourth of a teaspoon of pepper, three eggs, one teaspoonful of minced parsley, two cupfuls of milk, one cupful of soft bread crumbs, and a fourth of a teaspoonful of onion juice.

Make as white sauce of the butter, flour and milk. Freshen the codfish, rinse well, then add to sauce with the seasoning and crumbs; separate the eggs and beat the yolks light, stir them into the mixture, fold in the whites beaten stiff and pour all into a buttered baking dish. Surround with hot water and bake 30 m. in a rather slow oven. Serve the souffle at once in the dish in which it is baked.

SMOKED SALMON CHARTREUSE.

One and a fourth cupfuls of rice, two teaspoonfuls of curry powder, two tablespoonfuls of butter, two and a half cupfuls of flaked smoked salmon, one teaspoonful of lemon juice, an eighth of a teaspoonful of pepper, half teaspoonful of onion juice, three-quarter cupful of milk, two tablespoonfuls of flour and two tablespoonfuls of butter.

Soak the salmon to remove the excessive salt. Boil the rice as usual and stir lightly into it the curry powder creamed with two tablespoonfuls of the butter. Make a thick sauce of the butter, flour and milk and add the fish, lemon juice, pepper and onion juice. Line a well buttered bread tin with the rice. Pack in the fish mixture, put in a layer of the rice over the top, and steam or bake in a pan of water in the oven for thirty minutes. Serve with creamed peas.

Cookies

ORANGE COOKIES.

4 T. butter,
1 c. sugar,
2 c. flour,
Grated rind ½ orange
4 egg yolks,
2 T. Orange juice,
2 T. baking powder,
More flour if needed.

Cream butter, add sugar and orange rind gradually, add egg yolks and sift flour and baking powder three times and add alternately with water and orange juice. Mix stiff and roll and cut. Bake 8 to 10 min. in hot oven.

FRUIT COOKIES.

1¼ c. sugar,
2 eggs,
½ c. shortening,
1 t. cinnamon,
1 t. cloves,
1 c. seedless raisins,
2 T. milk (sweet)
2 t. baking powder,
Nutmeg to taste,
Flour to make a stiff dough.

Mix as in sugar cookies.

PEANUT COOKIES.

2 T. butter,
¼ c. sugar,
1 egg,
1 t. baking powder,
¼ t. salt,
½ c. flour,
2 T. milk,
½ c. finely chopped peanuts,
½ t. lemon juice.

Cream the butter, add sugar and egg well beaten. Mix and sift dry ingredients; add to first mixture, then add milk, peanuts and lemon juice. Drop from a teaspoon on an unbuttered sheet 1 inch apart. Bake 12 to 15 min. in slow oven. This recipe makes 24 cookies.

Rules for Cake Making

Mrs. Woodrow Wilson.

Use the best materials. Never consider "cooking-butter" nor second rate eggs; always use table butter and the very best of extra fresh eggs. For cold storage products will make poor cake no matter how skilful is the manipulating.

Use what is known as "soft A" sugar. This is better for cake than the regular granulated sugar.

When measuring stint your cups of sugar, never heap them; too much sugar coarsens the grain of cake. Measure baking powder in slightly rounded spoonfuls never heaped. Use sour milk and soda in place of baking powder when you can.

Never, never guess at measurements. Be exact in proportions, and follow directions implicitly.

Use rich milk, half cream if you can. This produces a rich cake.

Keep your batter thin. Always bear this in mind above all things; a thick batter can never bake into a successful cake. So stint your flour always. One must use one's judgment here for flours differ in heaviness and eggs in size, so one must bear in mind to keep the batter thin and and stint the flour when necessary.

Have everything ready at hand before you begin to mix the cake, for once it is started the work should go ahead swiftly and the cake should go into the oven quickly unless it is one of the recipes that call for the "ripening" process.

Use a wooden paddle for beating the cake.

Sift your flour twice over. There is more in this little act than one would ever dream.

Paper your pans and butter your paper well, never use lard or drippings. Cake demands the best of everything straight through.

Have your oven just right. Learn what a "cake oven" is and then see that you have it."

—*Extract, National Food Magazine.*

Cakes Without Butter

SPONGE CAKE

Yolks 6 eggs,
1 c. sugar,
1 T. lemon juice,
Grated rind ½ lemon,
Whites 6 eggs,
1 c. flour.

Beat yolks until thick and lemon colored, add sugar gradually, and continue beating. Add lemon juice, rind and whites of eggs beaten until stiff and dry. When whites are partially mixed with yolks, carefully cut and fold in flour, mixed and sifted with salt. Bake in an unbuttered pan, in a slow oven for 1 hr.

SPONGE JELLY ROLL

5 eggs,
The grated rind of 1 lemon
2 T. of lemon juice,
1 c. of sugar,
1 c. of flour,
Fruit jelly.

Beat the yolks of the eggs until very thick; add the sugar gradually, then the lemon rind and juice; fold in half the whites of the eggs beaten dry, then half the flour, the half of the whites of the eggs and the other half of the flour. Bake in a large dripping pan about 15 m.; turn from the pan onto a cloth, trim the edges of the cake, spread the bottom of the cake (the top as it lies on the cloth) with the jelly; then roll closely, wrap in the cloth and set aside to cool.

QUICK SPONGE CREAM CAKE.

Put 2 eggs and ⅔ of a c. of sugar into a mixing bowl and beat with the egg beater till very light. Add 5 T. of rapidily boiling water and beat again. Mix 1 c. of sifted flour with 2 level t. of baking powder and ¼ t. of salt. Stir this into the eggs quickly, add 1 t. of lemon or vanilla and when well mixed, turn at once into 2 well greased jelly cake pans and bake about 12 m. in a moderate oven. Reduce the heat as soon as well risen, and at the last turn out the burner, and remove the cake when firm. Whip 1 c. of thick cream till stiff, adding powdered sugar till sweet to taste, and flavor with vanilla. Put part of it on the bottom of one cake lay the other cake on with the top up and put the remainder of the cream on by forcing it through a pastry tube in a bag in any fanciful design.

ANGEL CAKE.

Whites of 8 eggs,
1 t. cream of tartar,
1 c. sugar,
¾ c. flour,
¼ t. salt,
¾ t. vanilla.

Beat whites of eggs until frothy; add cream of tartar and continue beating until eggs are stiff; then add sugar gradually. Fold in flour mixed with salt and sifted four times; add vanilla. Bake 45 m. to 1 hr. in an unbuttered angel cake pan. After cake has risen and begins to brown cover with a buttered paper.

Cakes With Butter

The oven must be ready for baking, the pans thoroughly greased with the same kind of fat used in the mixture.

Sift flour before measuring; pastry flour should be used. The flour and baking powder must be mixed and sifted several times, and if spices are used they should be sifted with the flour. Powdered or finely granulated sugar may be used.

Cream the butter, add the sugar gradually. The yolks and whites of the eggs should be beaten separately, and the yolks added to the butter and sugar. The bowl in which they were beaten should be rinsed with the milk. The milk and flour are added alternately, then the flavoring and the whites of the eggs. When fruit is used save a little flour to cover it and add just before the whites of the eggs.

Bake the cake from 20-40 m., or until it shrinks from the sides of the pan. When taken from oven, allow it to remain in the pan about 3 m.

Raisins quartered and seeded and sprinkled with flour may be added to the cake just before baking.

QUICK CAKE

½ c. soft butter, 1½ c. brown sugar, 2 eggs, ½ c. milk, 1¾ c. flour, 3 t. baking powder, ½ t. cinnamon, ½ t. grated nutmeg, 1½ lb. dates, stoned and finely chopped.

Put all ingredients in a bowl together and beat thoroughly for 3 or 4 m. Bake in lined loaf pan 35 to 40 m. Do not attempt to add the ingredients separately if you wish a satisfactory cake. Occasionally the housekeeper has a few raisins, or nuts, or figs, "left over" from other preparations. These she may combine and use instead of the dates, but do not change the proportion. That should be half a pound. If figs should be used put them through the chopper. This mixture may be baked in gem pans and served hot, as a plum or fruit pudding, with hard or other sauce, to taste.

FIG LAYER CAKE

Cream 1 c. of sugar with ½ c. of butter until very light. Separate 3 eggs and add the yolks, 1 at a time, beating in each one thoroughly. Then add ½ c. of milk, 1 t. of vanilla, 2 c. of pastry flour sifted with 2 t. of baking powder. Beat the batter until light and smooth, fold in whites beaten light. Bake in layer cake tins in a moderately quick oven 20 to 30 min. Use a fig paste filling between the layers.

FIG FILLING

1 lb. of figs put through the chopper. Put in a granite sauce pan with 1 c. of boiling water, ½ c. of sugar and juice of ½ a lemon. Place on asbestos mat over the simmering burner and cook slowly until it becomes a smooth paste. Set aside to cool before using.

GOLD CAKE

½ c. butter, 1 c. sugar, 1 whole egg, 4 egg yolks, ½ t. lemon, ½ t. vanilla, ½ t. almond, ½ c. milk, 1¾ c. flour, 2 t. baking powder.

Cream the butter and add sugar gradually. Beat whole eggs and yolks until light. Add extracts 1 at a time as measured and beat in well. Alternate milk and flour, sifted with baking powder, and beat quickly. Bake in oblong loaf pan in moderate oven 25 to 35 minutes.

RICH COFFEE CAKE

1 c. butter, 2 c. sugar, 4 eggs, 2 T. molasses, 1 c. boiled coffee, 3¾ c. flour, 5 level t. baking powder, 1 t. cinnamon, ½ t. cloves, ½ t. mace, ½ t. allspice, ¾ c. raisins, seeded and cut in pieces, ¾ c. currants, ¼ c. citron thinly sliced, 2 T. brandy. Bake gently in brick loaf pans.

Fish

Fish may be scaled much easier if dipped into boiling water for a minute.

Salt fish are quickest and best freshened by soaking in sour milk.

Fish must be perfectly fresh and should be kept in a cool place until cooked. Do not put in refrigerator on account of odor. The flesh should be firm and the eyes bright. The inside and the outside of the fish should be thoroughly washed in cold water. The head and tail may be removed. Dry fish need butter rubbed over them before broiling.

When fish is cooked the flesh separates from the bone. It should be served hot, with sauce or garnished with lemon, hard-cooked eggs or parsley.

Cold cooked fish may be used in various ways, as creamed, scalloped, etc.

BROILED FISH

Sear the flesh side first, then turn over a minute. The length of time for cooking depends upon the thickness of the fish. Season with butter, salt and pepper, and garnish.

BAKED FISH

Sprinkle the fish with salt and fill with stuffing, stew and skewer the edges together. Cut gashes on each side across the fish and put strips of salt pork into them. Grease the baking sheet and place the fish on it, dredge with flour, salt and pepper, put the sheet into a baking pan with pieces of pork fat under the fish. Baste every 10 m. Serve with a sauce. Bake a 1 lb. fish ½ hr.

STUFFING FOR BAKED FISH

1 c. fine bread or cracker crumbs,
1 t. chopped onion or juice,
¼ t. salt,
½ t. chopped parsley,
2 t. chopped pickles,
¼ t. pepper,
1 t. lemon juice,
¼ c. melted butter.
Milk or water to moisten.

Mix ingredients thoroughly. Use enough liquid to make the stuffing stick together.

FISH COOKED IN WATER

Steam fish over gently boiling water, or place it in a piece of muslin, sew or tie the edges together, and put the fish into boiling water; boil 5 m., then add 1 T. salt and cook at a lower temperature until done. Serve with a sauce.

DRAWN BUTTER SAUCE

2 c. boiling water, milk or fish stock,	4 T. flour,
8 T. butter,	½ t. salt,
	⅛ t. pepper.

Melt 4 T. butter into a sauce pan, add the flour and when bubbling, add the boiling liquid, the remainder of the butter in small pieces, and the salt and pepper. Boil 5 m. and serve.

1 T. of lemon juice may be added if desired, or 2 T. of chopped pickle.

OYSTER STEW.

Wash 1 pt. oysters by adding ¼ c. cold water. Pick over the oysters. Scald 1 pt. milk, add 1 T. butter, salt and pepper. Add the oysters and cook until plump and the edges curl. They should not be allowed to boil.

Cooking in Deep Fat

General Rules.

The fat used for cooking may be olive oil, cottonseed oil, cottolene, beef drippings, lard, or a mixture of several fats.

Egg on inside or outside of mixture prevents absorbtion of fat.

Place the articles to be cooked in a bath of the fat, deep enough to float them. The kettle should be of iron; a frying basket should be used.

Foods already cooked or needing little cooking, require a higher temperature than batters. The temperature of the fat for oysters, croquettes, fish balls, etc., may be tested by browning a cube of bread while counting forty. Counting sixty while bread browns gives the right temperature for all batters.

All the articles cooked must be drained on unglazed brown paper.

When one quantity of food has been taken from the fat, the fat must be reheated and tested before a second quantity is put in.

In the absence of a frying basket, a wire spoon may be used to remove the food from the fat.

Fat which has been used for frying, should be cooled and clarified by cooking a few slices of raw potato in it for 10 m.; strain through muslin and when cold cover. Fat may be used several times for frying and then be made into soap.

CREAMED CODFISH

Cut the salt codfish in ¼-in. slices across the grain, and soak in lukewarm water, the time depending upon the saltiness and hardness of the fish. Drain and add 1 c. thin, white sauce. Add 1 beaten egg just before sending to the table. Garnish with hard-cooked eggs.

CODFISH BALLS.

2 ½ c. potatoes,
1 c. salt cod fish,
1 egg,
½ T. butter,
⅛ t. pepper.

Wash the fish in cold water and break into small pieces; wash and pare the potatoes and cut in pieces. Cook the fish and potatoes together in boiling water until the potatoes are soft; drain and shake over the fire until dry, mash with a wire potato masher, add the beaten egg, butter and pepper, add more salt if needed, and beat until light. Take up the mixture by spoonfuls, mould slightly, and slip them into the fat. Fry 1 m., or until brown.

If codfish balls break, add a little more egg.

FRENCH FRIED POTATOES

Wash and pare small potatoes, cut in eighths, lengthwise, and soak in cold water. Take from water, dry between towels, and fry in deep fat. Drain on brown paper and sprinkle with salt. Care must be taken that fat is not too hot, as potatoes must be cooked as well as browned.

Directions for Frying

The fat should be smoking hot. Try it with a small cube of bread. Count sixty; if the bread browns the fat is hot enough. Drain food on soft paper or through a wire strainer, after frying.

Strain the fat carefully after using.

As food cools the fat, put in only a few pieces at a time.

DOUGHNUTS

1 pt flour,
1 t. salt,
¼ t. cinnamon,
2 t. butter,
½ c. sugar,
4 t. baking powder,
2 eggs,
½ c. milk.

Cream butter and sugar. Add beaten egg, sift salt, cinnamon and baking powder with ½ the flour. Add to batter alternate with the milk. Add more flour to make dough stiff enough to roll.

In doughs for cookies and doughnuts always sift baking powder with one half of flour.

FISH COOKED IN FAT

Season with salt and pepper and cover with equal amounts of corn meal and flour, or crumbs and egg. Cook in deep fat or saute. Drain on paper.

FRIED RYE MUFFINS

¾ c. rye meal.
¾ c. white flour,
2 t. baking powder,
1 T. sugar,
¼ t. salt,
1 egg.
½ c. milk.

Mix in the order given and drop from a small tablespoon into hot fat. Cook until muffin will not stick when tried with a toothpick.

APPLE FRITTERS

1⅓ c. flour,
2 t. baking powder,
1 egg,
¼ t. salt,
⅔ c milk.

Mix and sift dry ingredients, add milk gradually and egg well beaten; pare, core and cut two medium sized sour apples into eighths, then cut eighths in slices and stir into batter. Drop by spoonfuls and fry in deep fat. Drain on brown paper and sprinkle with powdered sugar. Bananas, oranges, cherries, fresh peaches, cooked cauliflower or celery may be cut in pieces, dipped in batter and fried same as other fritters. Canned fruits may be used, after draining from their syrup.

Soups Without Meat

GENERAL RULES

Soups without meat are made from vegetables and fish. The pulp may be strained out or not as desired and combined with either milk or water.

These soups are thickened by using butter and flour; this prevents a separation of the thicker and thinner parts of the soup; the butter should be heated until it bubbles, the flour and seasoning added and enough of the hot liquid to make a smooth sauce thin enough to pour easily; this should be poured into the rest of the hot liquid and cooked in a double boiler until the soup is of the proper consistency.

Soda is used in soups made of dried peas and beans to soften the casein; soda is used in tomatoes to neutralize the acid.

These soups must be served as soon as cooked, and in hot dishes.

Crisp crackers, croutons or soup sticks, may be served with them.

Make Thick White Sauce for { Tomato Soup. Asparagus Soup. Spinach Soup. and all other watery Vegetables.

Make a Thin White Sauce for { Potato Soup. Pea Soup. Bean Soup, etc.

CREAM OF POTATO SOUP

2 potatoes,
1 t. salt,
1 T. butter
1 T. flour,
1 pt. milk,
1 spk. white pepper,
1 small slice onion,
1 t. parsley.

Cook the potatoes till very soft. Scald the milk and onion in a double boiler. Drain the Potatoes; add the milk, having removed the onion. Rub through a strainer and put back into double boiler over the fire. Melt the butter or dripping, add the flour, stirring all the time. Pour some of the hot soup over the thickening, then return to the boiler and cook 5 m. Add 1 t. finely chopped parsley and serve very hot. If the soup be too thick, add hot water or milk.

CREAM OF CORN SOUP.

1 can corn,
1 pt. water,
1 qt. hot milk,
2 t. salt,
4 T. butter,
1 slice onion,
4 T. flour,
¼ t. white pepper.

Heat the milk and onion, then remove the onion. Chop the corn and cook it with water 20 m. Melt the butter, add the flour, and when thoroughly mixed, add the milk gradually, then cook till slightly thickened. Add this mixture to the corn and season with salt and pepper. If you wish rub the corn through a sieve. Serve hot.

CREAM OF TOMATO SOUP

1 pt. tomato,
1 qt. hot milk,
2 t. salt.
¼ t. white pepper.
4 T. butter,
1 slice onion,
4 T. flour.

Heat the milk and onion, then remove onion. Melt the butter, add the flour, and when thoroughly mixed, add the milk gradually, then cook till slightly thickened. Add strained tomato, season and serve.

Asparagus, spinach, cauliflower and celery may be prepared the same way.

CRISP CRACKERS

Brown crackers in a hot oven. They may be buttered before browning if desired.

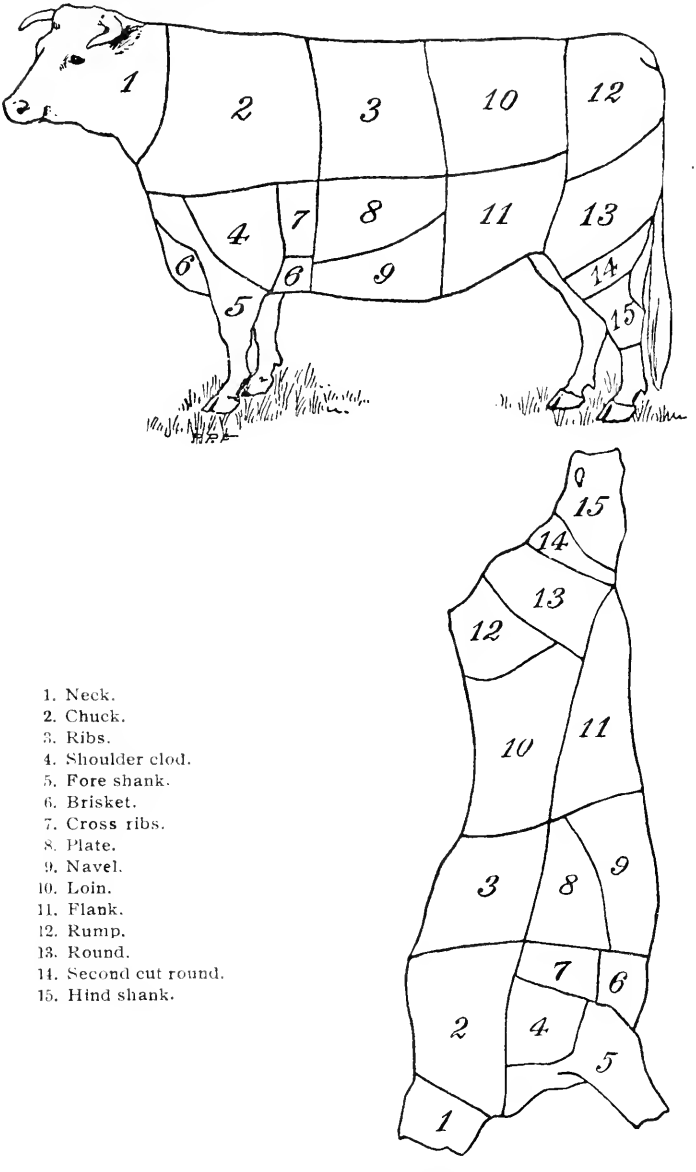
Cuts of Meat

The methods of cutting sides of beef, veal, mutton, and pork into parts, and the terms used for the different "cuts," as these parts are commonly called, vary in different localities. The analyses here reported apply to cuts as indicated by the following diagrams. These show the positions of the different cuts, both in the live animal and in the dressed carcass as found in the markets. The lines of division between the different cuts will vary slightly, according to the usage of the local market, even where the general method of cutting is as here indicated. The names of the same cuts likewise vary in different parts of the country.

CUTS OF BEEF.

The general method of cutting up a side of beef is illustrated in fig. 1, which shows the relative position of the cuts in the animal and in a dressed side. The neck piece is frequently cut so as to include more of the chuck than is represented by the diagrams. The shoulder clod is usually cut without bone, while the shoulder (not indicated in diagram) would include more or less of the shoulder blade and of the upper end of the fore shank. Shoulder steak is cut from the chuck. In many localities the plate is made to include all the parts of the forequarter designated on the diagrams as brisket, cross-ribs, plate and navel, and different portions of the plate, as thus cut, are spoken of as the "brisket end of plate" and "navel end of plate." This part of the animal is largely used for corning. The ribs are frequently divided into first, second, and third cuts, the latter lying nearest the chuck and being slightly less desirable than the former. The chuck is sometimes subdivided in a similar manner, the third cut of the chuck being nearest the neck. The names applied to different portions of the loin vary considerably in different localities. The part nearest the ribs is frequently called "small end of loin" or "short steak." The other end of the loin is called "hip sirloin" or "sirloin." Between the short and the sirloin is a portion quite generally called the "tenderloin," for the reason that the real tenderloin, the very tender strip of meat lying inside the loin, is found most fully developed in this cut. Porterhouse steak is a term most frequently applied to either the short steak or the tenderloin. It is not uncommon to find the flank cut so as to include more of the loin than is indicated in the figures, in which case the upper portion is called "flank steak." The larger part of the flank is, however, very frequently corned, as is also the case with the rump. In some markets the rump is cut so as to include a portion of the loin, which is then sold as "rump steak." The portion of the round on the

inside of the leg is regarded as more tender than that on the outside and is frequently preferred to the latter. As the leg lies upon the



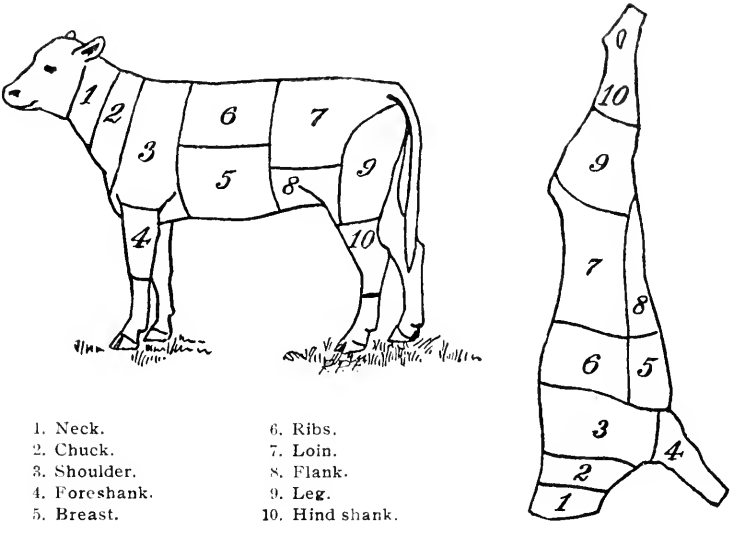
1. Neck.
2. Chuck.
3. Ribs.
4. Shoulder clod.
5. Fore shank.
6. Brisket.
7. Cross ribs.
8. Plate.
9. Navel.
10. Loin.
11. Flank.
12. Rump.
13. Round.
14. Second cut round.
15. Hind shank.

FIG. 1—Diagrams of cuts of beef.

butcher's table this inside of the round is usually on the upper, or top side, and is therefore called "top round." Occasionally the plate is called the "rattle."

CUTS OF VEAL.

The method of cutting up a side of veal differs considerably from that employed with beef. This is illustrated by fig. 2, which shows the relative position of the cuts in the animal and in a dressed side. The chuck is much smaller in proportion, and frequently no distinction is made between the chuck and the neck. The chuck is often cut so as to include a considerable of the portion here desig-



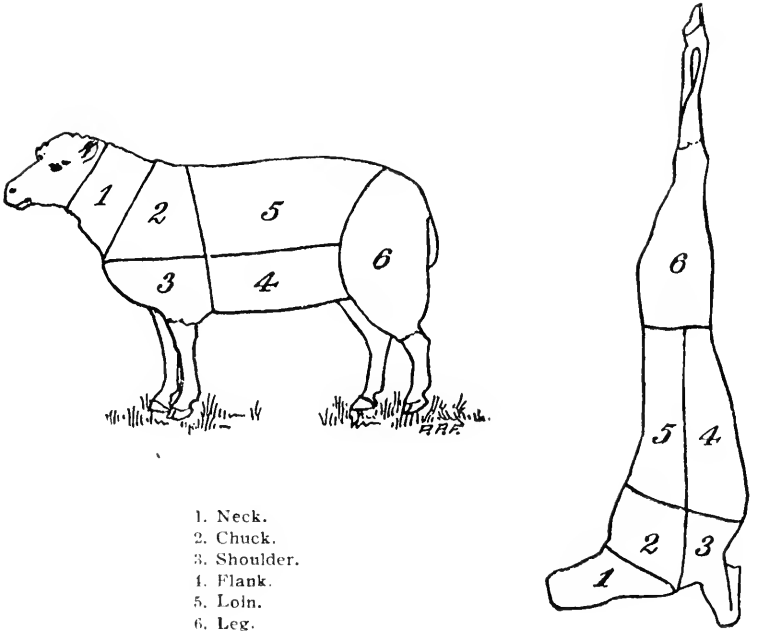
1. Neck.
2. Chuck.
3. Shoulder.
4. Foreshank.
5. Breast.
6. Ribs.
7. Loin.
8. Flank.
9. Leg.
10. Hind shank.

FIG. 2.—Diagrams of cuts of veal.

nated as shoulder, following more nearly the method adopted for subdividing beef. The shoulder of veal as here indicated includes, besides the portion corresponding to the shoulder in beef, the larger part of what is here classed as chuck in the adult animal. The under part of the forequarter, corresponding to the plate in the beef, is often designated as breast in the veal. The part of the veal corresponding to the rump of beef is here included with the loin, but is often cut to form part of the leg. In many localities the fore and hind shanks of veal are called the "knuckles."

CUTS OF LAMB AND MUTTON.

Fig. 3 shows the relative position of the cuts in a dressed side of mutton or lamb and in a live animal. The cuts in a side of lamb and mutton number but six, three in each quarter. The chuck includes the ribs as far as the end of the shoulder blades, beyond which comes the loin. The flank is made to include all the under side of the animal. Some butchers, however, make a larger number of cuts in the forequarter, including a portion of the cuts marked



1. Neck.
2. Chuck.
3. Shoulder.
4. Flank.
5. Loin.
6. Leg.

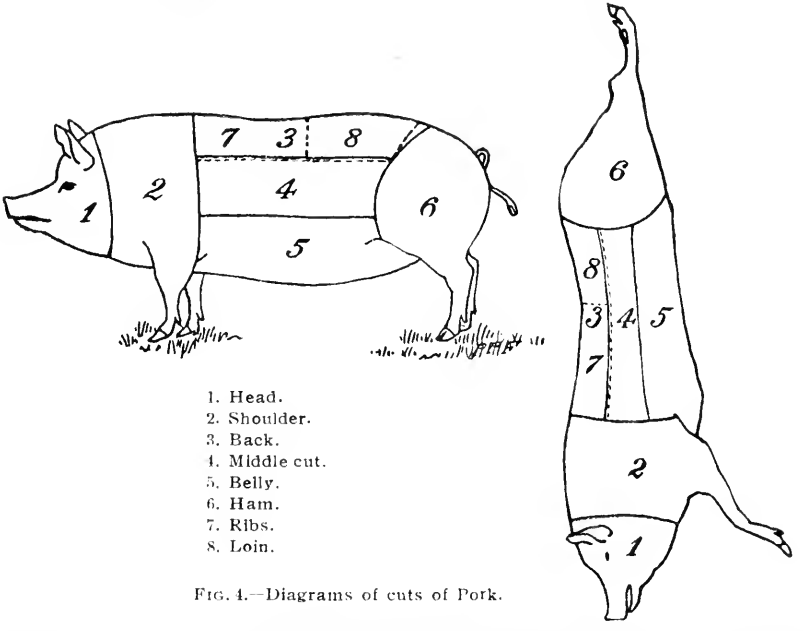
FIG. 3.—Diagrams of cuts of lamb and mutton.

"loin" and "chuck" in fig. 3, to make a cut designated as "rib," and a portion of the "flank" and "shoulder" to make a cut designated as "brisket." The term "chops" is ordinarily used to designate portions of either the loin, ribs, chuck or shoulder, which are either cut or "chopped" by the butcher into pieces suitable for frying or broiling. The chuck and ribs are sometimes called the "rack."

CUTS OF PORK.

The method of cutting up a side of pork differs considerably from that employed with other meats. A large portion of the carcass of a dressed pig consists of almost clear fat. This furnishes the cuts which are used for "salt pork" and bacon. Fig. 4 illustrates a common method of cutting up pork, showing the relative position of the cuts in the animal and in the dressed side. The cut designated as "back cut" is almost clear fat and is used for salting and pickling. The "middle cut" is the portion quite generally used for bacon and for "lean ends" salt pork. The belly is salted or pickled or may be made into sausages.

Beneath the "back cut" are the ribs and loin, from which are obtained "spareribs," "chops," and roasting pieces, here designated by dotted lines. The hams and shoulders are more frequently cured, but are also sold fresh as pork "steak." The tenderloin proper is a comparatively lean and very small strip of meat lying under



1. Head.
2. Shoulder.
3. Back.
4. Middle cut.
5. Belly.
6. Ham.
7. Ribs.
8. Loin.

FIG. 4.—Diagrams of cuts of Pork.

the bones of the loin and usually weighing a fraction of a pound. Some fat is usually trimmed off from the hams and shoulders, which is called "ham and shoulder fat," and is often used for sausages, etc. What is called "leaf lard," at least in some localities, comes from the inside of the back. It is the kidney fat.

As stated above, cuts as shown in the diagrams herewith correspond to those of which analyses are reported in the table beyond, but do not attempt to show the different methods of cutting followed in markes in different parts of the United States.

—*Extract, Farmers Bulletin No. 31.*

TABLE SHOWING THE DIGESTIBILITY OF DIFFERENT KINDS OF MEATS.

Kind of Meat	Method of Cooking	Mean time of Chymification H. M.
Turkey, domestic	Roasted	2:30
Beef, fresh, lean, rare	Roasted	3:00
Beefsteak	Broiled	3:30
Beef and salt only	Broiled	2:45
Beef with mustard	Broiled	3:00
Beef	Fried	4:00
Beef, old, hard	Broiled	4:15
Pork, steak	Broiled	3:15
Pork, fat and lean	Roasted	5:15
Pork, salted	Boiled	4:30
Pork, recently salted	Fried	4:15
Pork, recently salted	Broiled	3:15
Pork, recently salted	Raw	3:00
Pork, recently salted	Stewed	3:00
Mutton, fresh	Roasted	3:15
Mutton, fresh	Broiled	3:00
Veal, fresh	Broiled	4:00
Veal, fresh	Fried	4:30
Fowls, domestic	Boiled	4:00
Fowls, domestic	Roasted	4:00

National Food Magazine.

MEAT CUTS AND THEIR USES.

SOUP—

Hind Shank.
Fore Shank.
Neck and Tail.

STEWS—

Brisket.
Chuck.
Flank.
Shoulder.
Neck.
Plate.

ROASTS—

Rump.
Chuck Ribs.
Prime Ribs.

STEAKS—

Round.
Porter-house.
Sirloin.

Sautéd Meats

HAMBURG STEAK.

Chop fine one pound of lean beef, with two ounces of beef suet, add a few drops of onion juice if liked. Shape into small flat cakes 1 inch thick if liked rare, or ½ inch thick if liked well done.

Heat pan blue hot, grease lightly; add cakes, count 100, then turn and cook on the other side until brown. When well browned they are done if liked rare. Cook 10 minutes if liked well done. Salt, place on hot platter and dot with butter.

BEEF LOAF.

1 lb. uncooked beef, chopped fine,
Yolk of 1 egg,
1 T. chopped parsley,
1 T. butter,
2 T. bread crumbs,
1 t. lemon juice,
1 t. salt,
3 dashes of black pepper.
½ t. onion juice.

Mix all the ingredients together, then form into a roll about six inches long; wrap in buttered paper; place in a baking pan and bake in a quick oven about 30 m.; baste every 5 m. with ¼ of a cup of butter melted in one cup of boiling water; serve with brown mushroom sauce poured around it.

PORK CHOPS.

Wipe chops, place in a hot frying pan. When seared on one side, turn, season and cook slowly until tender and brown on both sides.

PAN GRAVY.

Pour off part of the fat, if there is too much in the pan. To 4 T. of fat add 2 T. flour, when bubbling add 1 c. of milk, stock or water. Cook until slightly thickened. Season to taste with salt and serve.

TOMATO SAUCE.

1 c. tomato,
½ c. water,
1 t. salt,
½ doz. peppercorns,
3 whole cloves,
¼ t. chopped onion,
1 ½ bay leaf,
2 T. butter,
2 T. flour.

Cook first seven ingredients for 20 minutes. Strain.

Melt butter, add flour and when bubbling add liquid and stir until it thickens. Serve with boiled macaroni, with meats, eggs or fish.

Broiling

BROILED STEAK.

Wipe, trim off extra fat. Broil over a clear fire, turning every 2 minutes. Cook 4 or 5 m. if liked rare; longer if well done.

Place on a hot platter and season.

Beef steak should be tender and cut 1 in. thick.

PAN-BROILING

Remove from the steak or chop extra fat, and the pink skin from mutton. Heat a frying pan very hot, and grease with very little fat. Put in the meat and cook 1 m.; turn it and brown the other side; then cook more slowly until done, 5 m., if liked rare. Stand chops on edge to brown the fat. Season and serve on a hot dish.

ROUND STEAK.

Have a slice of round steak ¾ of an inch thick. Wipe and trim off extra fat. Heat an iron frying pan blue hot, grease lightly, and put steak into it. Count 60, turn and let brown on under side; when brown on both sides half cover with boiling water, cover frying pan closely with a heavy cover and let simmer for from 20 to 30 m. Uncover, season with 2 T. butter, salt and pepper, and serve on a hot platter.

ONIONS FOR STEAK.

Allow 1 onion to a person. Remove skins and cut in thin slices across onion. Put fat from steak or 2 T. dripping in frying pan, when hot, add onions, cover and cook 15 min., or until tender and brown. Season and serve over steak.

BEEF BIRDS.

Cut 1 lb. of round steak ¼ of an inch thick in four pieces. Flatten each piece and spread with 1 t. fat bacon chopped, ¼ t. prepared mustard, ½ t. chopped onion, 1 spk. paprika. Roll each slice and fasten with either string or tooth picks. Brown each roll in fat or butter and add enough boiling water to cover. Simmer until nearly tender, then add salt according to taste and continue simmering until tender. Time required, 2½ to 3 hours.

Before serving, remove fat and sprinkle ½ T. of flour over beef birds. Allow to cook a few minutes; strain gravy, remove strings and serve very hot. Veal may be used in the same way. It does not require as long cooking as beef.

TO MAKE TENDER A TOUGH STEAK.

To transform a tough piece of beef steak into a nutritious and tender one, by a method employed in many of the first class hotels and restaurants, proceed as follows: Into a deep platter put about three tablespoonfuls of vinegar and one of pure olive oil, and lay the steak on it several hours before it is to be used, turning it every hour. If the steak is to be used for breakfast an excellent plan is to fix it the previous night and just before going to bed turn it over and add a little more vinegar and oil if the mixture has all been absorbed. The steak should be cooked without wiping it and then seasoned with butter, pepper and salt and garnished with slices of lemon and parsley.

Ways of Cooking Meats

Cooking is the art of preparing food by the aid of heat, for the nourishment of the human body. The principal ways of cooking are boiling, broiling, stewing, roasting, baking, frying, sautéing, braising, fricasseing and steaming.

BOILING: Cooking in boiling water. Boiling point, 212° F.

BROILING: Cooking over a glowing fire.

STEAMING: Cooking over boiling water.

STEWING: Cooking for a long time in water below the boiling point. Simmering point, 185° F.

ROASTING: Cooking before a glowing fire.

BAKING: Cooking in an oven.

FRYING: Cooking in hot fat, deep enough to cover article to be cooked.

SAUTÉING: Cooking in a small quantity of fat.

BRAISING: A combination of stewing and baking.

FRICASSEING: A combination of frying and stewing.

GENERAL METHODS OF PREPARING MEAT FOR THE TABLE.

The advantages of variety in the methods of preparing and serving are to be considered even more seriously in the cooking of the cheaper cuts than in the cooking of the more expensive ones, and yet even in this connection it is a mistake to lose sight of the fact that, though there is a great variety of dishes, the processes involved are few in number.

An experienced teacher of cooking, a woman who has made very valuable contributions to the art of cookery by showing that most of the numerous processes outlined and elaborately described in the cook books can be classified under a very few heads, says that she tries "to reduce the cooking of meat to its lowest terms and teach only three ways of cooking. The first is the application of intense heat to keep in the juices. This is suitable only for portions of clear meat where the fibers are tender. By the second method the meats are put in cold water and cooked at a low temperature. This is suitable for bone, gristle, and the toughest portions of the meat, which for this purpose should be divided into small bits. The third is a combination of these two processes and consists of searing and then stewing the meat. This is suitable for halfway cuts, i. e., those that are neither tender nor very tough." The many varieties of meat dishes are usually only a matter of flavor and garnish.

In other words, of the three processes the first is the short method; it aims to keep all the juices within the meat. The second is a very long method employed for the purpose of getting all or most of the juices out. The third is a combination of the two not so long as the second and yet requiring so much time that there is danger of the meat being rendered tasteless unless certain precautions are taken such as searing in hot fat or plunging into boiling water.

It is commonly said that the cooked meat fibers are harder or less tender than the raw, which seems a natural assumption since the meat protein, like egg albumen, is coagulated by heat, and furthermore, the water is forced out from the individual muscle fibers and they are shortened and thickened by the application of heat. Apparently, however, such general deductions must be modified on the basis of the experimental data obtained in Lehmann's laboratory, for he found marked differences in this respect between the interior cuts of beef, of which tenderloin is a typical example, and exterior cuts such as flank. When beef flank was cooked by boiling for two hours, the toughness of the fibers greatly increased during the first half hour of the cooking period, and then diminished so that at the end of the cooking period the meat was found to be in about the same condition with respect to toughness or tenderness of the fibers as at the beginning. On the other hand, in the case of the tenderloin, there was a decrease in toughness of the fibers throughout the cooking period which was particularly marked in the first few minutes of cooking, and at the end of the cooking period the meat fibers were only half as tough as before cooking.

A good idea of the changes which take place while meat is being cooked can be obtained by examining a piece of flesh which has been "cooked to pieces," as the saying goes. In this the muscular fibers may be seen completely separated one from another, showing that the connective tissue has been destroyed. It is also evident that the fibers themselves are of different texture from those in the raw meat. In preparing meat for the table it is usual to stop short of the point of disintegration, but while the long process of cooking is going on the connective tissue is gradually softening and the fibers are gradually changing in texture. The former is the thing to be especially desired, but the latter is not. For this reason it is necessary to keep the temperature below the boiling point and as low as is consistent with thorough cooking, for cooks seem agreed, as the result of experience shows, that slow gentle cooking results in better texture than is the case when meat is boiled rapidly. This is the philosophy that lies back of the simmering process.

* * * * * * *

UTILIZING THE FAT, BONE, AND TRIMMINGS IN MEATS, AND THE LEFT-OVER COLD MEATS.

In the percentage of fat present in different kinds and cuts of meat, a greater difference exists than in the percentage of proteids. The lowest percentage of fat shown [in a test made] was 8.1 per cent in the shank of beef; the highest was 32 per cent in the pork chops. The highest priced cuts, loin and ribs of beef, contain 20 to 25 per cent. If the fat of the meat is not eaten at the table, and is not utilized otherwise, a pecuniary loss results. If butter is the fat used in making crusts for meat pies, and in preparing the cheaper cuts, there is little economy involved; the fats from other meat should therefore be saved, as they may be used in place of butter in such cases, as well as in preparing many other foods. The fat from sausage or from the soup kettle, or from a pot roast, which is savory because it has been cooked with vegetables, is particularly acceptable. Sometimes savory vegetables, onion, or sweet herbs are added to fat when it is tried out to give it flavor.

Some illustrations of methods of preparing such cooking fats follow:

Trying Out Fat.

A double boiler is the best utensil to use in trying out small portions of fat. There is no danger of burning the fat and the odor is much less noticeable than if it is heated in a dish set directly over the fire.

Clarifying Fat.

Excepting where the purpose of clarifying fat is to remove flavors, a good method to follow is to pour boiling water over the fat, to boil thoroughly, and then to set it away to cool. The cold fat may be removed in a solid cake and any impurities clinging to it may be scraped off, as they will be found at the bottom of the layer. By repeating this process two or three times a cake of clean, white fat may be obtained.

A slight burned taste or similar objectionable flavors often can be removed from fat by means of potatoes. After melting the fat, put into it thick slices of raw potato; heat gradually. When the fat ceases to bubble and the potatoes are brown, strain through a cloth placed in a wire strainer.

Savory Drippings.

When rendering the drippings of fat meat, add a small onion (do not cut it), a few leaves of summer savory and thyme, a teaspoonful of salt, and a little pepper. This is enough for a pint of fat. Keep the drippings covered and in a cool place.

Uses for Bones.

Almost any meat bones can be used in soup making, and if the meat is not all removed from them the soup is better. But some

bones, especially the rib bones, if they have a little meat left on them, can be grilled or roasted into very palatable dishes. The "sparerib" of southern cooks is made of the rib bones from a roast of pork, and makes a favorite dish when well browned. The braised ribs of beef often served in high-class restaurants are made from the bones cut from rib roasts. In this connection it may be noted that many of the dishes popular in good hotels are made of portions of meat such as are frequently thrown away in private houses, but which with proper cooking and seasoning make attractive dishes and give most acceptable variety to the menu. An old recipe for "broiled bones" directs that the bones (beef ribs or sirloin bones on which the meat is not left too thick in any part) be sprinkled with salt and pepper (Cayenne), and broiled over a clear fire until browned. Another example of the use of bones is boiled marrow bone. The bones are cut in convenient lengths, the ends covered with a little piece of dough over which a floured cloth is tied, and cooked in boiling water for two hours. After removing the cloth and dough, the bones are placed upright on toast and served. Prepared as above, the bones may also be baked in a deep dish. Marrow is sometimes removed from bones after cooking, seasoned, and served on toast.

Trimmings from meat may be utilized in various "made dishes," of which examples will be given further on, or they can always be put to good use in the soup kettle. It is surprising how many economies may be practiced in such ways and also in the table use of left-over portions of cooked meat if attention is given to the matter. Many of the recipes given in this bulletin involve the use of such left-overs. Others will suggest themselves or may be found in all the usual cookery books.

METHODS OF EXTENDING THE FLAVOR OF MEAT.

Common household methods of extending the meat flavor through a considerable quantity of material which would otherwise be lacking in distinctive taste are to serve the meat with dumplings, generally in the dish with it, to combine the meat with crusts, as in meat pies or meat rolls, or to serve the meat on toast and biscuits. Borders of rice, hominy, or mashed potatoes are examples of the same principles applied in different ways. By serving some preparation of flour, rice, hominy, or other food rich in starch with the meat we get a dish which in itself approaches nearer to the balanced ration than meat alone and one in which the meat flavor is extended through a large amount of the material.

Throughout the bulletin the measurements given in the recipes call for a level spoonful or a level cupful, as the case may be.

USE OF DUMPLINGS AND SIMILAR PREPARATIONS.

A number of recipes for meat dishes made with dumplings and similar preparations follow:

Meat Stew with Dumplings.

Stew.

5 pounds of a cheaper cut of beef.
4 cups of potatoes cut into small pieces.
⅔ cup each of turnips and carrots cut into ½-inch cubes.
½ onion, chopped.
¼ cup of flour.
Salt and pepper.

Cut the meat into small pieces, removing the fat; try out the fat and brown the meat in it. When well browned, cover with boiling water, boil for five minutes and then cook in a lower temperature until the meat is done. If tender, this will require about three hours on the stove or five hours in the fireless cooker. Add carrots, turnips, onions, pepper, and salt during the last hour of cooking, and the potatoes fifteen minutes before serving. Thicken with the flour diluted with cold water. Serve with dumplings (see below). If this dish is made in the fireless cooker, the mixture must be reheated when the vegetables are put in. Such a stew may also be made of mutton. If veal or pork is used the vegetables may be omitted or simply a little onion used. Sometimes for variety the browning of the meat is dispensed with. When white meat, such as chicken, veal, or fresh pork, is used, the gravy is often made rich with cream or milk thickened with flour. The numerous minor additions which may be introduced give the great variety of such stews found in cookbooks.

Dumplings.

2 cups flour.
4 teaspoonfuls baking powder.
⅔ cup milk or a little more if needed.
½ teaspoonful salt.
2 teaspoonfuls butter.

Mix and sift the dry ingredients. Work in the butter with the tips of fingers, add milk gradually, roll out to a thickness of one-half and cut with biscuit cutter. In some countries it is customary to season the dumplings themselves with herbs, etc., or to stuff them with bread crumbs fried in butter instead of depending upon the gravy to season them.

A good way to cook dumplings is to put them in a buttered steamer over a kettle of hot water. They should cook from twelve to fifteen minutes. If it is necessary to cook them with the stew, enough liquid should be removed so that they may be placed upon the meat and vegetables.

Sometimes the dough is baked and served as biscuits over which the stew is poured. If the stew is made with chicken or veal it is generally termed a fricasee.

Ragout of Mutton with Farina Balls.

1½ pounds neck of mutton cut into small pieces.
1 tablespoonful butter.
1 tablespoonful flour.
1 onion.
1 carrot.
½ can peas.
2 cups hot water.
1 teaspoonful salt.
¼ teaspoonful pepper.
1 bay leaf.
Sprig parsley.
1 clove.

Farina Balls.

¼ cup farina.
1 cup milk.
¼ teaspoonful salt.
⅛ teaspoonful pepper.
Onion juice.
Yolk 1 egg.

Put butter in frying pan. When melted add flour and brown. Add carrot and onion, cut in dice. Remove vegetables and add meat, searing well. To meat and vegetables add hot water and seasonings. Put in a suitable kettle, cover and simmer two hours. Add peas ten minutes before serving in a dish with farina balls made as follows:

Cook farina and milk in double boiler one hour. Add seasoning and well-beaten yolk. Stir well and cool. When cold roll into balls. Dip in egg and crumbs and fry in deep fat. Rice may be used in a similar way.

MEAT PIES AND SIMILAR DISHES.

Meat pies represent another method of combining flour with meat. They are ordinarily baked in a fairly deep dish the sides of which may or may not be lined with dough. The cooked meat, cut into small pieces, is put into the dish, sometimes with small pieces of vegetables, a gravy is poured over the meat, the dish is covered with a layer of dough, and then baked. Most commonly the dough is like that used for soda or cream-of-tartar biscuit, but sometimes shortened pastry dough, such as is made for pies, is used. This is especially the case in the fancy individual dishes usually called patties. Occasionally the pie is covered with a potato crust in which case the meat is put directly into the dish without lining the latter. Stewed beef, veal, and chicken are probably most frequently used in pies, but any kind of meat may be used, or several kinds in combination. Pork pies are favorite dishes in many rural regions, especially at hog-killing time, and when well made are excellent.

If pies are made from raw meat and vegetables longer cooking is needed than otherwise, and in such cases it is well to cover the dish with a plate, cook until the pie is nearly done, then remove the plate, add the crust, and return to the oven until the crust is lightly browned. Many cooks insist on piercing holes in the top crust of a meat pie directly it is taken from the oven.

Twelve O'clock Pie.

This is made with shoulder of mutton, boiled with carrot and onion, then cut up, mixed with potatoes separately boiled and cut up, and put into a baking dish. The crust is made by mixing smoothly mashed potatoes to which a tablespoonful of shortening has been added, with enough flour and water to make them roll out easily. A pie made of a pound of meat will require 5 or 6 small boiled potatoes, a cupful of mashed potatoes, and 8 or 10 tablespoonfuls of flour, and should be baked about twenty minutes in a hot oven. Salt, pepper, and other seasoning, as onion and carrot, may be added to taste. A teaspoonful of baking powder makes the crust lighter.

Meat and Tomato Pie.

This dish presents an excellent way of using up small quantities of either cold beef or cold mutton. If fresh tomatoes are used, peel and slice them; if canned, drain off the liquid. Place a layer of tomato in a

baking dish, then a layer of sliced meat, and over the two dredge flour, pepper, and salt; repeat until the dish is nearly full, then put in an extra layer of tomato and cover the whole with a layer of pastry or of bread or cracker crumbs. When the quantity of meat is small, it may be "helped out" by boiled potatoes or other suitable vegetables. A few oysters or mushrooms improve the flavor, especially when beef is used. The pie will need to be baked from half an hour to an hour according to its size and the heat of the oven.

Meat and Pastry Rolls.

Small quantities of cold ham, chicken, or other meat may be utilized for these. The meat should be chopped fine, well seasoned, mixed with enough savory fat or butter to make it "shape," and formed into rolls about the size of a finger. A short dough (made, say, of a pint of flour, 2 tablespoonfuls of lard, 1 teaspoonful of baking powder, salt, and milk enough to mix) should be rolled thin, cut into strips, and folded about the meat rolls, care being taken to keep the shape regular. The rolls should be baked in a quick oven until they are a delicate brown color and served hot.

Meat Turnovers.

Almost any kind of chopped meat may be used in these, and if the quantity on hand is small may be mixed with potato or cooked rice. This filling should be seasoned to taste with salt and pepper, onion, or whatever is relished, and laid on pieces of short biscuit dough rolled thin and cut into circles about the size of an ordinary saucer. The edges of the dough should be moistened with white of egg, the dough then folded over the meat, and its edges pinched closely together. If desired, the tops of the turnovers may be brushed over with yolk of egg before they are placed in the oven. About half an hour's baking in a hot oven is required. Serving with a brown sauce increases the flavor and moistens the crust.

MEAT WITH MACARONI AND OTHER STARCHY MATERIALS.

Macaroni cooked with chopped ham, hash made of meat and potatoes or meat and rice, meat croquettes—made of meat and some starchy materials like bread crumbs, cracker dust, or rice—are other familiar examples of meat combined with starchy materials. Pilaf, a dish very common in the Orient and well known in the United States, is of this character and easily made. When there is soup or soup stock on hand it can be well used in the pilaf.

Turkish Pilaf.

½ cup of rice.
¾ cup of tomatoes stewed and strained.
1 cup stock or broth.
3 tablespoonfuls of butter.

Cook the rice and tomatoes with the stock in a double boiler until the rice is tender, removing the cover after the rice is cooked if there is too much liquid. Add the butter and stir it in with a fork to prevent the rice from being broken. A little catsup or Chili sauce with water enough to make three-quarters of a cup may be substituted for the tomatoes. This may be served as a border with meat, or served separately in the place of a vegetable, or may make the main dish at a meal, as it is savory and reasonably nutritious.

Meat Cakes.

1 pound chopped veal.
¼ pound soaked bread crumbs.
2 tablespoonfuls savory fat or butter.
1 teaspoonful chopped onion.
1½ teaspoonfuls salt.
Dash of pepper.

Mix all the ingredients except the butter or fat and shape into small round cakes. Melt the fat in a baking pan and brown the cakes in it, first one side and then the other. Either cooked or raw veal may be used. In the case of raw meat the pan should be covered so that the heat may be retained to soften the meat.

Stew from Cold Roast.

This dish provides a good way of using up the remnants of a roast, either of beef or mutton. The meat should be freed from fat, gristle, and bones, cut into small pieces, slightly salted, and put into a kettle with water enough to nearly cover it. It should simmer until almost ready to break in pieces, when onions and raw potatoes, peeled and quartered, should be added. A little soup stock may also be added if available. Cook until the potatoes are done, then thicken the liquor or gravy with flour. The stew may be attractively served on slices of crisp toast.

MEAT WITH BEANS.

Dry beans are very rich in protein, the percentage being fully as large as that in meat. Dry beans and other similar legumes are usually cooked in water, which they absorb, and so are diluted before serving; on the other hand, meats by the ordinary methods of cooking are usually deprived of some of the water originally present—facts which are often overlooked in discussing the matter. Nevertheless, when beans are served with meat the dish is almost as rich in protein as if it consisted entirely of meat.

Pork and beans is such a well-known dish that recipes are not needed. Some cooks use a piece of corned mutton or a piece of corned beef in place of salt or corned pork or bacon or use butter or olive oil in preparing this dish.

In the Southern States, where cowpeas are a common crop, they are cooked in the same way as dried beans. Cowpeas baked with salt pork or bacon make an excellent dish resembling pork and beans, but of distinctive flavor. Cowpeas boiled with ham or with bacon are also well-known and palatable dishes.

Recipes are here given for some less common meat and bean dishes.

Mexican Beef.

The Mexicans have a dish known as "Chili con carne" (meat with Chili pepper), the ingredients for which one would doubtless have difficulty in obtaining except in the southwestern United States. However, a good substitute for it may be made with the foods available in all parts of the country. The Mexican recipe is as follows:

Remove the seeds from two Chili peppers, soak the pods in a pint of warm water until they are soft, scrape the pulp from the skin and add to the water. Cut two pounds of beef into small pieces and brown in butter or drippings. Add a clove of garlic and the Chili water. Cook until the meat is tender, renewing the water if necessary. Thicken the sauce with

flour. Serve with Mexican beans either mixed with the meat or used as a border.

In the absence of the Chili peppers, water and Cayenne pepper may be used, and onions may be substituted for garlic. For the Mexican beans, red kidney beans either fresh or canned make a good substitute. If the canned beans are used they should be drained and heated in a little savory fat or butter. The liquid may be added to the meat while it is cooking. If the dried beans are used they should be soaked until soft, then cooked in water until tender and rather dry, a little butter or dripping and salt being used for seasoning or gravy. White or dried Lima beans may be used in a similar way.

Mexican Chili Con Carne.

3 quarts of boiling water.
2½ pounds hamburger.
½ pound suet, ground.
Add to hamburger.
1 large red pepper.
1 large green pepper.
1 large yellow pepper.
3 toes of garlic.
2 cans tomatoes.
3 cans of kidney beans.
2 good sized onions.
½ coffee cup flour.
½ cup of vinegar.
3 tablespoonfuls sugar.
3 T. salt.
1 t. Cayenne pepper.
¼ cake margarine powder or cake.
2 T. kimmel.

Mix hamburger and suet; add to boiling water, add peppers and onions and garlic ground in a meat chopper or cut fine in a bowl, also add tomatoes; put in a large kettle (or what is better, use a fireless cooker), and cook at moderate temperature of heat 45 m., then take vinegar, flour, cayenne pepper, sugar, salt, margarine; mix together, making a smooth paste, add to above ingredients and stir constantly 5 m.; cover tightly and set back and on stove and cook ten minutes longer, add kimmel just before serving.

—*De Motter.*

Haricot of Mutton.

2 tablespoonfuls of chopped onions.
2 tablespoonfuls of butter or drippings.
2 cups of water, and salt and pepper.
1½ pounds of lean mutton or lamb cut into 2-inch pieces.

Fry the onions in the butter, add the meat, and brown; cover with water and cook until the meat is tender. Serve with a border of Lima beans, seasoned with salt, pepper, butter, and a little chopped parsley. Fresh, canned, dried, or evaporated Lima beans may be used in making this dish.

Roast Pork with Cowpeas.

For this dish a leg of young pork should be selected. With a sharp knife make a deep cut in the knuckle and fill the opening with sage, pepper, salt, and chopped onion. When the roast is half done scar the skin but do not cut deeper than the outer rind. When the meat is nearly cooked pour off the excess of fat and add a quart of white cowpeas which have been previously parboiled or "hulled" and cook slowly until quite done and the meat is brown. Apple sauce may be served with this dish.

MEAT SALADS.

Whether meat salads are economical or not depends upon the way in which the materials are utilized. If in chicken salad, for example, only the white meat of chickens especially bought for the

purpose and only the inside stems of expensive celery are used, it can hardly be cheaper than plain chicken. But, if portions of meat left over from a previous serving are mixed with celery grown at home, they certainly make an economical dish, and one very acceptable to most persons. Cold roast pork or tender veal—in fact, any white meat can be utilized in the same way. Apples cut into cubes may be substituted for part of the celery; many cooks consider that with the apple the salad takes the dressing better than with the celery alone. Many also prefer to marinate (i. e., mix with a little oil and vinegar) the meat and celery or celery and apples before putting in the final dressing, which may be either mayonnaise or a good boiled dressing.

MEAT WITH EGGS.

Occasionally eggs are combined with meat, making very nutritious dishes. Whether this is an economy or not of course depends on the comparative cost of eggs and meat.

In general, it may be said that eggs are cheaper food than meat when a dozen costs less than 1½ pounds of meat, for a dozen eggs weighs about 1½ pounds and the proportions of protein and fat which they contain are not far different from the proportions of these nutrients in the average cut of meat. When eggs are 30 cents a dozen they compare favorably with round of beef at 20 cents a pound.

Such common dishes as ham and eggs, bacon or salt pork and eggs, and omelette with minced ham or other meat are familiar to all cooks.

Roast Beef with Yorkshire Pudding.

The beef is roasted as usual and the pudding made as follows:

Yorkshire Pudding.

3 eggs.
1 pint milk.
1 cupful flour.
1 teaspoonful salt.

Beat the eggs until very light, then add the milk. Pour the mixture over the flour, add the salt, and beat well. Bake in hissing hot gem pans or in an ordinary baking pan for forty-five minutes, and baste with drippings from the beef. If gem pans are used, they should be placed on a dripping pan to protect the floor of the oven from the fat. Many cooks prefer to make Yorkshire pudding in the pan with the meat; in this case the roast should be placed on a rack and the pudding batter poured on the pan under it.

Corned-Beef Hash with Poached Eggs.

A dish popular with many persons is corned-beef hash with poached eggs on top of the hash. A slice of toast is sometimes used under the hash. This suggests a way of utilizing the small amount of corned-beef hash which would otherwise be insufficient for a meal.

Housekeepers occasionally use up odd bits of other meat in a similar way, chopping and seasoning them and then warming and serving in individual baking cups with a poached or shirred egg on each.

Ham and Poached Eggs with Cream Sauce.

A more elaborate dish of meat and eggs is made by placing a piece of thinly sliced boiled ham on a round of buttered toast, a poached egg on the ham, and covering with a highly seasoned cream or a Hollandaise sauce. A slice of tongue may be used instead of the ham. If preferred, a well-seasoned and rather thick tomato sauce or curry sauce may be used.

STUFFING OR FORCEMEAT.

Another popular way to extend the flavor of meat over a large amount of food is by the use of stuffing or forcemeat (a synonym more common in England than in the United States). As it is impossible to introduce much stuffing into some pieces of meat even if the meat is cut to make a pocket for it, it is often well to prepare more than can be put into the meat and to cook the remainder in the pan beside the meat. Some cooks cover the extra stuffing with buttered paper while it is cooking and baste it at intervals.

Some recipes for meat dishes of this character follow, and others will be found in cook books.

Mock Duck.

Mock duck is made by placing on a round steak a stuffing of bread crumb well seasoned with chopped onions, butter, chopped suet or dripping, salt, pepper, and a little sage, if the flavor is relished. The steak is then rolled around the stuffing and tied with a string in several places. If the steak seems tough, the roll is steamed or stewed until tender before roasting in the oven until brown. Or it may be cooked in a casserole or other covered dish, in which case a cupful or more of water or soup-stock should be poured around the meat. Mock duck is excellent served with currant or other acid jelly.

Mock Wild Duck.

1 flank steak, or
1½ pounds round steak cut ½ inch thick.
2 lamb kidneys.
¼ cup butter or drippings.
½ cup cracker crumbs.
1 tablespoonful minced onion.
Salt, pepper, and powdered thyme, sage, and savory.
2 tablespoonfuls flour.
1 tablespoonful sugar.
3 cupfuls water or stock.

Trim the kidneys of all fat, cords, and veins. Cut into small pieces and spread evenly over one side of the steak together with the crumbs, onion, and seasonings. Roll and tie with a cord. Brown the roll in fat, then remove and make a gravy by heating the flour in the fat and adding three cupfuls of stock or water and the sugar. Put the meat into the gravy and cook slowly until tender in a covered baking dish, a steamer, or a fireless cooker. If steamed or cooked in a fireless cooker, the roll should be browned in the oven before serving.

UTILIZING THE CHEAPER CUTS OF MEATS IN PALATABLE DISHES.

When the housekeeper attempts to reduce her meat bill by using the less expensive cuts, she commonly has two difficulties to contend with—toughness and lack of flavor. It has been shown how prolonged cooking softens the connective tissues of the meat. Pounding the meat and chopping it are also employed with tough cuts, as they

help to break the muscle fibers. As for flavor, the natural flavor of meat even in the least desirable cuts may be developed by careful cooking, notably by browning the surface, and other flavors may be given by the addition of vegetables and seasoning with condiments of various kinds.

Methods of preparing inexpensive meat dishes will be discussed and practical directions for them will be given in the following sections. As often happens, two or three methods may be illustrated by the same dish, but the attempt has been made to group the recipes according to their most salient feature.

PROLONGED COOKING AT LOW HEAT.

Meat may be cooked in water in a number of ways without being allowed to reach the boiling point. With the ordinary kitchen range this is accomplished by cooking on the cooler part of the stove rather than on the hottest part, directly over the fire. Experience with a gas stove, particularly if it has a small burner known as a "simmerer," usually enables the cook to maintain temperatures which are high enough to sterilize the meat if it has become accidentally contaminated in any way and to make it tender without hardening the fibers. The double boiler would seem to be a neglected utensil for this purpose. Its contents can easily be kept up to a temperature of 200° F., and nothing will burn. Another method is by means of the fireless cooker. In this a high temperature can be maintained for a long time without the application of fresh heat. Still another method is by means of a closely covered baking dish. Earthenware dishes of this kind suitable for serving foods as well as for cooking are known as casseroles. For cooking purposes a baking dish covered with a plate or a bean jar covered with a saucer may be substituted. The Aladdin oven has long been popular for the purpose of preserving temperatures which are near the boiling point and yet do not reach it. It is a thoroughly insulated oven which may be heated either by a kerosene lamp or a gas jet.

In this connection directions are given for using some of the toughest and least promising pieces of meat.

Stewed Shin of Beef.

4 pounds of shin of beef.
1 medium-sized onion.
1 whole clove and a small bay leaf.
1 sprig of parsley.
1½ tablespoonfuls of flour.
1 small slice of carrot.
½ tablespoonful of salt.
½ teaspoonful of pepper.
2 quarts of boiling water.
1½ tablespoonfuls of butter or savory drippings.

Have the butcher cut the bone in several pieces. Put all the ingredients but the flour and butter into a stewpan and bring to a boil. Set the pan where the liquid will just simmer for six hours, or after boiling for five or ten minutes, put all into the fireless cooker for eight or nine hours. With the butter, flour, and one-half cupful of the clear soup from which the fat has been removed, make a brown sauce; to this add the

meat and the marrow removed from the bone. Heat and serve. The remainder of the liquid in which the meat has been cooked may be used for soup.

Boiled Beef with Horse-radish Sauce.

Plain boiled beef may also be served with horse-radish sauce, for which a recipe is given, and makes a palatable dish. A little chopped parsley sprinkled over the meat when served is considered an improvement by many persons. For the sake of variety the meat may be browned like pot roast before serving.

Scotch Broth.

3 pounds mutton.
2 tablespoonfuls of pearl barley.
2 tablespoonfuls of minced onion.
2 tablespoonfuls of minced turnip.
2 tablespoonfuls of minced carrot.
2 tablespoonfuls of minced celery.
2 tablespoonfuls of salt.
1 teaspoonful of pepper.
1 tablespoonful of minced parsley.
3 quarts cold water.

Remove the bones and all the fat from the mutton, cut the meat into small pieces and put it into a stewpan with the water, chopped vegetables, barley, and all the seasoning excepting the parsley. It will be found convenient to tie the bones in a piece of thin white cloth before adding them to the other ingredients. Bring the stew to a boil, quickly skim it and allow it to simmer for three hours, thicken with the flour, and add the chopped parsley.

Stuffed Heart.

Wash the heart thoroughly inside and out, stuff with the following mixture, and sew up the opening: One cup broken bread dipped in fat and browned in the oven, 1 chopped onion, and salt and pepper to taste.

Cover the heart with water and simmer until tender or boil ten minutes and set in the fireless cooker for six or eight hours. Remove from the water about one-half hour before serving. Dredge with flour, pepper, and salt, or sprinkle with crumbs and bake until brown.

Braised Beef, Pot Roast, and Beef a la Mode.

The above names are given to dishes made from the less tender cuts of meat. They vary little either in composition or method of preparation. In all cases the meat is browned on the outside to increase the flavor and then cooked in a small amount of water in a closely covered kettle or other receptacle until tender. The flavor of the dish is secured by browning the meat and by the addition of the seasoning vegetables. Many recipes suggest that the vegetables be removed before serving and the liquid be thickened. As the vegetables are usually extremely well-seasoned by means of the browned fat and the extracts of the meat, it seems unfortunate not to serve them.

Of course, the kind, quality, and shape of the meat all play their part in the matter. Extra time is needed for meats with a good deal of sinew and tough fibers such as the tough steaks, shank cuts, etc.; and naturally a fillet of beef, or a steak from a prime cut, will take less time than a thick piece from the shin. Such dishes require more time and perhaps more skill in their preparation and may involve more expense for fuel than the more costly cuts, which like chops or tender steaks may be quickly cooked, but to the epicure, as well as to the average man, they are palatable when rightly prepared.

Bean-Pot Roast.

3 pounds mutton (shoulder), or
3 pounds round, or chuck steak.
1 cup carrots cut into small pieces.
1 cup potatoes cut into small pieces.
¼ cup sliced onion.

Cover the meat with boiling water. Place the cover on the bean pot and let the meat cook in a moderate oven for two hours; then add the vegetables cut in half-inch cubes, with 2 teaspoonfuls salt; cook until the vegetables are tender, which will require about one hour; then serve, pouring a sauce over the meat, made from 1 cup of the liquid in which the meat was cooked, thickened with 2 tablespoonfuls of flour.

Hungarian Goulash.

2 pounds top round of beef.
A little flour.
2 ounces salt pork.
2 cups tomatoes.
1 stalk celery.
1 onion.
2 bay leaves.
6 whole cloves.
6 peppercorns.
1 blade mace.

Cut the beef into 2-inch pieces and sprinkle with flour; fry the salt pork until light brown; add the beef and cook slowly for about thirty-five minutes, stirring occasionally. Cover with water and simmer about two hours; season with salt and pepper or paprika.

From the vegetables and spices a sauce is made as follows: Cook in sufficient water to cover for twenty minutes; then rub through a sieve, and add to some of the stock in which the meat was cooked. Thicken with flour, using 2 tablespoonfuls (moistened with cold water) to each cup of liquid, and season with salt and paprika.

Serve the meat on a platter with the sauce poured over it. Potatoes, carrots, and green peppers cooked until tender, and cut into small pieces or narrow strips, are usually sprinkled over the dish when served, and noodles may be arranged in a border upon the platter.

Goulash is a Hungarian dish which has come to be a favorite in the United States.

CASSEROLE COOKERY.

A casserole is a heavy earthenware dish with a cover. A substitute for it can easily be improvised by using any heavy earthenware dish with a heavy plate for the cover. A casserole presentable enough in appearance to be put on the table serves the double purpose of baking and serving dish.

A suitable cut of beef or veal, and it may well be one of the cheaper cuts, as the long, slow cooking insures tenderness, may be cooked in a casserole.

Poultry and other meats besides beef or veal can be cooked in this manner. Chicken cooked in a casserole, which is a favorite and expensive dish in good hotels and restaurants, may be easily prepared in the home, and casserole cookery is to be recommended for a tough chicken.

The heat must be moderate and the cooking must occupy a long time. Hurried cooking in a casserole is out of the question. If care is taken in this particular, and suitable seasonings are used, few who know anything of cooking should go astray.

Chopped meat also may be cooked in a casserole and this utensil is particularly useful for the purpose, because the food is served in the same dish in which it is cooked and may easily be kept hot, a point which is important with chopped meats, which usually cool rapidly.

Casserole Roast.

3 or 4 pounds of round or rump of beef.
A slice of salt pork.
A few peppercorns.
One-fourth each of a carrot, a turnip, an onion, and a head of celery cut into small pieces.

Try out the pork. Brown the meat on both sides in the fat. Put in a casserole with the vegetables around it, add 2 cupfuls of water or stock. Cover and cook in a hot oven three hours, basting occasionally. A sauce or gravy can be made with water, flour, and some of the juice left in the casserole.

Casserole or Italian Hash.

Boil one-fourth pound of macaroni, drain and put into a buttered casserole, add a little butter and grated cheese. Push the macaroni to the sides of the dish and fill the center with chopped cooked meat seasoned to suit the taste of the family. A little sausage gives a good flavor to this dish. Place in the oven until hot throughout and serve.

A very good modification of this is made by using raw instead of cooked meat. For this one-half pound of round steak is sufficient for a family of six. This should be cut into small pieces, browned, and cooked until tender in water with the onions and other seasonings. An hour before the cooking is complete, add one-half can of tomatoes. Before serving, the meat may be mixed with the sauce, and the whole is poured over the macaroni.

MEAT COOKED WITH VINEGAR.

Dishes of similar sort as regards cooking, but in which vinegar is used to give flavor as well as to soften the meat and make it tender, are the following:

Sour Beef.

Take a piece of beef from the rump or the lower round, cover with vinegar or with a half-and-half mixture of vinegar and water, add sliced onion, bay leaves, and a few mixed whole spices and salt. Allow to stand a week in winter or three or four days in summer; turn once a day and keep covered. When ready to cook, brown the meat in fat, using an enameled iron pan, strain the liquid over it and cook until tender; thicken the gravy with flour or ginger snaps (which may be broken up first), strain it, and pour over the sliced meat. Some cooks add cream.

Sour Beefsteak.

Round steak may be cooked in water in which there is a little vinegar, or if the time is sufficient, it may be soaked for a few hours in vinegar and water and then cooked in a casserole or in some similar way.

POUNDED MEAT.

Pounding meat before cooking is an old-fashioned method of making it tender, but while it has the advantage of breaking down the tough tissues it has the disadvantage of being likely to drive out the juices and with them the flavor. A very good way of escaping this difficulty is pounding flour into the meat; this catches and retains the juices. Below are given the recipes for two palatable dishes in which this is done:

Farmer Stew.

Pound flour into both sides of a round steak, using as much as the meat will take up. This may be done with a meat pounder or with the edge of a heavy plate. Fry in drippings, butter, or other fat in a Scotch bowl, or if more convenient in an ordinary iron kettle or a frying pan; then add water enough to cover it. Cover the dish very tightly so that the steam can not escape and allow the meat to simmer for two hours or until it is tender. One advantage of this dish is that ordinarily it is ready to serve when the meat is done as the gravy is already thickened. However, if a large amount of fat is used in the frying, the gravy may not be thick enough and must be blended with flour.

Spanish Beefsteak.

Take a piece of round steak weighing 2 pounds and about an inch thick; pound until thin, season with salt and Cayenne pepper, cover with a layer of bacon or salt pork, cut into thin slices, roll and tie with a cord. Pour around it half a cupful of milk and half a cupful of water. Place in a covered baking dish and cook two hours, basting occasionally.

CHOPPED MEAT.

Chopping meat is one of the principal methods of making tough and inexpensive meat tender, i. e., dividing it finely and thus cutting the connective tissue into small bits. Such meats have another advantage in that they may be cooked quickly and economically.

In broiling chopped meat the fact should be kept in mind that there is no reason why it should not be cooked like the best and most expensive tenderloin. The only reason that ever existed for difference in treatment was the toughness of the connective tissue, and this feature has been overcome by the chopping. The ideal to be reached in broiling steak is to sear the surface very quickly, so that the juices which contain the greater part of the flavoring of the meat shall be kept in, and then to allow the heat to penetrate to the inside until the whole mass is cooked to the taste of the family. To pass the point where the meat ceases to be puffy and juicy and becomes flat and hard is very undesirable, as the palatability is then lost. Exactly the same ideal should be kept in mind in broiling chopped meat. If this were always done, hard, compact, tasteless balls or cakes of meat would be served less often. To begin with, the broiler should be even more carefully greased than for a whole steak. This makes it possible to form the balls or cakes of chopped meat with very little pressure without running the risk of having them pulled to pieces by adhering to the wires of the broiler. They should be heated on both sides even more quickly than the steak, because the chopping has provided more ways of escape for the juice, and these openings should be sealed as soon as possible. The interior should be cooked to the taste of the family just as the steak is.

In regard to broiling it may incidentally be noted that housekeepers often make themselves unnecessary work when broiling under gas by allowing the juice from steaks or meat balls to drop into the large pan under the rack. A smaller pan set in the larger one may be made to catch all the juice and fat and is much easier to wash. It serves also to economize the gravy.

Chopped raw meat of almost any kind can be very quickly made into a savory dish by cooking it with water or with water and milk for a short time, then thickening with butter and flour, and adding different seasonings as relished, either pepper and salt alone, or onion juice, celery, or tomato. Such a dish may be made to "go further" by serving it on toast or with a border of rice or in some similar combination.

Tough Portions of Porterhouse Steak.

Before speaking of the cooking of the cuts that lack tenderness throughout, it may be well to refer to the fact that the flank end of the porterhouse is to be classed with the toughest of cuts and with those which, when cooked alone, are with difficulty made tender even by long heating. Mock duck, which is commonly made of flank steak, can be rendered tender enough to be palatable only by long steaming or cooking in water, and yet people quite generally broil this part of the steak with the tenderloin and expect it to be eaten. The fact is that to broil this part of the porterhouse steak is not good management. It is much more profitable to put it into the soup kettle or to make it into a stew. In families where most of the members are away during the day the latter is a good plan, for the end of a steak makes a good stew for two or three people. This may be seasoned with vegetables left from dinner, or two or three olives cut up in gravy will give a very good flavor; or a few drops of some one of the bottled meat sauces, if the flavor is relished, or a little Chili sauce may be added to the stew. But if the tough end of a porterhouse is needed with the rest, a good plan is to put it through a meat grinder, make it into balls, and broil it with the tender portions. Each member of the family can then be served with a piece of the tenderloin and a meat ball. If the chopped meat is seasoned with a little onion juice, grated lemon rind, or chopped parsley, a good flavor is imparted to the gravy.

Hamburg Steak.

This name is commonly given to inexpensive cuts of beef chopped, seasoned a little, shaped into small balls or into one large thin cake, and quickly broiled in the way that a tender steak would be. Owing to the quick cooking much of the natural flavor of the meat is developed and retained. The fact should be kept in mind that Hamburg steak must be made from fresh, well-ground meat. It is much safer to chop the meat at home, as chopped meat spoils very quickly. Much depends, too, upon browning it sufficiently to bring out the flavors. Many cooks think that Hamburg steak is improved if the meat is mixed with milk before it is cooked.

In some parts of the country, and particularly in some of the Southern States, two kinds of beef are on sale. One is imported from other parts of the country and is of higher price. The other, known locally as "native beef," is sometimes lacking in flavor and in fat and is usually tougher. Southern native beef such as is raised in Florida is almost invariably, however, of extremely good flavor, due presumably to the feed or other conditions under which it is raised. By chopping such meat and cooking it as Hamburg steak, a dish almost as palatable as the best cuts of the more expensive beef may be obtained. In such cases, however, it is desirable because of the low percentage of fat to add suet or butter to the meat. The reason for this is that in the cooking the water of the juice when unprotected by fat evaporates too quickly and leaves the meat dry. This may be prevented by adding egg as well as fat, for the albumen of the egg hardens quickly and tends to keep in the juices. The proportion should be 1 egg to 1½ pounds of meat.

Savory Rolls.

Savory rolls in great variety are made of chopped meat either with or without egg. The variety is secured by the flavoring materials used and by the sauces with which the baked rolls are served. A few recipes will be given below. While these definite directions are given it should be remembered that a few general principles borne in mind make recipes unnecessary and make it possible to utilize whatever may happen to be on hand. Appetizing rolls are made with beef and pork mixed. The

proportion varies from two parts of beef and one of pork to two of pork and one of beef. The rolls are always improved by laying thin slices of salt pork or bacon over them, which keep the surface moistened with fat during the roasting. These slices should be scored on the edge, so that they will not curl up in cooking. The necessity for the salt pork is greater when the chopped meat is chiefly beef than when it is largely pork or veal. Bread crumbs or bread moistened in water can always be added, as it helps to make the dish go farther. When onions, green peppers, or other vegetables are used, they should always be thoroughly cooked in fat before being put in the roll, for usually they do not cook sufficiently in the length of time it takes to cook the meat. Sausage makes a good addition to the roll, but it is usually cheaper to use unseasoned pork meat with the addition of a little sage.

Cannelon of Beef, Paper Bags.

This dish is prepared by making chopped beef into a roll and baking it wrapped in a buttered paper, a method designed to keep in the steam and so insure a moist, tender dish. The paper must be removed before serving. The roll should be basted occasionally with butter and water or drippings and water. In preparing the roll an egg may be added for each pound and a half of meat, and chopped parsley, onion juice, lemon peel, or finely chopped green peppers make good seasoning. A thickened gravy may be made from the drippings, the liquid used being either water or tomato juice.

Strips of pork laid on the roll may be substituted for the buttered paper and basting.

Filipino Beef.

1 pound round beef.
½ pound lean fresh pork.
1 small onion.
1 green pepper.
1 teaspoonful of salt.
1 cup of soft stale bread crumbs.
1 egg.
2 cups of stewed tomatoes.
2 slices of bacon.
2 tablespoonfuls of butter.
4 tablespoonfuls of flour.

Remove the seeds from the pepper and put it through the meat grinder with the meats and the onion. Add crumbs, egg, and salt. Make into a roll, place in a shallow baking dish, pour the strained tomatoes around it, put the bacon on top, and bake forty minutes, basting with the tomatoes. Thicken the gravy with the flour cooked in the butter. A little seasoning such as a bit of bay leaf, a clove, and a small piece of onion improves the tomato sauce. As the pepper and onion are not likely to be cooked as soon as the meat, it is well to fry them in a little fat before adding to the other ingredients.

This dish will serve 6 to 8 people. When the meat is 20 cents a pound and every other item is valued at usual town market prices, the dish costs about 50 cents. If the meat costs only 10 cents per pound and vegetables from the garden are used the initial cost of the dish will be small. Since no vegetable except potatoes or rice need be served with this dish, it may be said to answer the purpose of both meat and vegetable.

Mock Rabbit.

{ ½ pound round steak, and
{ 1 pound sausage;
or
{ 1 pound round steak, and
{ ½ pound sausage meat.
3 slices of bread moistened with water.
1 egg.
1 onion.
¼ pound salt pork.
Pepper and salt.

Chop the meat. Chop the onion and cook (but do not brown) it in the fat tried out of a small portion of the pork. Add the bread and cook

a few minutes. When this is cool, mix all the ingredients and form into a long round roll. The surface can easily be made smooth if the hand is wet with cold water. Lay the remaining pork cut in thin slices on top and bake forty minutes in a hot oven. The sausage may be omitted if desired and other seasoning used.

Veal Loaf.

3 pounds veal.
1 pound salt pork.
6 soda crackers rolled fine.
3 eggs well beaten.
¼ teaspoonful pepper.
½ teaspoonful salt.

Chop the meat mixed with the other ingredients, shape, and bake three hours, basting occasionally with pork fat. Use one-fourth cut of fat for this purpose. If the roll is pierced occasionally the fat will penetrate more effectually. Veal loaf may also be cooked in bread pans. Some persons cook the veal before chopping.

DEVELOPING AND IMPROVING FLAVOR OF MEAT.

The typical meat flavors are very palatable to most persons, even when they are constantly tasted, and consequently the better cuts of meat in which they are well developed can be cooked and served without attention being paid especially to flavor. Careful cooking aids in developing the natural flavor of some of the cheaper cuts, and such a result is to be sought wherever it is possible. Browning also brings out flavors agreeable to most palates. Aside from these two ways of increasing the flavor of the meat itself there are countless ways of adding flavor to otherwise rather tasteless meats. The flavors may be added in preparing the meat for cooking, as in various seasoned dishes already described, or they may be supplied to cooked meat in the form of sauces.

RETAINING NATURAL FLAVOR.

As has already been pointed out, it is extremely difficult to retain the flavor-giving extractives in a piece of meat so tough as to require prolonged cooking. It is sometimes partially accomplished by first searing the exterior of the meat and thus preventing the escape of the juices. Another device, illustrated by the following recipe, is to let them escape into the gravy which is served with the meat itself. A similar principle is applied when roasts are basted with their own juice.

Round Steak on Biscuits.

Cut round steak into pieces about one-half inch square, cover with water and cook it at a temperature just below the boiling point until it is tender, or boil for five minutes, and while still hot put into the fireless cooker and leave it for five hours. Thicken the gravy with flour mixed with water, allowing 2 level tablespoonfuls to a cup of water. Pour the meat and gravy over split baking-powder biscuits so baked that they have a large amount of crust.

FLAVOR OF BROWNED MEAT OR FAT.

Next to the unchanged flavor of the meat itself comes the flavor which is secured by browning the meat with fat. The outside slices of roast meat have this browned flavor in marked degree. Except in the case of roasts, browning for flavor is usually accomplished by heating the meat in a frying pan in fat which has been fried out of pork or in suet or butter. Care should be taken that the fat is not scorched. The chief reason for the bad opinion in which fried food is held by many is that it almost always means eating burned fat. When fat is heated too high it splits up into fatty acids and glycerin, and from the glycerin is formed a substance (acrolein) which has a very irritating effect upon the mucous membrane. All will recall that the fumes of scorched fat make the eyes water. It is not surprising that such a substance, if taken into the stomach, should cause digestive disturbance. Fat in itself is a very valuable food, and the objection to fried foods because they may be fat seems illogical. If they supply burned fat there is a good reason for suspicion. Many housekeepers cook bacon in the oven on a wire broiler over a pan and believe it more wholesome than fried bacon. The reason, of course, is that thus cooked in the oven there is less chance for the bacon becoming impregnated with burned fat. Where fried salt pork is much used good cooks know that it must not be cooked over a very hot fire, even if they have never heard of the chemistry of burned fat. The recipe for bean-pot roast and other similar recipes may be varied by browning the meat or part of it before covering with water. This results in keeping some of the natural flavor within the meat itself and allowing less to go into the gravy. The flavor of veal can be very greatly improved in this way.

The following old-fashioned dishes made with pork owe their savoriness chiefly to the flavor of browned fat or meat:

Salt Pork with Milk Gravy.

Cut salt or cured pork into thin slices. If very salt, cover with hot water and allow it to stand for ten minutes. Score the rind of the slices and fry slowly until they are a golden brown Make a milk gravy by heating flour in the fat that has been tried out, allowing 2 tablespoonfuls of fat and 2 tablespoonfuls of flour to each cup of milk. This is a good way to use skim milk, which is as rich in protein as whole milk. The pork and milk gravy served with boiled or baked potatoes makes a cheap and simple meal, but one that most people like very much. Bacon is often used in place of salt pork in making this dish.

Fried Salt Pork with Salt Codfish or "Salt-fish Dinner."

½ pound salt pork.
1 pound codfish.
2 cups of milk (skim milk will do).
4 tablespoonfuls flour.
A speck of salt.

Cut the codfish into strips, soak in lukewarm water and then cook in water until tender but do not allow the water to come to the boiling point except for a very short time as prolonged boiling may make it tough.

Cut the pork into one-fourth inch slices and cut several gashes in each piece. Fry very slowly until golden brown, and remove, pouring off the fat. Out of 4 tablespoonfuls of the fat, the flour, and the milk make a white sauce. Dish up the codfish with pieces of pork around it and serve with boiled potatoes and beets. Some persons serve the pork, and the fat from it, in a gravy boat so it can be added as relished.

FLAVORING VEGETABLES, HERBS, SPICES, ETC.

Many flavorings are used in meat dishes, some of which are familiar to all cooks—onions, carrots, turnips, and garlic being perhaps the most widely known. Butter, too, may be regarded as one of the most common seasonings, and of course makes the dish richer. Meat extract is also used for flavoring many meat dishes and other foods, as are also, though less commonly, similar extracts made from clams or other "sea foods." The following list includes these with various others, a number of which it is convenient to keep always on hand: Onions, carrots, green peppers, parsnips, turnips, tomatoes, fresh, canned or dried; celery tops and parsley, either fresh or dried; sage, savory, thyme, sweet marjoram, bay leaf, garlic, lemon rind, vinegar, capers, pickles, olives, currant jelly, curry powder, cloves, pepper corns, celery seed, meat extract, Chili sauce, pepper sauce, or some similar hot or sharp sauce, and some kind of good commercial meat sauce. Some hints regarding the use of such flavorings follow:

Flavor of fried vegetables.—Most of the stews, soups, braised meats, and pot roasts are very much improved if the flavoring vegetables which they contain, such as carrots, turnips, onions, celery, or green peppers, are fried in a little fat before being cooked with the meat. This need not complicate the preparation of the meat or increase the number of utensils used, for the meat itself is usually seared over in fat, and the vegetables can be cooked in the same fat before the browning of the meat.

Onion juice.—Cookbooks usually say that onion juice should be extracted by cutting an onion in two and rubbing the cut surface against a grater. Considering how hard it is to wash a grater, this method has its drawbacks. Small amounts of juice may be obtained in the following simpler way: Peel the onion and extract a few drops of juice by pressing one side with a dull edge of a knife.

Green peppers.—The flavor of green peppers gives an acceptable variety. The seed should always be removed. The peppers should be chopped and added to chopped meat or other meat dishes. Meat mixed with bread crumbs may be baked in the pepper shells and the stuffed peppers served as a separate dish.

Parsley.—It is easy to raise parsley by growing it in a pot in the kitchen window and thus to have it always on hand fresh, or the leaves may be kept for a long time if sealed up in a fruit jar and stored in a cool place. Parsley, mint, and celery tops may all be dried, rubbed into fine bits, and kept in air-tight jars. Recipes usually say to chop fresh parsley with a sharp knife on a board. But a board is a hard thing to wash and a plate serves the purpose quite as well.

Bay leaf.—Bay leaf is one of the best and at the same time one of the most-abused flavors. In small quantities it gives a very pleasant flavor to soups and gravies, but in large quantities it gives a rank resin-like taste. Remember that half of a bay leaf is the allowance for 3 quarts

of soup stock. This will indicate how small a quantity should be used for a portion of gravy usually served at a meal. With this precaution in mind, bay leaf may be recommended as a flavoring for many sauces, particularly tomato sauce.

A kitchen bouquet.—A "bouquet" such as is often referred to in recipes may be made as follows: A sprig each of parsley, savory and thyme, one small leaf of sage, and a bay leaf. This will flavor 1 gallon of soup when cooked in it for an hour and should not remain in it longer.

Horse-radish.—Horse-radish, like mustard, is more often served with meat than used to flavor it during cooking. A very palatable sauce, especially good with boiled beef, is made by adding grated horse-radish and a little vinegar to a little whipped cream, or as follows: Thicken milk with cracker crumbs by heating them together in a double boiler, using 3 tablespoonfuls of cracker crumbs to 1½ cups of milk. Add ⅓ of a cup of grated horseradish, 3 tablespoonfuls of butter and ½ teaspoonful of salt; or thicken with butter and flour some of the water in which the meat was boiled, add a generous quantity (1 or 2 tablespoonfuls) of grated horse-radish, boil a short time, and serve. This recipe is the most usual in German homes where the sauce is a favorite.

Acid flavoring.—Vinegar, lemon juice, and sour jelly, like currant, are often used to flavor the thick gravies which are a part of meat stew or which are served with it. Vinegar is an old-fashioned relish which was often added to bacon or salt pork and greens, pork and beans, corned beef and cabbage, and similar dishes. These flavors combine well with that of brown flour, but not with onions or other vegetables of strong flavor. The idea that vinegar used in small quantities is unwholesome seems to be without foundation.

Pickles.—Chopped pickles are sometimes added to the gravy served with boiled mutton. They are cheaper than capers and serve somewhat the same purpose. Chopped pickles are also very commonly used in sauces for fish and in many others to give a distinctive flavor.

Olives.—Chopped olives also make a welcome variety in meat sauce, and are not expensive if they are bought in bulk. They will not spoil if a little olive oil is poured on the top of the liquor in which they are kept. This liquor should always completely cover them.

Chili sauce, commercial meat sauces, etc.—Recipes often may be varied by the addition of a little Chili sauce, tomato catsup, or a commercial meat sauce. These may be called emergency flavors and used when it is not convenient to prepare other kinds of gravies.

Sausage.—A little sausage or chopped ham may be used in chopped beef.

Curry powder.—This mixture of spices which apparently originated in India, but which is now a common commercial product everywhere, is a favorite flavoring for veal, lamb, or poultry. The precaution mentioned in connection with bay leaves, however, should be observed. A small amount gives a good flavor. It is usually used to season the thick sauces with which meats are served or in which they are allowed to simmer. While the term "curry" is usually employed to describe a particular mixture of spices made up for the trade, it has another meaning. The words "curry" or "curried" are sometimes used to describe highly seasoned dishes of meat, eggs, or vegetables prepared by methods that have come from India or other parts of the East.

India Curry.

1½ pounds veal.
½ cup of butter or drippings.
2 onions or less.
½ tablespoonful curry or less.

Brown meat either without fat or with very little and cut into small pieces.

Fry the onions in the butter, remove them, add the meat and curry

powder. Cover the meat with boiling water and cook until tender. Serve with a border of rice. This dish is so savory that it can be made to go a long way by serving with a large amount of rice. The two onions and one-half tablespoonful of curry powder are the largest amount to be used. Many persons prefer less of each.

In preparing the rice for this dish perhaps no better method can be given than that in an earlier bulletin of this series.

"Wash 1 cupful of rice in several waters, rubbing the grains between the hands to remove all the dirt. Put the washed rice in a stewpan with 2½ cupfuls of water and 1 teaspoonful of salt. Cover and place where the water will boil. Cook for twenty minutes, being careful not to let it burn. At the end of this time put the stewpan on a tripod or ring and cover the rice with a fold of cheese cloth. Let it continue to cook in this manner an hour, then turn into a hot vegetable dish. The rice will be tender, dry and sweet, and each grain will separate. During the whole process of cooking the rice must not be stirred. If a tablespoonful of butter is cut up and scattered over the rice when it has cooked twenty minutes the dish will be very much improved."

The butter is not necessary when the rice is served with India curry but may be included in dishes where less fat is used.

Curry of Veal.

2 tablespoonfuls butter or drippings.
1½ pounds veal.
½ onion, chopped.
1 pint milk.
1 tablespoonful flour.
1 teaspoonful curry powder.
Salt and pepper.

Fry the onions in the butter or drippings, remove, and fry the veal until it is brown. Transfer the meat to the double boiler, cover with milk and cook until the meat is tender. Add the curry powder a short time before the meat is done and thicken the milk with flour before serving.

SAUCES.

The art of preparing savory gravies and sauces is more important in connection with the serving of the cheaper meats than in connection with the cooking of the more expensive.

There are a few general principles underlying the making of all sauces or gravies, whether the liquid used is water, milk, stock, tomato juice, or some combination of these. For ordinary gravy 2 level tablespoonfuls of flour or 1½ tablespoonfuls of cornstarch or arrowroot is sufficient to thicken a cupful of liquid. This is true excepting when the flour is browned. In this case about one-half tablespoonful more should be allowed, for browned flour does not thicken so well as unbrowned. The fat used may be butter or the drippings from the meat, the allowance being 2 tablespoonfuls to a cup of liquid.

The easiest way to mix the ingredients is to heat the fat, add the flour, and cook until the mixture ceases to bubble, and then to add the liquid. This is a quick method and by using it there is little danger of getting a lumpy gravy. Many persons, however, think it is not a wholesome method and prefer the old-fashioned one of thickening the gravy by means of flour mixed with a little cold water. The latter method is of course not practicable for brown gravies.

Considering the large amount of discussion about the digestibility of fried food and of gravies made by heating flour in fat, a few words on the subject at this point may not be out of order. It is difficult to see how heating the fat before adding the flour can be unwholesome, unless the cook is unskillful enough to heat the fat so high that it begins to scorch. Overheated fat, as has already been pointed out, contains an acrid irritating substance called "aerolein," which may be readily considered to be unwholesome. It is without doubt the production of this body by overheating which has given fried food its bad name. Several ways of varying the flavor of gravies and sauces were suggested in the preceding section. One other should be especially mentioned here.

The flavor of browned flour.—The good flavor of browned flour is often overlooked. If flour is cooked in fact until it is a dark brown color a distinctive and very agreeable flavor is obtained. This flavor combines very well with that of currant jelly, and a little jelly added to a brown gravy is a great improvement. The flavor of this should not be combined with that of onions or other highly flavored vegetables. A recipe for a dish which is made with brown sauce follows.

Mock Venison.

Cut cold mutton into thin slices and heat in a brown sauce made according to the following proportions:

2 tablespoonfuls butter.
2 tablespoonfuls flour.
1 tablespoonful of bottled meat sauce (whichever is preferred).
1 tablespoonful red-currant jelly.
1 cupful water or stock.

Brown the flour in the butter, add the water or stock slowly, and keep stirring. Then add the jelly and meat sauce and let the mixture boil up well.

* * * * * * *

Meat is in general one of the most digestible of food materials. Recent experiments indicate that all kinds are thoroughly digested, less expensive cuts as well as the more costly. The higher priced cuts contain more of the so-called extractives or extractives of more pleasing quality, and it is these substances which not only give the meat its agreeable flavor, but also actually stimulate the digestive processes. They have, however, little if any nutritive value, and for persons with normal digestion the less expensive cuts, even if less rich in extractives, cooked and flavored in an appetizing way, may certainly be used to replace the more costly cuts.

Meat is undeniably one of the more expensive items in the food bill of the ordinary family, and for this reason it is important that it be bought and used to the best possible advantage. In rural communities co-operative slaughter-houses and storage houses are often useful not only in reducing the cost of meat, but in making fresh meat available in summer. If the size of her family or her storage facilities warrant, the housekeeper may find it advantageous to buy

the whole carcass of a small animal, such as a pig or a lamb, or a large section of beef, thus securing better prices. Carefully following the market and taking advantage of any special opportunity that may offer also helps to reduce the expense for meat for the family in town.

It is also important to reduce waste by using as much as possible of the bone, fat, and trimmings, not usually served with the meat itself. If nothing better can be done with them, the bones and trimmings can almost always be profitably used in the soup kettle and the fat can be saved for cooking, thus saving the more expensive butter and lard. The bits of meat not served with the main dish or remaining after the first serving can be seasoned and recooked in many palatable ways, or can be combined with vegetables, pie crust, or other materials, and thus the meat flavor may be extended over a large quantity of less expensive food with such combinations. Moreover, smaller quantities of meat can often be bought than would be necessary were the meat served alone.

Different kinds and cuts of meat vary considerably in price. Sometimes the cheaper cuts contain a larger proportion of refuse than the more expensive, and the apparent cost is less than the actual cost of the edible portion. Aside from this the advantage of the more expensive cuts lies in tenderness and flavor rather than in nutritive value. Tenderness depends on the character of the muscle fibers and connective tissues of which the meat is composed. Flavor depends partly on the fat present in the tissues, but mainly on nitrogenous bodies known as extractives, which are usually more abundant or of more agreeable flavor in the more tender parts of the animal. The heat of cooking dissolves the connective tissues of tough meat and in a measure makes it more tender, but heat above the boiling point or even a little lower tends to change the texture of muscle fibers. Hence tough meats must be carefully cooked in low heat long applied in order to soften the connective tissue without unduly changing the fibers. Cooking, especially in water, presents a further danger, namely, the escape into the water of the nutritious material in the meat. In cases where the liquid in which the meat is cooked is to be used, as in soups and some stews, this is of less importance or it may even be an advantage, but where the meat only is to be used the fact must always be taken into consideration. Not only is the amount of nutritive material in the meat lessened, but the extractives are lost and with them more or less of the flavor the meat originally possessed. To lessen the chances of loss, cooks frequently sear the exterior of the meat either in hot fat or in boiling water before beginning the long cooking, or tough meat may be pounded or chopped to break down the tissues to a certain extent, and thus permit shorter cooking. Besides using such devices to retain and develop the natural flavor of the meat, other flavors may be added to supplement them. These may be put into the meat before cooking or may be added later in the form of relish or sauce.

Vegetables of distinctive flavor such as onions, carrots, or celery; savory herbs such as parsley, sage, bay leaf, or thyme; and materials such as vinegar, pickles, or currant jelly; spices such as pepper, cloves, or "curry" mixtures; and sharp or highly seasoned meat sauces are all types of flavoring materials which are useful for such purposes and which may be used in a great variety of ways.

In fact the number of "tasty" dishes which a good cook can make out of the cheaper cuts of meat or meat "left over" is almost endless. Undoubtedly more time and skill are required in their preparation than in the simple cooking of the more expensive cuts, just as more time and skill are required for careful, intelligent marketing than for haphazard ordering; but the real superiority of a good cook lies not so much in the preparation of expensive or fancy dishes as in the attractive preparation of inexpensive dishes for every day and in the skillful combination of flavors.

—*Extract, Farmers Bulletin 391.*

General Rules for Vegetables

Wash thoroughly, pare and scrape, if skins must be removed. Keep in cold water until cooked, to keep them crisp and to prevent their being discolored. Cook in boiling water; the water must be kept at the boiling point. Use 2 t. salt with 2 qts. water; put the salt into the water when the vegetables are tender. The water in which vegetables are cooked is called vegetable stock.

Fresh green vegetables require less water than others.

Cabbage, cauliflower, onions and turnips should be cooked uncovered in a large amount of water.

All vegetables must be drained as soon as tender. Season with salt and pepper and serve hot with butter or sauce.

Cold vegetables may be used for salads, or may be placed in a baking dish with one-half the quantity of sauce (2 c. vegetables and 1 c. sauce) covered with buttered crumbs, and browned in a hot oven.

BOILED CABBAGE.

Trim off the limp outside leaves of a cabbage; cut into eight pieces, or if it must be cooked quickly, shave into smaller pieces. Put it into a kettle filled with boiling water and cook until tender. Do not cover the kettle, and there will be very little of the cabbage odor in the house. A young cabbage requires about 40 m. to cook—20m. if shaved.

When the cabbage is done drain the water off and season.

WHITE SAUCE.

2 T. butter,
2 T. flour,
½ t. salt,
¼ ssp. pepper.
1 c. milk.

Melt the butter in a sauce pan, add flour and seasonings and when bubbling, add the milk, stir constantly until the mixture thickens.

Keep hot over boiling water.

In making a large quantity of sauce scald the milk to save time.

BROWN SAUCE.

2 T. butter,
2½ T. flour,
½ t. salt,
¼ ssp. pepper.
1 c. milk.

Brown the butter and flour together and proceed as in white sauce.

CREAMED TURNIPS.

Wash and pare turnips and cut little one-half inch cubes. Cook three cups of turnips in boiling water about twenty minutes or until tender. Drain and add one cup of white sauce.

CARROTS WITH BROWN SAUCE.

To prepare carrots for cooking, wash and scrape, as best flavor and brightest color are near the skin. Cut into cubes and cook in boiling water about twenty minutes or until tender. Drain and add brown sauce, using one cup of sauce to one cup of vegetables.

N. B.—2 T. flour will thicken 1 c. liquid.

TIME TABLE FOR COOKING VEGETABLES

Potatoes, white.....20 to 30 m.	Parsnips .....15 to 45 m.
Potatoes, sweet.....15 to 25 m.	Green Corn.....12 to 20 m.
Asparagus .....½ to 1 hr.	Cauliflower .....20 to 25 m.
String beans.....30 m. to 2 hr.	Tomatoes .....15 to 20 m.
Beets .....45 m. to 3 hr.	*Boiled rice.....30 m.
Cabbage .....20 to 40 m.	*Steamed rice.....40 to 50 m.
Turnips .....30 to 40 m.	*Macaroni .....30 to 40 m.
Onions .....30 to 60 m.	Dried Lima Beans.....1 hr.
Kohlrabi .....30 to 40 m.	Young Lima Beans....25 to 30 m.

*Served same as vegetables.

DAINTY WAY TO SERVE CABBAGE.

Cut out the heart stem and core of a medium sized cabbage, and remove the outer leaves. Plunge the head into an abundance of boiling water for four minutes, and take it up very carefully, so as not to break it. Let it cool. Prepare a force meat, using a pound of sausage with a quarter of a pound of lean veal ground to a pulp and seasoned to taste. Stuff the inside of the head, and tie it up carefully, so that the stuffing will not come out. Put into a pan with a small carrot, a small onion, and a cupful of stock or milk. Let it simmer in the oven or on top of the stove, well covered. Baste occasionally and serve with rich brown sauce.

Weights and Measures for a Cook

By James H. Hubbard.

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1 pound wheat flour is equal to 1 quart.
1 pound and 2 ounces of Indian meal make 1 quart.
1 pound of soft butter is equal to 1 quart.
1 pound and 2 ounces of brown sugar make 1 quart.
1 pound and 1 ounce of powdered sugar make 1 quart.
1 pound of broken loaf sugar is equal to one quart.
8 large tablespoonfuls make 1 gill.
1 common sized tumbler holds 1 pint.
1 teacup holds 1 gill.
1 large size wine glass holds 2 ounces.
1 tablespoonful is equal to ½ ounce.

TIME TABLE FOR BAKING

Beans (if prepared by soaking and boiling) 3 to 4 hours.
Beef sirloin or rib, rare, weight 5 pounds, 1 hour 5 minutes.
Beef sirloin or rib, well done, weight 5 pounds, 1 hour 40 minutes.
Beef rump, rare, weight 10 pounds, 1 hour 35 minutes.
Biscuits, raised, 12 to 20 minutes.
Biscuits, baking powder, 12 to 15 minutes.
Bread, white, loaf, 45 to 60 minutes.
Bread, graham, loaf, 35 to 45 minutes.
Cake, layer, 15 to 25 minutes.
Cake, loaf, 40 to 60 minutes.
Cake, sponge, 45 to 60 minutes.
Chicken, 3 to 4 pounds, 1½ to 2 hours.
Cookies, 6 to 10 minutes.
Custard (baked in cups), 20 to 25 minutes.
Duck (domestic), 1 to 1½ hours.
Duck (wild), 20 to 30 minutes.
Fish (thick), 3 to 4 pounds, 45 to 60 minutes.
Fish (small), 20 to 30 minutes.
Gingerbread, 25 to 35 minutes.
Leg of Lamb, well done, 1½ to 2 hours.
Mutton, 1½ to 2 hours.
Pork, well done, 4 pounds, 2 hours.
Potatoes, 35 to 50 minutes.
Puddings, rice or bread, 45 to 60 minutes.
Veal Leg, well done, per pound, 20 minutes.

Sandwiches

The most important item of the lunch basket is the sandwiches, the names and ingredients of which are numberless.

Success is not so much in the ingredients as in the making. The bread should be at least 24 hours old. Carefully trim the loaf on all sides. Placing it lengthwise on the table, butter with previously creamed butter necessary to make it spread evenly. Cut the slices lengthwise of the loaf, thus avoiding crumbs. The most economical shapes are strips, squares and triangles, but fancy shapes may be made with cookie cutters. All kinds of bread may be used alone or in combination. Variety may be given by adding very finely chopped chives, onions, pickles, olives, mint or parsley, to be creamed with butter. Never use a very moist filling for sandwiches that are to be kept any length of time.

RIBBON SANDWICHES.

Take three square thin slices of white bread and two corresponding slices of whole wheat bread. Butter a slice of white and cover it with a filling made of egg paste, then put upon it a slice of whole wheat bread and butter that and cover with egg paste.

On top of that place another slice of white bread and repeat the operation with white bread and whole wheat bread, alternating until you have used all your five slices.

With a sharp knife cut the whole into narrow strips and your sandwiches are ready.

First in point of keeping quality are the ham, chicken and tongue sandwiches.

Next comes the cheese and nut combination, then those containing sweets.

Never use a filling containing salad dressing unless the sandwiches are to be used at once.

When sandwiches are made in quantity and kept for several hours, they should be covered with a damp cloth which should then be covered with a dry one.

PASTRY AND SWEETS.

Next in importance is the selection of pastry and sweets. Individual pies and patties should be used in preference to the larger ones, and these should be carefully wrapped in paraffine paper and packed in a box.

OTHER ACCESSORIES.

Olives, pickles, etc., are carried in original packages. Candy and bon bons in small boxes. Eggs are well cooked, seasoned and each wrapped in paraffine paper. Ripe fruit is very acceptable and easily carried, but avoid fruits with strong odor like pineapple and bananas.

Salads and Salad Dressings

All green salads should be chilled before serving that they may be crisp. Add dressing to green salads just before using; if put on sooner it softens the leaves and spoils both taste and appearance. The salad bowl may be rubbed with a cut onion or a few drops of onion juice (obtained by rubbing a cut onion on grater) can be added to salad.

In preparing salads from meat and fish an almost endless variety of flavors can be obtained by a careful blending of seasonings to suit the principal ingredients of the salad itself. Few better salads can be eaten than those made from fragments of cold roast lamb cut into dice, mixed with a cup of cooked peas and a little finely chopped mint. If the lamb be boiled, substitute a few chopped capers for the mint; with cold pork, have a sprinkling of sage and an equal quantity of diced celery; with fish, plenty of lemon juice and cucumber.

These salads are all served with a dressing, either French, boiled or mayonnaise, as best suits the salad and the convenience of the maker.

Fruit salads are frequently served at luncheon—sometimes as a first course.

RULES FOR SALAD MAKING.

1. All salads are likely to be dry, as well as those having no dominating flavor, are better if they are marinated with a French dressing sometime before serving in addition to the dressing added at table.

2. It is not enough to wash the salad plants; they must be dried also, for the water dripping from the leaves in the serving dish would thin the dressing and make it insiped.

3. A good portion of the dressing must be mixed with the salad, not all poured over the top.

POTATO AND EGG SALAD.

3 eggs,
3 medium sized potatoes,
Salt and pepper to taste,
French dressing,

Cook the eggs hard, remove shells and finely chop, and to prevent eggs being discolored, use a silver knife. Cook potatoes and chop finely and add eggs and mayonnaise and let stand one hour on ice to chill; serve on lettuce leaf.

MAYONNAISE DRESSING.

1 egg yolk,
½ pint olive oil,
¼ teaspoonful paprika or white pepper,
4 tablespoonfuls lemon juice or vinegar,
½ teaspoonful salt.

Break the yolk of the egg into a dry cold bowl and beat a little. At first add the oil to the egg very slowly (a few drops at a time) and

as the dressing begins to thicken, the oil may be added more rapidly till, at the last, a teaspoonful at a time may be stirred in. The dressing must be stirred while the oil is being added, either with a spoon, fork or wire egg beater. Add the vinegar slowly, continuing the beating while it is being mixed. It is better not to add the salt and pepper till the mayonnaise is to be used, because it keeps better if the seasoning is omitted. In any case, even when the dressing is to be used at once, do not add the seasoning till the oil and vinegar, or lemon, are added to the egg.

Tarragon or other flavored vinegars such as mint, may be substituted, in whole or in part, for the plain vinegar or lemon juice. Keep mayonnaise in a cool, dark place.

FRENCH DRESSING.

4 tablespoonfuls olive oil.
1 ½ tablespoonful vinegar.
⅓ teaspoonful salt.
¼ teaspoonful paprika or pepper.
1 teaspoonful mixed mustard, if liked.

Mix the salt and pepper in a shallow dish or saucer; add the mustard, if it is to be used, and pour in the oil. Stir well to mix with the seasonings and add the vinegar, a little at a time, beating the mixture with a fork, continuously. Serve as soon as mixed.

BOILED SALAD DRESSING.

2 tablespoons butter.
2 eggs.
1 cup vinegar.
½ teaspoonful pepper.
2 tablespoonfuls sugar.
1 teaspoonful dry mustard.
⅔ teaspoonful salt.
2 T. cream.

Put the butter, sugar, eggs, mustard, salt and pepper into a bowl or the inner part of a double boiler and cook over hot water until they begin to thicken. Add the vinegar and continue the cooking three minutes. Beat the mixture occasionally while cooling. Keep in a cool, dark place. This dressing will remain good several weeks.

Freezing

General Rules.

The can, cover and dasher of the freezer should be scalded and then chilled before the mixture which is to be frozen is placed in it. Adjust the can carefully in the tub before packing. Pour in the mixture, put in the dasher, cover, adjust the crank and pack with finely chopped ice and rock salt; this must be higher around the can than the mixture is on the inside.

Use three times as much ice as salt for freezing; use four times as much ice as salt in packing.

In freezing ice cream the crank should be turned slowly and steadily; in freezing sherbet the crank should be turned rapidly and steadily; in freezing water ice, or frozen fruit, turn the crank steadily 5 m., allow it to stand 5 m., turn again 5 m., and continue until freezing is completed.

When the mixture is frozen, remove ice and salt from around the top of the can; wipe cover and top, uncover and remove dasher, scrape it; place paraffine paper or heavy paper over can; cover and put a cork in the hole. Repack the freezer, putting ice and salt over the top, cover with a carpet, blanket or newspaper, or pack in fireless cooker, and allow it to stand in a cold place several hours.

A tightly covered tin can and a wooden pail may be substituted for an ice cream freezer, using a wooden spoon or paddle to scrape the mixture from the sides and bottom of the can as it freezes.

In preparing frozen fruit or water ice the sugar and water should be made into syrup, which should be boiled 5 m., then strained; in preparing ice cream with fruit, the sugar and crushed fruit should stand 1 hr. in a cool place, or until the sugar is dissolved, then add cream and freeze; in preparing ice creams without fruit, the cream should be scalded and the sugar dissolved in it, cool, add flavoring and freeze.

Fruit juice is used for water ice; the fruit is pressed through a colander or cut in small pieces with a silver knife for frozen fruit; either juice or crushed fruit may be used for ice cream; it is preferable to use only the juice of very seedy fruits.

Ice Cream

General Rules

The can, cover and dasher of the freezer should be scalded and then chilled before the mixture which is to be frozen is placed in it. Adjust the can carefully in the tub before packing. Pour in the mixture, put in the dasher, cover, adjust the crank and pack with finely chopped ice and rock salt; this must be higher around the can than the mixture is on the inside.

Use three times as much ice as salt for freezing; use four times as much ice as salt in packing.

In freezing ice cream the crank should be turned slowly and steadily; in freezing sherbet the crank should be turned rapidly and steadily; in freezing water ice or frozen fruit, turn the crank steadily 5 m., allow to stand 5 m., turn again 5 m., and continue until freezing is completed.

When mixture is frozen, remove ice and salt from around the top of the can; wipe the cover and top, uncover and remove dasher, scrape it; then beat frozen mixture with wooden spoon or paddle; place paraffine paper or heavy paper over can; cover and put a cork in the hole. Repack the freezer, putting ice and salt over the top, cover with a carpet, blanket or newspaper, and allow it to stand in a cold place several hours.

A tightly covered tin can and a wooden pail may be substituted for an ice cream freezer, using a wooden spoon or paddle to scrape the mixture from the sides and bottom of the can as it freezes.

In preparing frozen fruit or water ice the sugar and water should be made into a syrup, which should be boiled 5 m., then strained; in preparing ice cream with fruit, the sugar and crushed fruit should stand 1 hr. in a cool place, or until the sugar is dissolved, then add cream and freeze; in preparing ice creams without fruit the cream should be scalded and the sugar dissolved in it, cool, add flavoring and freeze.

Fruit juice is used for water ice; the fruit is pressed through a colander or cut in small pieces with a silver knife for frozen fruit; either juice or crushed fruit may be used for ice cream; it is preferable to use only the juice of very seedy fruits.

VANILLA ICE CREAM, No. 1.

1 qt. cream,
1 or 2 c. milk,
1 c. sugar,
2 t. vanilla.

VANILLA ICE CREAM, No. 2

2 c. scalded milk,
1 egg,
⅛ t. salt,
1 T. flour,
1 c. sugar,
1 qt. thin cream,
2 t. vanilla.

Mix flour, sugar and salt; add egg slightly beaten, and milk, gradually. Cook over hot water 20 m., stirring constantly at first. When cool, add flavoring and cream; strain and freeze.

CHOCOLATE ICE CREAM.

Add 2 oz. of bitter chocolate to vanilla ice cream mixture.

STRAWBERRY ICE CREAM

1 qt. thin cream, a box strawberries.
⅞ c. sugar.

Wash and hull berries. Sprinkle with sugar. Let stand one hour; mash and rub through a strainer. Add the cream and freeze.

MILK SHERBET

½ c. lemon juice, 2 c. sugar,
1 qt. milk.

LEMON ICE

4 c. water, 2 c. sugar,
¾ c. lemon juice.

Make a syrup by boiling water and sugar 20 m., add lemon juice; cool, strain and freeze, same as ice cream.

CRANBERRY FRAPPE

One quart cranberries, two cups water, two cups sugar, juice of two lemons. Cook the berries in the water eight minutes, strain; add sugar and bring to the boiling point. Cool, add lemon juice and freeze to a mush, using equal quantities of salt and ice.

STRAWBERRY ICE

4 c. water, 2 c. strawberry juice,
1½ c. sugar, 1 T. lemon juice.

Make a syrup as for lemon ice; cool, add strawberries crushed and squeezed through a double cheesecloth; add lemon juice; strain and freeze.

GRAPE FRAPPE

4 c. water, 2 c. grape juice,
2 c. sugar, ⅔ c. orange juice,
¼ c. lemon juice.

Make a syrup by boiling water and sugar 15 m.; add grape, lemon and orange juice; cool, strain and freeze to a mush, using equal parts of ice and salt.

The Chemistry of a Cup of Tea

"These statements are made on the authority of the 'Lancet,' which recently published a long article on the chemistry of tea."

There are two substances in tea which give it its flavor and its stimulating effects. These are caffeine and tannin. They may exist in chemical combination or separately. In combination they are caffeine-tannate, which contains one part of caffeine and three of tannin. In this case there is nothing injurious about them, if these two alkaloids are free—that is not in chemical combination—they may be highly injurious, for tannin is one of the most powerful astringents known, and its effect upon meat or any animal substance is to turn it to leather.

A good tea, properly made, yields an infusion in which the caffeine and tannin are properly combined. A bad tea or a good one badly made, may contain an excess of caffeine, in which case it is disagreeably bitter; or an excess of tannin, in which case it acts in a way that prevents digestion.

If tea be boiled or allowed to stand too long a point is reached when the tannin appears in excess. The Lancet shows that a five minutes' infusion of an ordinary Indian tea showed a total tannin content 9.24 per cent and caffeine 3.70 per cent. On infusing the same tea for an hour, the tannin amounted to 16.12 per cent and the caffeine 4.40 per cent. The former was wholesome, the latter pernicious.

No tea should ever be boiled. There is only one proper way to make tea; take fresh water, the instant it boils, pour it upon the leaves in a previously heated pot. Pour off in five minutes, or even less, depending on how strong you like it. After five minutes the tannin begins to come out and the tea becomes injurious.

Chemistry of Coffee

A high grade coffee, perfectly roasted, properly ground, requires twelve ounces to the gallon for morning coffee, while for after dinner coffee, which is generally served en demi-tasse, sixteen ounces to the gallon are required; fresh boiling water the moment it reaches the bubbling point, then only a little at first to open the pores of the coffee and get it ready to receive the remainder, which is to be put on a little at a time until all the good and none of the bitterness (tannin) is extracted, for if it be too strong it can be easily diluted with boiling water when in cups—hot cups first, then the sugar, then warmed (not boiled) milk, then the coffee, and if you can afford it, put on the top a teaspoonful of whipped cream.

Coffee made in a metal vessel forms "tannate of iron" which is the tannin eating the metal, an ink, so to speak, and if let stand over night makes a very fair writing fluid.

BOILED COFFEE.

For 4 heaping tablespoons ground coffee allow 1 quart freshly boiling water and ½ white 1 raw egg. Mix the egg white with 3 tablespoons cold water, beating with fork. Add coffee and stir till well wet. Scald coffee pot, put in prepared coffee. Pour in boiling water, cover spout, and boil 5 minutes. Pour in quickly ¼ cup cold water, let stand 3 minutes to settle. Strain into hot pot or have strainer on table.

COFFEE FOR SIX PERSONS.

Take 1 full cup ground coffee, 1 egg, a little cold water, stir together, add 1 pint boiling water, boil up; then add another pint boiling water, and set back to settle before serving; add speck salt.

FRENCH COFFEE.

One quart water to 1 cup very fine ground coffee. Put coffee grounds in bowl; pour over about ½ pint cold water and let stand 15 minutes; bring remaining water to a boil; take coffee in bowl, strain through fine sieve, then take French coffee pot, put coffee grounds in strainer at top of French pot, leaving water in bowl. Then take boiling water and pour over coffee very slowly. Then set coffee pot on stove 5 minutes; must not boil. Take off and pour in cold water from bowl that coffee was first soaked in to settle. Serve in another pot. The French, who have the reputation of making the best coffee, use 3 parts Java, 1 part Mocha.

VIENNA COFFEE.

Equal parts Mocha and Java Coffee; allow 1 heaping tablespoon of coffee to each person, and two extra to make good strength. Mix one egg with grounds, pour on coffee one-half as much boiling water as will be needed, let coffee froth, then stir down grounds and let boil 5 minutes; then let coffee stand where it will keep hot, but not boil, for 5 or 10 minutes; and add rest of water. To 1 pint cream add white of an egg, well beaten; this is to be put in cups with sugar, and hot coffee added.

COCOA.

The usual rule is, one teaspoon cocoa to each cup. Mix dry cocoa with little cold water, add scalded milk or boiling water, and boil one minute.

Candy

The best and easiest way is to learn thoroughly the four candy stages and then the candy maker will be independent of everything. These stages are: the soft ball stage, used in fondant, fudge and all kinds of cream candies; the hard ball stage, used in caramels; the crack stage, used in taffy, and the caramel, used with glace nuts and fruit and peanut brittle,

Fondant, the basis of dozens of candies is cooked to the soft ball stage and is the hardest of all candies to make. The whole secret is to prevent the syrup sugaring. This may be prevented in several ways. The easiest way is to add a spoonful of glucose or corn syrup to the other ingredients, or a little acid, such as cream of tartar, lemon juice or vinegar may be added, and this will change a small part of the sugar substance like corn syrup and thus make it smoother in texture.

CREAM PASTE.

2 lbs. granulated sugar
2 cupfuls of water,
⅛ lb. of butter,
¼ lb. of glucose,
¼ lb. of nut meats,
½ teaspoonful of vanilla.

When the syrup has been cooked to the soft ball stage, pour it quickly into a large flat pan or bowl and set in a cold place. When cool stir until waxy, then add the nuts and flavoring. Knead until smooth and like dough. Slice or cut in cubes.

FOUR HARDENING STAGES.

The second stage is a hard ball. Candies of this kind usually contain a considerable amount of butter and therefore give no trouble from sugaring off. Care must be exercised not to cook the candy too long and burn it as it only takes a few minutes to pass from the soft ball stage to the hard ball stage. When the spoonful of candy dropped into cold water forms a hard ball which can barely be dented by the thumb and first finger the candy is done.

The third stage is the crack or taffy stage. Acid is used to prevent crystalization. This is a very easy stage to tell. A little of the candy is dropped into cold water and forms long threads which break and snap instead of bending.

The fourth stage, that of caramelization, is easy to tell because there is a slight change in color. If the sugar and water are boiled together and no acid added to prevent sugaring then the same care must

be used to wash down the crystals from one side of the pan as in case of the fondant. Sometimes as in the case of peanut brittle, no water is added and the sugar is melted done. In this case care must be taken to stir it well and not allow part of the sugar to become darker brown than another part.

COOKED TO THE HARD BALL STAGE.
CHOCOLATE CARAMELS.

2 cupfuls of brown sugar
½ cupful milk or cream,
½ cupful molasses
2 to 4 squares of chocolate
½ cupful of butter
1 teaspoonful of vinalla.

COOKED TO THE CRACK STAGE.
SUGAR TAFFY.

3 cupfuls of granulated sugar
1 cupful of boiling water
1 tablespoonful of vinegar,
2 tablespoonfuls of butter,
1 teaspoonful of vanilla
½ teaspoonful of lemon.

Cook the sugar, water, vinegar and butter to the crack stage. Add flavorings and turn into buttered pans. When partly cool, pull and cut into pieces one inch in length.

Food Preservation

Extract from Farmers Bulletin No. 375, U. S. Department of Agriculture.

The preservation of food in the home is a very important part of the housekeeper's responsibility.

Why do foods spoil?

1. Because of living organisms in or on food.

2. Micro Organisms, as mold plant, yeast plant and bacteria, which require warmth, moisture, light, oxygen and food to develop and grow in.

Although yeast plants, mold plants, and bacteria are not perceived by the naked eye (only by aid of microscope) we are all familiar with the products of their growth and activities as they grow everywhere, on ground, in water, and in air.

HOW TO PREVENT FOOD FROM SPOILING.

1. By means of low temperatures.
2. By means of high temperatures.
3. By means of preservatives (chemicals).
4. By means of removal of moisture.

By low temperatures as follows:

(1). Cold storage.
(2). Use of refrigerators.
(3). Ice houses.
(4). Cellars—Conditions to be considered—Ventilation, humidity, temperature.

By high temperatures:

Canning—Intermittent process.

Harmful Preserving Substances

Chemicals: { Borax and Boric Acid; Salicylic-Acid and Salicylates; Benzoatic Acid and Benzoates; Sulphur and Sulphites; Copper—Used in Vegetables, Fruits and Meats.

Harmless Preservatives

{ Sugar
{ Salt
{ Vinegar
{ Spices

Doubtful

{ Saltpetre
{ Smoke

The purpose of using the above preservatives in foods is to save labor and to make it possible to use an inferior grade of material by neutralizing in a degree the presence and ill effects of decomposition and growths of micro-organisms, viz: Mold plants, bacteria and yeasts, which has become contaminated by exposure and unsanitary conditions.

THE PHYSICAL EFFECTS OF PRESERVATIVES. (Chemicals.)

The use of poisonous chemicals in our food is strongly objected to by scientific authority.

Because in the majority of cases they act as a sediment which causes the system undue taxation which falls principally upon the kidneys (filterers of the body), and also because they create disturbances of appetite and digestion.

—*Extract, National Food Magazine.*

Method of Canning by the Intermittent Process

The Intermittent Process is the sterilization by intermittent heat, whose purpose it is to destroy the micro-organisms, both in the spore and vegetable stages.

Fruits and tomatoes require less sterilization because they contain a high content of acidity which adds materially to the destruction of germids.

Only good material should be used (fruits and vegetables).

Coarse grained sugar is preferable as it is more soluble than fine grained sugar.

To be used when sterilization by intermittent heat is necessary, a natural flavor is the object, and a rich, highly sweetened product is not desired:

1. Pack the prepared fruit or vegetable firmly in the can to within one-half inch of top. Care should be taken not to bruise, injure, nor crush soft fruits.
2. Add sugar or salt according to the food canned.
   For vegetables, add ½ to 1 teaspoon salt to each quart of vegetables; if sugar is desired, as in beets and peas, add 1 to 2 teaspoons.
   For each quart can of fruit use:
   To make very sweet, 1 cup, or 8 ounces, of sugar.
   To make moderately sweet, ½ cup, or 4 ounces, of sugar.
   To make slightly sweet, ¼ cup, or 2 ounces, of sugar.
   (Fruits may be canned without any sugar.)
   The sugar may be sprinkled over the fruit after the fruit is placed in the can; but a better method is to make a sirup by cooking the sugar with water for 1 to 2 minutes, using 2½ to 3 cups of water for each quart can of fruit.
3. For vegetables, fill the can, packed as directed, completely full of clean, cold water. For fruits, if the sugar has been sprinkled over the fruit, fill the can full of clean, cold water; if the sugar has been made into a sirup, fill the can completely full of sirup.
4. Place a new rubber on the can and adjust the top of the can, but **do not seal it.**
5. Place cans on slats of wood or other perforated support in the bottom of the boiler or cooking vessel.
6. Pour enough cold water into the vessel to cover the jars to a depth of two to three inches.
7. Bring the water to the boiling point and boil 5 to 20 minutes, according to the kind of fruit or vegetable, then seal the can.
8. After the cans are sealed, boil 10 to 45 minutes, according to the kind of food canned.
9. Remove cans from the vessel, set them aside out of any draught, and let them cool. Let them stand 24 hours in a warm room.
10. On the second day, return the cans to the boiler, prepared as previously directed with perforated rack and water, and, without loosening the seal of the can, bring the water to the boiling point and boil 5 to 60 minutes, according to the food to be cooked.
11. Remove cans from the boiler, cool, and let stand as before.
12. On the third day, cook as on the previous day, 10 to 60 minutes, according to the food to be prepared.
13. Remove from the boiler, cool, wash outside of can thoroughly, label, and set away.

TABLE OF DIRECTIONS FOR CANNING FOOD

Food	Special preparation before canning	Time of cooking (minutes)		
		Before sealing	After sealing	Second and third days
Apples	Peel, quarter, and core	10	15	25
Blackberries	Remove stem, leaves, trash, nad imperfect berries	5	5	10
Cherries	Seed or leave whole	10	10	20
Grapes	Pick from stem	10	10	20
Huckleberries	Remove leaves, trash, and imperfect berries	5	10	15
Plums	Leave whole or cut in halves	10	10	20
Peaches	Peel, can whole, in halves, or in quarters	10	10	20
Pears	Peel, cut in halves or quarters, and core	10	15	25
Quinces	Peel, quarter, and core	10	20	30
Raspberries	Remove stems	5	5	10
Rhubarb	Cut in 1½-inch pieces	10	10	20
Strawberries	Stem	5	5	10
Asparagus*	Cut in lengths to fit jar, parboil 5 minutes, and drain	15	45	60
Beets*	Boil until skin is easily removed. Can whole, in slices, or in quarters	15	45	60
Beans, Lima*	Hull by hand	15	45	60
Beans, string*	Remove strings, cut into 1-inch pieces. Boil 5 minutes and drain before putting into cans	15	45	60
Corn*	Cut grains from cob and scrape cob, or score grains before cutting from the cob	15	45	60
Eggplant	Cut in thin slices, drop in boiling water, and let stand 15 to 20 minutes. Drain and pack in jar	15	45	60
Peas*	Shell. Boil 5 minutes. Remove wrinkled peas. Put into cans	15	45	60
Pumpkin*	Peel, cut into small blocks	15	45	60
Spinach	Wash free from all sand and grit. Remove discolored leaves. Boil 5 minutes. Drain and pack in jars	10	30	40
Succotash Corn 2-3 Beans 1-3	Prepare corn and beans as directed	15	45	75
Sweet potatoes	Boil until skins will peel off. Cut in convenient sizes to fit cans	15	45	60
Tomatoes	Scald for 5 minutes. Remove skins. Save any juice escaping	10	20	30
Tomato mixture Corn 1-3 Tomatoes 2-3	Prepare each as directed above and mix	15	45	60

* To insure success, those foods that are starred require the three-day cooking, or should be steamed one day only for 2 to 4 hours. The intermittent cooking is not only more likely to be safe, but it will give a better product.

For apples, cherries, grapes, plums, peaches, pears, quinces, raspberries, rhubarb, and tomatoes, a one-day cooking is generally safe; 30 to 40 minutes on the first day, and the second and third-day cooking to be omitted.

—Extract, Farmers Bulletin. U. S. Agricultural Department, W. D.

PRINCIPLES OF CANNING AND PRESERVING.

In the preservation of foods by canning, preserving, etc., the most essential things in the processes are the sterilization of the food and all the utensils and the sealing of the sterilized food to exclude all germs.

BACTERIA, YEASTS, AND FERMENTATION.

Over one hundred years ago Francois Appert was the first to make practical application of the method of preserving food by putting it in cans or bottles, which he hermetically sealed. He then put the full bottles or cans in water and boiled them for more or less time, depending upon the kinds of food.

In Appert's time and, indeed, until recent years it was generally thought that the oxygen of the air caused the decomposition of food. Appert's theory was that the things essential to the preservation of food in this manner were the exclusion of air and the application of gentle heat, as in the water bath, which caused a fusion of the principal constituents and ferments in such a manner that the power of the ferments was destroyed.

The investigations of scientists, particularly of Pasteur, have shown that it is not the oxygen of the air which causes fermentation and putrefaction, but bacteria and other microscopic organisms.

Appert's theory as to the cause of the spoiling of food was incorrect, but his method of preserving it by sealing and cooking was correct, and the world owes him a debt of gratitude.

In their investigations scientists have found that if food is perfectly sterilized and the opening of the jar or bottle plugged with sterilized cotton, food will not ferment, for the bacteria and yeasts to which such changes are due can not pass through the cotton. This method can not be conveniently followed with large jars.

Bacteria and yeasts exist in the air, in the soil, and on all vegetable and animal substances, and even in the living body, but although of such universal occurrence, the true knowledge of their nature and economic importance has only been gained during the last forty years.

There are a great many kinds of these micro-organisms. Some do great harm, but it is thought that the greater part of them are beneficial rather than injurious.

Bacteria are one-celled and so small they can only be seen by aid of a microscope. The process of reproduction is simple and rapid. The bacterium becomes constricted, divides, and finally there are two cells instead of one. Under favorable conditions each cell divides, and so rapid is the work that it has been estimated that one bacterium may give rise, within twenty-four hours, to seventeen millions of similar organisms. The favorable conditions for growth are moisture, warmth, and proper food.

Yeasts, which are also one-celled organisms, grow less rapidly. A bud developes, breaks off, and forms a new yeast plant. Some yeasts and some kinds of bacteria produce spores. Spores, like the dried seeds of plants, may retain their vitality for a long time, even when exposed to conditions which kill the parent organism.

Yeasts and nearly all bacteria require oxygen, but there are species of the latter that seem to grow equally well without it, so that the exclusion of air, which, of course, contains oxygen, is not always a protection, if one of the anaerobic bacteria, as the kinds are called which do not require oxygen, is sealed in the can.

Spoiling of food is caused by the development of bacteria or yeasts. Certain chemical changes are produced as shown by gases, odors, and flavors.

Bacteria grow luxuriantly in foods containing a good deal of nitrogenous material, if warmth and moisture are present. Among foods rich in nitrogenous substances are all kinds of meat, fish, eggs, peas, beans, lentils, milk, etc. These foods are difficult to preserve on account of the omnipresent bacteria. This is seen in warm, muggy weather, when fresh meat, fish, soups, milk, etc., spoil quickly. Bacteria do not develop in substances containing a large percentage of sugar, but they grow rapidly in a suitable wet substance which contains a small percentage of sugar. Yeasts grow very readily in dilute solutions containing sugars in addition to some nitrogenous and mineral matters. Fruits are usually slightly acid and in general do not support bacterial growth, and so it comes about that canned fruits are more commonly fermented by yeasts than by bacteria.

Some vegetable foods have so much acid and so little nitrogenous substance that very few bacteria or yeasts attack them. Lemons, cranberries, and rhubarb belong to this class.

Temperature is an important factor in the growth of bacteria and yeasts. There are many kinds of these organisms, and each kind grows best at a certain temperature, some at a very low one and others at one as high as 125° F., or more. However, most kinds of bacteria are destroyed if exposed for ten or fifteen minutes to the temperature of boiling water (212° F.); but, if the bacteria are spore producers, cooking must be continued for an hour or more to insure their complete destruction. Generally speaking, in order to kill the spores the temperature must be higher than that of boiling water, or the article to be preserved must be cooked for about two hours at a temperature of 212° F., or a shorter time at a higher temperature under pressure. Yeasts and their spores are, however, more easily destroyed by heat than bacteria spores. Hence, fruits containing little nitrogenous material are more easily protected from fermentation than nitrogenous foods in which in general fermentation is caused by bacteria. Of course, it is not possible to know what kinds of organisms are in the food one is about to can or bottle; but we do know that most fruits are not favorable to the growth of bacteria,

and, as a rule, the yeasts which grow in fruits and fruit juice can be destroyed by cooking ten or fifteen minutes at a temperature of 212° F. If no living organisms are left, and the sterilization of all appliances has been thorough, there is no reason why the fruit, if properly sealed, should not keep, with but slight change of texture or flavor, for a year or longer, although canned fruits undergo gradual change and deterioration even under the most favorable conditions.

When fruit is preserved with a large amount of sugar (a pound of sugar to a pound of fruit) it does not need to be hermetically sealed to protect it from bacteria and yeasts, because the thick, sugary sirup formed is not favorable to their growth. However, the self-sealing jars are much better than keeping such fruit in large receptacles, from which it is taken as needed, because molds grow freely on moist, sugary substances exposed to the air.

MOLDS AND MOLDING.

Every housekeeper is familiar with molds which, under favorable conditions of warmth and moisture, grow upon almost any kind of organic material. This is seen in damp, warm weather, when molds form in a short time on all sorts of starchy foods, such as boiled potatoes, bread, mush, etc., as well as fresh, canned, and preserved fruits.

Molds develop from spores which are always floating about in the air. When a spore falls upon a substance containing moisture and suitable food it sends out a fine thread, which branches and works its way over and into the attacked substance. In a short time spores are produced and the work of reproduction goes on.

In the first stages molds are white or light gray and hardly noticeable; but when spores develop the growth gradually becomes colored. In fact, the conditions of advanced growth might be likened to those of a flower garden. The threads—mycelium—might be likened to the roots of plants and the spores to the flower and seeds.

Mold spores are very light and are blown about by the wind. They are a little heavier than air, and drop on shelves, tables, and floor, and are easily set in motion again by the movement of a brush, duster, etc. If one of these spores drops on a jar of preserves or a tumbler of jelly, it will germinate if there be warmth and moisture enough in the storeroom. Molds do not ordinarily cause fermentation of canned foods, although they are the common cause of the decay of raw fruits. They are not as injurious to canned goods as are bacteria and yeasts. They do not penetrate deeply into preserves or jellies, or into liquids or semi-liquids, but if given time they will, at ordinary room temperature, work all through suitable solid substances which contain moisture. Nearly every housekeeper has seen this in the molding of a loaf of bread or cake.

In the work of canning, preserving, and jelly making it is important that the food shall be protected from the growth of molds as well as the growth of yeasts and bacteria.

To kill mold spores food must be exposed to a temperature of from 150° F. to 212° F. After this it should be kept in a cool, dry place and covered carefully that no floating spore can find lodgment on its surface.

STERILIZATION.

To sterilize a substance or thing is to destroy all life and sources of life in and about it. In following the brief outline of the structure and work of bacteria, yeasts, and molds, it has been seen that damage to foods comes through the growth of these organisms on or in the food; also that if such organisms are exposed to a temperature of 212° F., life will be destroyed, but that spores and a few resisting bacteria are not destroyed at a temperature of 212° F., unless exposed to it for two or more hours.

Bacteria and yeasts, which are intimately mixed with food, are not as easily destroyed as are those on smooth surfaces, such as the utensils and jars employed in the preparation of the food.

Since air and water, as well as the foods, contain bacteria and yeasts, and may contain mold spores, all utensils used in the process of preserving foods are liable to be contaminated with these organisms. For this reason all appliances, as well as the food, must be sterilized.

Stewpans, spoons, strainers, etc., may be put on the fire in cold or boiling water and boiled ten or fifteen minutes. Tumblers, bottles, glass jars, and covers should be put in cold water and heated gradually to the boiling point, and then boiled for ten or fifteen minutes. The jars must be taken one at a time from the boiling water at the moment they are to be filled with the boiling food. The work should be done in a well swept and dusted room, and the clothing of the workers and the towels used should be clean. The food to be sterlized should be perfectly sound and clean.

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—*Extract, Farmers Bulletin No. 203.*

METHODS OF MAKING JELLY.

In no department of preserving does the housekeeper feel less sure of the result than in jelly making. The rule that works perfectly one time fails another time. Why this is so the average housekeeper does not know; so there is nearly always an element of uncertainty as to the result of the work. These two questions are being constantly asked: "Why does not my jelly harden?" "What causes my jelly to candy?"

It is an easy matter to say that there is something in the condition of the fruit, or that the fruit juice and sugar were cooked too short or too long a time. These explanations are often true; but they do not help the inquirer, since at other times just that proportion of sugar and time of cooking have given perfect jelly. In the following pages an attempt is made to give a clear explanation of the principles underlying the process of jelly making. It is believed that the women who study this carefully will find the key to unvarying success in this branch of preserving.

Pectin, Pectose, Pectase.

In all fruits, when ripe or nearly so, there is found pectin, a carbohydrate somewhat similar in its properties to starch. It is because of this substance in the fruit juice that we are able to make jelly. When equal quantities of sugar and fruit juice are combined and the mixture is heated to the boiling point for a short time, the pectin in the fruit gelatinizes the mass.

It is important that the jelly maker should understand when this gelatinizing agent is at its best. Pectose and pectase always exist in the unripe fruit. As the fruit ripens the pectase acts upon the pectose, which is insoluble in water, converting it into pectin, which is soluble. Pectin is at its best when the fruit is just ripe or a little before. If the juice ferments, or the cooking of the jelly is continued too long, the pectin undergoes a change and losses its power of gelatinizing. It is, therefore, of the greatest importance that the fruit should be fresh, just ripe or a little underripe, and that the boiling of the sugar and juice should not be continued too long.

Fruits vary as to the quantities of sugar, acid, pectin, and gums in their composition. Some of the sour fruits contain more sugar than do some of the milder-flavored fruits. Currants, for example, often contain four or five times as much sugar as the peach. The peach does not contain so much free acid and it does contain a great deal of pectin bodies, which mask the acid; hence, the comparative sweetness of the ripe fruit.

Selection and Handling of Fruit for Jelly Making.

An acid fruit is the most suitable for jelly making, though in some of the acid fruits, the strawberry, for example, the quantity of the jelly-making pectin is so small that it is difficult to make jelly with this fruit. If, however, some currant juice be added to the strawberry juice, a pleasant jelly will be the result; yet, of course, the flavor of the strawberry will be modified. Here is a list of the most desirable fruits for jelly making. The very best are given first: Currant, crab apple, apple, quince, grape, blackberry, raspberry, peach.

Apples make a very mild jelly, and it may be flavored with fruits, flowers, or spices. If the apples are acid it is not advisable to use any flavor.

Juicy fruits, such as currants, raspberries, etc., should not be gathered after a rain, for they will have absorbed so much water as to make it difficult, without excessive boiling, to get the juice to jelly.

If berries are sandy or dusty it will be necessary to wash them, but the work should be done very quickly so that the fruit may not absorb much water.

Large fruits, such as apples, peaches, and pears, must be boiled in water until soft. The strained liquid will contain the flavoring matter and pectin.

It requires more work and skill to make jellies from the fruits to which water must be added than from the juicy fruits. If the juicy fruits are gathered at the proper time one may be nearly sure that they contain the right proportion of water. If gathered after a rain the fruit must be boiled a little longer that the superfluous water may pass off in steam.

In the case of the large fruits a fair estimate is 3 quarts of strained juice from 8 quarts of fruit and about 4 quarts of water. If the quantity of juice is greater than this it should be boiled down to 3 quarts.

Apples will always require 4 quarts of water to 8 quarts of fruit, but juicy peaches and plums will require only 3 or 3½ quarts.

The jelly will be clearer and finer if the fruit is simmered gently and not stirred during the cooking.

It is always best to strain the juice first through cheese cloth and without pressure. If the cloth is double the juice will be quite clear. When a very clear jelly is desired the strained juice should pass through a flannel or felt bag. The juice may be pressed from the fruit left in the strainer and used in marmalade or for a second-quality jelly.

To make jelly that will not crystallize (candy) the right proportion of sugar must be added to the fruit juice. If the fruit contains a high percentage of sugar, the quantity of added sugar should be a little less than the quantity of fruit juice. That is to say, in a season when there has been a great deal of heat and sun-

shine there will be more sugar in the fruit than in a cold, wet season; consequently, 1 pint of currant juice will require but three-quarters of a pint of sugar. But in a cold, wet season the pint of sugar for the pint of juice must be measured generously.

Another cause of the jelly crystallizing is hard boiling. When the sirup boils so rapidly that particles of it are thrown on the upper part of the sides of the preserving kettle they often form crystals. If these crystals are stirred into the sirup they are apt to cause the mass to crystallize in time.

The use of the sirup gauge and care not to boil the sirup too violently would do away with all uncertainty in jelly making. The sirup gauge should register 25°, no matter what kind of fruit is used.

Jellies should be covered closely and kept in a cool, dry, dark place.

Currant Jelly.

The simplest method of making currant jelly is perhaps the following: Free the currants from leaves and large stems. Put them in the preserving kettle; crush a few with a wooden vegetable masher or spoon; heat slowly, stirring frequently.

When the currants are hot, crush them with the vegetable masher. Put a hair sieve or strainer over a large bowl; over this spread a double square of cheese cloth. Turn the crushed fruit and juice into the cheese cloth, and let it drain as long as it drips, but do not use pressure. To hasten the process take the corners of the straining cloth firmly in the hands and lift from the sieve; move the contents by raising one side of the cloth and then the other. After this put the cloth over another bowl. Twist the ends together and press out as much juice as possible. This juice may be used to make a second quality of jelly.

The clear juice may be made into jelly at once, or it may be strained through a flannel bag. In any case, the method of making the jelly is the same.

Measure the juice, and put it in a clean preserving kettle. For every pint of juice add a pint of granulated sugar.

Stir until the sugar is dissolved, then place over the fire; watch closely, and when it boils up draw it back and skim; put over the fire again, and boil and skim once more; boil and skim a third time; then pour into hot glasses taken from the pan of water on the stove and set on a board. Place the board near a sunny window in a room where there is no dust. It is a great protection and advantage to have sheets of glass to lay on top of the tumblers.

To make very transparent currant jelly, heat, crush, and strain the currants as directed in the simplest process. Put the strained juice in the flannel bag and let it drain through. Measure the juice and sugar, pint for pint, and finish as directed above.

To make currant jelly by the cold process follow the first rule for jelly as far as dissolving the sugar in the strained juice. Fill warm, sterilized glass with this. Place the glasses on a board and

put the board by a sunny window. Cover with sheets of glass and keep by the window until the jelly is set. The jelly will be more transparent if the juice is strained through the flannel bag. Jelly made by the cold process is more delicate than that made by boiling, but it does not keep so well.

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—*Extract, Farmers Bulletin No. 203, U. S. Department of Agriculture.*

THE KEEPING OF VEGETABLES, FRUITS, AND MEATS.

The following hints regarding the keeping of different kinds of food may be found useful:

Potatoes are kept without difficulty in a cool, dry, and dark place. Sprouts should not be allowed to grow in the spring.

Such roots as carrots, parsnips, and turnips remain plump and fresh if placed in earth or sand filled boxes on the cellar floor.

Sweet potatoes may be kept until January if cleaned, dried, and packed in chaff so that they will not touch each other.

Pumpkins and squash must be thoroughly ripe and mature to keep well. They should be dried from time to time with a cloth and kept, not on the cellar floor, but on a shelf, and well separated from each other.

Cabbages are to be placed in barrels, with the roots uppermost.

Celery should be neither trimmed nor washed, but packed, heads up, in long, deep boxes, which should then be filled with dry earth.

Tomatoes may be kept until January, if gathered just before frost, wiped dry, and placed on straw-covered racks in the cellar. They should be firm and well-grown specimens, not yet beginning to turn. As they ripen they may be taken out for table use, and any soft or decaying ones must be removed.

Apples, if for use during the autumn, may be stored in barrels without further precaution than to look them over now and then to remove decaying ones; but if they are to be kept till late winter or spring they must be of a variety known to keep well and they must be hand-picked and without blemish or bruise. They should be wiped dry and placed with little crowding on shelves in the cellar. As a further precaution they may be wrapped separately in soft paper.

Pears may be kept for a limited time in the same way, or packed in sawdust or chaff, which absorbs the moisture which might otherwise favor molding.

Oranges and lemons are kept in the same way. Wrapping in soft paper is here essential, as the uncovered skins if bruised offer good feeding ground for mold. Oranges may be kept for a long time in good condition if stored where it is very cold but where freezing is not possible. Lemons and limes are often kept in brine, an old-fashioned household method.

—*Extract, U. S. Department of Agriculture, Farmers Bulletin No. 128.*

Laundry

Flora Rose.

Cleaning is a sanitary measure; without it health may be endangered and life shortened.

Dirt in itself may not always be harmful, but its ounce of "prevention" is one of the most important sanitary measures in the home, also is the weekly washing. It is not merely in order to gratify our sense of cleanliness that we go to the extreme of upsetting the family routine one day each week but also to prevent soiled clothing to become dangerous to its wearer.

Washing then, has a three-fold purpose: to remove dirt and thus re-open the pores of the cloth, to dry the cloth so as to renew its power of absorption, and to destroy any bacteria that may be in it. As a household process laundering often proves an arduous task instead of an interesting occupation, for, unfortunately, many houses are not equipped in a way to remove the burdens incident to washday.

Why is soiled clothing dangerous to its wearer?

The skin acts as a heating regulating apparatus through evaporation of perspiration, and thus reduces body heat. It also serves in some manner to eliminate the wastes of the body in the form of secretions. Perspirations and secretions are absorbed by clothing and bits of dead skin are continually being rubbed off to find their way into the meshes of the fabric. After a time the limit of absorption by clothing is reached, its pores become clogged and the clothing begins to have a damp, sticky and oily feeling.

If it has been starched the garment becomes limp. In this condition, if clothing is not actually dirty, it is at least unwholesome to wear, for it prevents proper absorption and evaporation of moisture from the body and thus actually increases its warmth in summer and its cold in winter.

A scientific knowledge of the laundry and its entirety is a requisite for the housekeeper.

FABRICS.

A first step toward gaining necessary knowledge of laundry methods is to learn something of the nature of the fabrics to be laundered and how they respond to the cleansing agents or solvents generally used in the laundry. The common fibers used for clothing are of both vegetable and animal origin. The chief vegetable fibers

are cotton and linen; the animal fibers, wool and silk. Among the common laundry cleansing agents, called reagents, are two classes of chemicals known as acids and bases. Acids were so named because of the sour taste common to many of them. Acids and bases possess as a characteristic property the power to unite with each other to form a third substance called a salt. Therefore they are said to neutralize each other; for the biting acid and the eating base have through their union become harmless or neutral. For example: if hydrochloric acid (muriatic acid) and sodium hydroxid (lye), both of which if strong can almost instantly eat holes in any fabric and even into flesh itself, are united in certain proportions a harmless salt, common table salt, is formed. The bases chiefly used in the laundry are known as alkalis. The chief household alkalis are lye, washing soda, ammonia, and borax.

Cotton and Linen.

The soft fibrous material covering the seeds of the cotton plant is known as cotton. If a single mature cotton fiber were examined under the microscope, it would show itself to be a long, flattened, twisted tube, thicker at the edges than in the middle. Its hollow, twisted condition gives to cotton a characteristic lightness and elasticity, making it suitable for the manufacture of fine yarns. Linen is a product of the flax plant. A linen fiber under the microscope looks like a long, transparent tube with thick, smooth walls and a central canal. Fabric made from linen is stronger and more lustrous than that made from cotton and is a better conductor of heat. Both cotton and linen consist for the most part of a plant substance, cellulose, and they respond similarly to chemical substances or to cleansing agents.

Action of acids on cotton and linen.—Strong mineral acids have an eating (corrosive) action on cotton and linen; if they are allowed to eat for any length of time, the fabrics are entirely destroyed. Such eating, or corrosion, is greatly increased by heat. Cold dilute mineral acids affect the fabrics but little if the acid is thoroughly washed out immediately after its use, but the cloth may be seriously injured if the acid is allowed to dry on it. The appearance of the cloth may not undergo any change, but its durability will be affected. The mineral acid having the least effect on vegetable fibers is hydrochloric acid, more commonly known to the housekeeper as muriatic acid; but hydrochloric acid also damages fabric if allowed to dry on it.

The organic acids—such as acetic acid in vinegar, oxalic acid in tomatoes, tartaric acid in grapes, and citric acid in lemons—have no action on cotton and linen unless they are allowed to dry on the fabric and are subsequently moistened and ironed dry with a hot iron. Then destructive results are produced.

The presence of starch in the cloth lessens the destructive action of any of the acids on it.

Action of alkalis on cotton and linen.—The action of alkalis on cellulose differs from that of acids. Dilute washing-soda solution, borax, and soap have little or no harmful action on cotton or linen, but lye is more destructive to these fabrics, especially at high temperatures and if allowed to act for any length of time in the presence of air. If a fabric made from cotton fibers is immersed for two minutes in a strong solution of lye it assumes a gelatinous appearance, and if it is then immediately removed and washed free of the lye it is found to have shrunken greatly and to have become much closer and firmer in texture than it was before the immersion. The action of the strong alkali for the limited time mentioned has actually strengthened the cloth. It was thought at one time that the process just described would be very valuable in the manufacture of textile goods, but it so increased the strength of the fabric treated that garments were slow to wear out; hence its use was discontinued because it lessened sales for the manufacturer. A modification of the process, known as mercerization, gives to cotton goods a glossy, silky appearance without materially increasing its durability. It must not be thought, however, that because the limited action of strong alkali strengthens a fabric, its long-continued action will be harmless. Its first effect is strengthening, but if its action is continued beyond the brief time mentioned it will gradually destroy cloth.

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WATER.

A bountiful supply of water good for laundry purposes is an important factor in successful laundering. Water is the natural solvent for much of the dirt that accumulates on clothing; moreover, it acts as a carrier to rid the clothing of all forms of dirt, both soluble and insoluble. A water good for the laundry should be clean, soft, clear, odorless, free from discoloration, free from iron, free from organic matter.

Hard and Soft Water.

The very characteristic (its solvent power) that renders water valuable as a cleansing agent (detergent) is the cause of its greatest shortcomings; for on its way to us water may pass over, or through, soils that contain soluble substances of an undesirable nature. The characteristic known as hardness, possessed by some waters, is due to the presence of lime salts gathered in the way described. Hard water is not the best for laundry purposes, as lime salts decompose the soap used and form in its place an insoluble lime soap, which collects as a curd on the surface of the water. Such soap decomposition takes place as long as any lime remains in the water and the cleansing (detergent) properties of soap are not in

operation until every bit of lime has combined with soap to form lime soap. By leaving minute particles of lime soap in its pores, hard water is said to weaken a fabric. If the available supply of water is hard, then, the problem of the housekeeper is to find some means of removing lime or of reducing its ill effects.

Temporary and permanent hardness.—According to the nature of the lime salts present, water is said to be either temporarily or permanently hard. Temporary hardness is caused by the presence of carbonate of lime, and such water may be softened by boiling. If the boiled water is allowed to stand, the lime settles at the bottom of the receptacle and the softened water may be drawn from the top of it. Permanent hardness is due to the presence of sulfate of lime. Boiling has no softening effect on permanently hard water.

Another salt often very obnoxious in laundry water is iron. Its presence, even in very small amounts, may give a yellow tinge to clothing, owing to the deposit of minute particles of iron rust in the pores of the fabric.

Organic matter may be present in the water used for laundry purposes, which causes clothing washed in it to become dangerous to the wearer. It is very desirable in all the cited cases to eliminate mischievous substances.

A number of materials for softening water are on the market. The cheapest and best of them are alkalis, known as washing soda, lye, borax, and ammonia. In softening water the objection to the use of any chemical is the injury it may do to the fabric.

Materials for Softening Water.

Washing soda (sodium carbonate).—Washing soda is the best alkali to soften water for general household use, for, while effective in its action, it is not so corrosive as to render its handling difficult or its use unduly harmful, nor is it expensive. It should never be used in its dry form, however, for it is an alkali sufficiently strong to eat holes in a fabric if it is used in full strength, and wherever a particle of the dry substance falls a strong solution is formed. Carelessness causes many of the complaints against present-day laundry methods.

Lye (sodium hydroxid or caustic soda).—Lye is an alkali of far greater strength than washing soda; one pound of lye being equal to about twelve pounds of washing soda, it should be used with just so much the greater caution. It should never be used save in solution and, as the solution deteriorates very rapidly on exposure to air, if any quantity is made it should be kept in bottles or jars tightly stoppered with rubber stoppers. The compound formed by exposing lye to the action of air and water, is washing soda, so there is no advantage in using it after all. Lye is much more difficult to handle, and its action is so much more corrosive than is that of other alkalis that it is not advisable to use it in the home laundry.

Borax (sodium biborate).—One of the mildest alkalis to use in the laundry is borax. This alkali is more expensive than either lye or washing soda and is not so vigorous in its action; but in some instances it is greatly to be preferred to either lye or washing soda. Washing soda and lye, unless they are thoroughly rinsed from clothing, have a tendency to cause yellowing, particularly when starch is used afterward. Borax, on the other hand, has a tendency to whiten fabrics and is added directly to starch, in order to give it good color and to increase its clearness. When colored fabrics or wools are to be washed in hard water, borax is one of the best alkalis to use for softening the water; therefore it should be on the laundry shelf for that purpose if for no other.

Ammonia (ammonium hydroxid).—Ammonia is another good alkali for softening water when it is not advisable to use stronger alkalis. Ammonia is a very volatile substance, consequently it should be used only when the laundry process is to be conducted quickly. It is better and cheaper to purchase the full-strength ammonia from a druggist and then dilute it, than to buy the article known as household ammonia, which is of unknown strength.

To soften water.—Both permanently and temporarily hard water may be softened by distillation, but that method involves apparatus not practicable for the average home.

If water is temporarily hard, however, it may be softened by being boiled, then allowed to stand until the lime settles. The top water is afterward drawn off. The method of boiling water to soften it is without doubt the best if it softens the water sufficiently, as no harmful chemicals are left in the water to injure fabrics.

Either temporarily or permanently hard water may be softened by adding lime or washing soda to the water, then allowing it to stand in open kegs for several days before its use. The water should then be drawn from the top. If the water is boiled after the addition of the softening agent, the time for standing may be considerably lessened. Neither of the two processes just described is much in use in the household, as the time consumed by them is often considered unwarranted. The more common method is to add washing soda, lye, borax, or ammonia at the time of washing. The addition of one of those substances at that time prevents the action of the lime on the soap. A good suds may thus quickly be procured, but it does not rid the water of the lime-soap curd which forms and which, in part at least, becomes entangled in the pores of the cloth. The entangled curd has a weakening action on the fabric and gives it a close, filled-in appearance.

The only satisfactory method of getting rid of iron is to add washing soda to the water, then let the water settle for five or six days before using it. The top water is afterward drawn off.

Water may be softened by any of the following methods:

1. For each gallon of water, use two tablespoons of a solution

made by dissolving one pound of washing soda in one quart of boiling water. The solution should be bottled and kept on hand, as it is a useful cleansing agent (detergent).

2. For each gallon of water use one-fourth tablespoon of lye dissolved in one cup of water.

3. For each gallon of water use one tablespoon of borax dissolved in one cup of water.

If water is very hard, increase the amount of alkali used.

Organic Matter.

Organic material may be precipitated by the use of alum in the form of an alum-borax mixture. The sediment should be allowed to settle and the water may then be drawn from the top.

To remove organic matter.—For each gallon of water use one tablespoon of a mixture made up of two thirds borax and one third alum. If the water is rich in organic matter, use more than one tablespoon of the mixture. When water is very scarce, alum is sometimes used to separate the dirt from the water and the water is then filtered and used again.

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The Adulteration of Soap.

It is not uncommon to find some foreign, insoluble substances in soap, which have been added merely to increase its weight and bulk. In cheap soaps resin is often added as an adulterant. It is rather difficult to say when resin may be considered an adulterant, for in small quantities it is of value in laundry soaps because it whitens the clothing. Resin gives a brown color to soap, therefore a dark brown soap may safely be rejected as containing an excess of resin.

The best advice to give the housekeeper is: Select soap manufactured by a reliable firm and give it a trial. It is not economy to use cheap, poorly made soaps in the laundry. A common mistake is to think that the use of one kind of soap will prove satisfactory for all purposes; this common belief possibly accounts for much of the dissatisfaction that exists regarding the various soaps on the market. In the manufacture of soap, when just sufficient alkali is used to change completely all the fat present into soap, the soap is known as a mild soap. If an excess of alkali is used, either a medium or a strong soap is produced, the degree of strength depending on the amount of free alkali left in the soap. Every laundry should contain all three grades of soap, mild medium, strong. A mild soap should always be used when the presence of even a small amount of free lye would be injurious in washing flannels, woolen goods, or fabrics either frail or delicate in color. A medium soap should be used for the more durable colored goods. A strong soap is best for most white goods, both cotton and linen.

Action of Soap.

This leads us to consider the way in which soap acts as a cleansing agent. Much of the dirt in clothing is due to the adherence of particles of dust to the fatty impurities that have accumulated on the fabric. While rubbing and water alone will loosen and remove much of ordinary dirt, the process of removal is greatly facilitated by the use of a soap solution. Soapsuds penetrates the pores of a fabric more completely than does water; thus, first, it softens dirt; second, it emulsifies the fats, that is, soapy water acts to divide fatty material into very minute particles, which are removed from clothing by rubbing and pounding. The particles are then held in suspension in the suds. The adherent dirt is caught in the emulsion and the whole is carried away in the washing process. When free alkali is present it unites with the fatty impurities present to form more soluble soap; this action removes a part of the fat and aids in removing more in the process of emulsification. These facts serve to illustrate the desirability of the use of strong soaps when much grease is present.

Aside from its use in removing dirt, soap has antiseptic properties. It is not safe to depend on it as the only disinfectant in cases of contagious diseases, but it is a valuable purifier for the ordinary household washing.

Soap Substitutes and Accessories.

Soap is the best all-round cleansing agent to use in the laundry, but there are other substances with similar cleansing properties that may be used with good results in its place:

Substances that facilitate the washing process.—Various substances are used with soap to facilitate or accelerate the washing process. Among them may be mentioned lye, washing soda, borax, and ammonia; turpentine, paraffin, kerosene, and benzine; and fuller's earth.

Borax and ammonia are mild alkalis and may be very useful when the presence of some free alkali is needed and the effect of a strong soap would be injurious. They are often utilized in connection with a neutral or mild soap for washing flannels and delicately colored fabrics.

Turpentine, paraffin, kerosene, and benzine all are valuable aids to the laundress, for they exert a solvent action on matter of a fatty nature and thus soften and loosen dirt, materially facilitating the washing process. The disadvantage in the use of turpentine, paraffin, and kerosene is, that clothing in the washing of which they have been used may be insufficiently rinsed afterward and retain the odor of them. Benzine is dangerous to handle because of its inflammability, and cannot be used with very hot water because it evaporates.

Fuller's earth is a valuable adjunct in cleaning, and is sometimes used partly to replace soap in the washing process when the articles to be washed are in a very greasy condition and the use of a strong soap is not sufficient, and when the use of a strong alkali is not advisable.

Manufacturers have put on the market various soaps and powders that have incorporated with them some one or more of the above substances. Naphtha and borax soaps and soaps containing fuller's earth may be purchased and give satisfaction. Good results may be obtained at less cost by the use of soap and the accessory material uncombined, though it may often be more convenient to use the manufactured article that is a combination of the two.

Washing powders.—Something should be said of washing powders. They are mixtures of soap and some alkali such as lye, washing soda, and borax, and may have incorporated with them some one or more of the substances of the nature of turpentine, paraffin, fuller's earth. In the case of the poorer powders a "filler" is used, that is, a substance giving weight to the powder and very properly considered an adulterant. The best powders contain large amounts of soap and only small amounts of alkali. A report is made of one of the poorer varieties of washing powder containing only 10 per cent of soap. Enough has been said in connection with the effect of alkalis and their use to guide the housekeeper in her purchase and use of these powders. There may be occasions when a washing powder is desirable, but indiscriminate use of these strong cleansing agents is inadvisable and should not be generally indulged in.

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Soap solution for ordinary purposes:

1 bar ordinary washing soap
2 to 3 quarts water
Shave soap and put into saucepan with cold water. Heat gradually until soap is dissolved (about 1 hour).

Soap solution for soaking clothes:

1 bar ordinary soap
3 gallons water
½ to 1 tablespoon turpentine.
1 to 3 tablespoons ammonia.

Soap solution for washing much-soiled woolens and delicate colors:

½ pound very mild or neutral soap
¼ pound borax
3 quarts water

Soap jelly with turpentine incorporated:

1 bar soap
1 quart water
1 teaspoon turpentine or kerosene

A liquid for washing delicate fabrics and colors may be made from laundry starch, grated potatoes, rice, flour, etc. The water in which rice has boiled may be saved and utilized for the same purpose. The cleansing liquid after cooking should be as thick as cream and should be diluted from one to four times, according to the amount of dirt in the clothing. Rinse clothing in a more dilute solution, which may be blued for white clothes.

STARCH.

Starch is in the form of minute compact granules, insoluble in water, obtained from many plant tissues. We are familiar with the powder that a mass of these granules forms. When starch granules are subject to the action of heat and moisture, the heat causes the moisture to penetrate the granules; they swell, burst, and form a thick, sticky mass known as starch paste. Starch has the power of penetrating the pores of a fabric. The kind of starch used determines its penetrating power. On drying, it gives to clothing a characteristic stiffness.

There is a twofold reason for the use of starch in laundry operations: first, the glazed surface of starched garment keeps clean longer than an unglazed (unstarched) surface; second, the increase in body of the starched garment gives it increased resistance to moisture and the garment is considered correspondingly more attractive in appearance. In the commercial laundry and in those industries in which the finishing of fabrics is a consideration, use is made, not of one kind of starch, but several, according to the nature of the work to be done. We are all familiar with the especially attractive appearance of the nicely laundered new garment as it comes to us fresh from the factory. Starching in the factory and in the commercial laundry has been reduced to a science, in which intelligent knowledge and skill in the use of materials play an important part.

The three kinds of starch chiefly used in the commercial laundry are rice starch, wheat starch, and cornstarch. In Belgium and France, as well as in other European countries where laundry work is of noted excellence, rice starch is used almost exclusively. The finer quality of the work done seems to justify the purchase of the higher-priced rice starch.

Little rice starch is used in this country except in the textile industries for finishing fine fabrics, such as lawns and organdies. It is not used because of its cost, because of the greater convenience of using the starches that are locally produced in large quantities, the possibility of getting very good and nearly similar results with wheat starch, and the American preference for the greater body that wheat starch and corn starch give.

The American housekeeper uses, as a rule, only cornstarch, because of the cheapness of cornstarch and a lack of knowledge of the different characteristics of the other starches. It is interesting

to note how the exclusive household use of cornstarch has withdrawn other varieties of starch from the shelves of the retail grocery, until it is practically impossible for the housekeeper to obtain wheat starch unless she buys it from the big laundry-supply companies.

The purpose of the launderer is to blend starch with the fabric in such a way as to make the starch a natural part of the cloth; to give the desired degree of stiffness and yet keep the fabric pliable; to give a body as enduring as possible and capable of resisting moisture; to give clearness, good color, and any desired finish, whether dull or glazed. That purpose can be accomplished only with a knowledge of the materials to be used.

The several varieties of starch vary considerably in their ability to penetrate fabrics. The reason for the use of rice starch with finer fabrics by those considered to do a superior grade of laundry work, is because of its penetrating quality. It is said to penetrate the pores of a fabric more completely than does any other starch and to give a finer, smoother finish. Next to rice starch in penetrability comes wheat starch. Corn starch is the poorest of the three starches; it has a tendency to lump and show starch spots after ironing.

Rice starch gives a natural, pure white color to fabrics, while cornstarch gives a yellow color, and wheat starch a color between the two. Since wheat starch and cornstarch are the practical possibilities in the American household, further comparison will be between these two. When good color, smoothness of surface, pliability, and fine finish are desired, wheat starch gives the better results; moreover, it is said to hold up better in damp climates. Cornstarch gives the greater stiffness, or body, to a fabric.

According to the finish desired, advantage is taken of the different characteristics of wheat starch and cornstarch. When flexibility and finish are the main objects, wheat starch is used alone; if stiffness is the chief consideration and finish may be overlooked, cornstarch is used alone; when it is desirable to combine stiffness with flexibility and good finish, a mixture of cornstarch and wheat starch is used. There is no reason why the use of wheat starch should not extend to the home laundry, and it is to be hoped that the time will come when the retail trade will place wheat starch on the grocery shelf.

Various substances are used with starch to increase its penetrability and prevent it from sticking to the iron, as well as to give pliability to the cloth, increase its body, and improve its color. Of these substances may be mentioned borax, alum, paraffin, wax, turpentine, kerosene, gum arabic, glue, and dextrin.

Borax in Starch.—Borax increases the penetrability of starch and aids in preventing it from sticking to the iron. Moreover, starch containing borax adds gloss to a garment, increases its whiteness, and gives it greater body, together with more lasting stiffness, than it would otherwise have.

Alum.—Alum is used alone, or with borax, in starch to improve color, to increase penetrability and pliability, and, last but not least, to thin the starch mixture. When alum is cooked with a starch paste it causes the paste to become thinner "Cooking thin" with alum does not affect the strength of the starch mixture and is an advantage when a stiff starch is desirable and the thick mixture would be inconvenient to handle. By the use of alum, starch may be made thin without dilution. Alum has been objected to by some persons as being somewhat injurious to fabrics.

Wax, paraffin, turpentine, lard, butter.—Oily substances are used to add a smoothness, gloss, and finish, to prevent the starch from sticking to the iron, and to aid in preventing the absorption of moisture.

Gum arabic, glue, and dextrin.—Substances resembling glue are used with starch to increase its stiffening power. They are sometimes used alone when the white color of starch is considered a disadvantage in stiffening colored fabrics.

Directions for using starch, starch substitutes, and starch accessories.—In making starch a naturally soft water is greatly to be desired, but if the water furnished is hard it should be softened with borax, not with washing soda nor lye, since washing soda and lye tend to produce a yellow color with starch:

1. ¼ cup wheat starch to 1 quart water gives flexible, light, durable finish.
2. ¼ cup cornstarch to 1 quart water gives moderate body stiffness.
3. ½ cup wheat starch to 1 quart water gives flexible, firm finish.
4. ½ cup cornstarch to 1 quart water gives stiff body finish.

A mixture of the two starches may be varied, to produce any desired result.

Directions for cooking starch.—Starch should first be mixed with a little cold water and then stirred slowly into boiling water and cooked in accordance with the following directions:

1. If wheat starch is used, cook slowly at least 25 or 30 minutes.
2. If cornstarch is used, cook slowly 15 or 20 minutes.
3. If a mixture of wheat starch and cornstarch is used, the wheat starch should be added first and cooked 15 minutes. The cornstarch should then be added and the mixture cooked 15 minutes longer. Stir mixture frequently, to prevent sticking and formation of a skin.

Thorough cooking of starch is very desirable in laundry practice, for it increases the penetrability of the starch and decreases its tendency to stick to the iron. If borax, lard, butter, kerosene, or other like substance is used it should be cooked with the starch, to insure thorough mixing.

Thick starch:

½ cup starch, mixed with ½ cup cold water
1 quart boiling water
½ to 1 level tablespoon borax
¼ level tablespoonful lard or butter or kerosene or turpentine; or ¼-inch-square wax or paraffin
Mix, and cook as directed under directions for cooking starch.

Thin starch:

½ cup starch, mixed with ½ cup cold water
3 quarts boiling water
Other ingredients, same as for thick starch
Mix, cook as directed under directions for cooking starch.

Clear starch:

Dilute ½ cup thick starch with 1 quart hot water.
Clear starch is used for thin muslins, infants' dresses, etc.

Raw starch:

Same proportions as for thick starch.
Use borax but omit fatty substances.
Stir thoroughly before using.

Raw starch is often used with very thick or very thin goods, to increase their stiffness. A fabric will take up a greater amount of starch in the raw form than in the cooked form. The desired stiffness is produced by the cooking given the raw starch by the heat of the iron. The difficulty of ironing is increased by using raw starch, for unless the ironer is skillful the starch cooks on the iron and starch specks are then produced on the clothes. Moreover, raw starch gives a less durable finish than does cooked starch.

Rice starch:

¼ cup rice
1 quart boiling water
Wash rice, cook in water until very soft.
As water evaporates, add more to keep quantity up to 1 quart.
When cooked add another quart boiling water.
Strain, without squeezing, through double thickness cheesecloth or through flannel. Use while hot. The most satisfactory starch for delicate fabrics is rice starch, and it may be used in place of clear starch.

Glue for stiffening dark clothes:

12 ounces dark glue
1 quart water
Boil together until glue is dissolved, cool somewhat. Dip the garment to be stiffened into glue and wipe off excess of glue with piece of black cheesecloth, sateen, or calico. After sprinkling roll garment in black cloth and iron on ironing board covered with black cloth. Any glue left over may be saved and used again.

To increase stiffness:

1. Partly dry garment before starching.
2. Add 1 tablespoon powdered gum arabic reduced to liquid in ½ cup boiling water, to the stiff starch mixture.
3. Use borax.
4. Add a small amount of glue to starch mixture.
5. Dry quickly.

Gum arabic as a starch substitute:

4 tablespoons pulverized gum arabic
1 pint cold water
3 tablespoons alcohol

Put water and gum arabic in saucepan and set into saucepan containing boiling water.

When dissolved, strain through cheesecloth, cool, add alcohol, pour into a bottle, cork, set away for use. The alcohol acts as a preservative and the mixture may be kept for any length of time.

BLUING.

White fabrics have naturally a creamy tint, which may be deepened to an unpleasant pale yellow by careless washing, by insufficient rinsing, or by lack of exposure to the bleaching influence of sunlight and fresh air. Bluing is used to hide the yellow color, because blue and yellow are complementary colors and when used together in proper proportions give the effect of whiteness. Bluing is unwarrantably used to hide a yellowness which comes from careless washing.

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No one kind of bluing may be recommended to the housekeeper. She must experiment for herself, choose one good variety, and learn to use that one properly.

Sufficient bluing should be used to make a little of the bluing water taken up in the cup of the hand show a pale sky-blue color. More than that amount of bluing should not be needed. It is always best to make a small amount of strong bluing in a bowl of water, then draw from it to color the water in the tub.

TO REMOVE STAINS.

The ordinary washing process is sufficient to get rid of most of the dirt in clothing, but certain stains may require special treatment in order to insure their complete removal. Some stains are insoluble in water, or in soap and water, or they may be made so by the action of heat and thus become permanently set during the washing. It is wise always to look over clothing for such stains and to remove them before the washing begins. Such examination will often save time, and wear and tear on garments, even when it is possible to remove the stain in washing, as only the part of the

garment most affected is then treated and the removal of the stain does not involve severe treatment of the whole garment.

The process of removing stains is fundamentally the same as that of removing other forms of dirt, that is, to find some substance in which the stain is soluble or which will aid in its mechanical removal. The chief solvents valuable in removing stains that resist ordinary washing processes are:

Turpentine (inflammable)
Benzine, naphtha, or gasoline (inflammable)
Carbona
Kerosene (inflammable)
Ether (inflammable and an anaesthetic)
Chloroform (anaesthetic and a poison)
Alcohol (inflammable)
Olive oil, lard, etc.
Fuller's earth and french chalk.
Naphtha soaps
Water, both hot and cold
Oxalic acid (a poison)
Javelle water
Benzol
Hydrogen peroxid
Sunshine
Ammonia
Borax
Salt
Vinegar
Lemon juice
Hydrochloric acid (a strong acid very corrosive to fabrics and to flesh)
Ink eradicator
Milk

Method of Removing Stains.

Blood:

1. Wash in cold water until stain turns brown, then rub with naphtha soap and soak in warm water.
2. Rub with common soap, then soak in water to which a teaspoon of turpentine has been added.
3. If the goods is thick apply a paste of raw starch to the stain. Renew paste from time to time until stain disappears.

Chocolate:

Sprinkle with borax and soak in cold water.

Coffee:

Spread stained surface of the cloth over bowl or tub. Pour boiling water through the stained part of the cloth. Pour the water from a height so as to strike the stain with force.

Cream:

Wash in cold water, then with soap and water.

Fruit and wine stains:

1. Treat with boiling water as for coffee.
2. If the stain resists the boiling-water treatment, soak the stained part of the cloth for a few minutes in a solution made from equal parts of javelle water and boiling water. Rinse thoroughly with boiling water to which a little dilute ammonia water has been added. Repeat if necessary.

Grass stains:

1. Soak in alcohol.
2. Wash with naphtha soap and warm water.
3. If the fabric has no delicate colors and the stain is fresh, treat with ammonia water.
4. For colored fabrics, apply molasses or a paste of soap and cooking soda. Let stand over night.

Grease spots:

1. Wash thoroughly with naphtha soap and water.
2. Soften old grease spots with turpentine, oil, or lard before washing the cloth.
3. Dissolve the grease in benzine, alcohol, chloroform, ether, carbona, or benzol.
4. For delicate fabrics dissolve grease spots in ether or chloroform. Chloroform and carbona are useful because noninflammable.
5. Apply a paste of fuller's earth or chalk to absorb grease.

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Mildew:

Mildew is very difficult to remove if of long standing.

1. Wet stains with lemon juice and expose to sun.
2. Wet with paste made of one tablespoon of starch, juice of one lemon, soft soap, and salt, and expose to action of sun.
3. Treat with paste made of powdered chalk and expose to action of sun.

Mucus:

Soak in ammonia water or in salt and water, then wash with soap and cold water.

Perspiration:

1. Wash in soapsuds and expose to the action of sunshine.
2. Treat with javelle water as directed for iron rust.
3. Treat with oxalic acid as directed for iron rust.

Scorch:

Scorched fabrics can be restored if the threads are uninjured.

1. Wet the stained portion and expose to the action of the sun. Repeat several times.
2. Extract juice of two onions, add one cup vinegar, two ounces fuller's earth, and half an ounce soap. Boil. Spread paste over scorched surface. Let it dry in sun. Wash out thoroughly.

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WASHING.

While Monday has long been chosen as the home day for washing, there may be good reason to postpone the process until Tuesday. Before washing day, clothing should be thoroughly gone over to discover rents and stains, carefully sorted, and the white clothes put to soak. This preliminary work requires time which it may be

inconvenient to give on Saturday and which may not be justified on Sunday.

The following outline is suggested for the preparation of clothes for washing:

1. Sort the clothes according to kind:
   a. White cotton and linen clothing
      Table linen and clean towels
      Bed and body linen
      Handkerchiefs
      Soiled towels and cloths
   b. Colored clothing
   c. Flannels
2. Mend rents, except in stockings.
3. Remove stains.
4. Put as many white clothes to soak as is practicable. Some colored clothes having fast colors may be soaked if very much soiled.

The purpose of soaking soiled clothes before washing them is to soften and separate the fibers of cloth in order to loosen dirt. Water alone accomplishes this purpose to a great extent; but the use of a soap solution, or a soap solution to which has been added borax, ammonia, or other alkali, and turpentine, kerosene, or benzine, makes the washing process both easier and quicker.

It is well before beginning the washing to make a soap solution, as it gives a quick suds and is more easily handled, and its use will therefore save time.

All the clothing should not be put to soak in the same tub. If three tubs are available, soak table linen and clean towels in one, bed linen and body linen in a second, soiled towels and cloths in a third. If only two tubs are available, wash table linen and clean towels without preliminary soaking. Soiled towels and cloths should always be soaked before washing.

If colds have prevailed in a family, the handkerchiefs should be put to soak in a solution of boric acid in a basin by themselves, and should be separately washed and boiled for twenty minutes.

Wet the garment to be soaked, rub the more soiled part with soap solution, and fold that part in. Fold and roll each garment separately and pack it into the tub with the other garments. Folding and rolling prevents the dirt in the soiled parts from spreading. Cover the clothes with warm soapy water, to which may have been added an alkali such as borax or ammonia, and an oily substance, perhaps turpentine, kerosene, or benzine. Cover the tub, and if possible let the clothing soak in it during several hours or over night. If colored clothes are to be soaked, cover with warm water or with water very slightly soapy. No alkali should be used with the colored clothing.

No arbitrary order can be recommended for washing clothes,

but flannels, white goods, and colored goods should be washed separately as the washing process differs somewhat for each case.

A few simple explanations may aid the housekeeper in solving some of her problems. Heat tends to expand the threads of the cloth, and the expansion aids in removing dirt caught between the threads. If the cloth is cooled during the washing process, the thread contracts and the dirt is again entangled; consequently, after the cloth has once been warmed, one of the objects of the launderer should be to maintain an even or a rising temperature. In the commercial laundry an even temperature is kept by turning the right amount of steam into the washing machine. In the home laundry, boiling water added from time to time will aid in keeping an even temperature. A good suds is necessary in the washing process. As the suds falls, that is, as it is used up by uniting with dirt, more suds should be supplied by adding more soap or soap solution. If insufficient soap is used, insoluble black specks are often left on the clothing.

All utensils, receptacles, and apparatus should be immaculately clean.

Outline for Washing White Linen and Cotton Clothes.

1. Put water on to heat.
2. Make soap solution.
3. Rinse clothes from water in which they have soaked.
4. Wash clothes in warm suds in following order:
    a. Table linen and clean towels
    b. Bed linen
    c. Body linen
    d. Handkerchiefs
    e. Soiled towels and cloths
    f. Stockings.
5. Wash again in clean suds. Wring.
6. Boil in clean, slightly soapy water.
7. Rinse in clean, clear water. Wring.
8. Rinse in bluing water. Wring.
9. Starch.
10. Hang to dry.
11. Remove from line, dampen, and fold.

Directions for washing:

1. Have plenty of hot water before beginning the washing. If possible the water should be soft; if it not, soften it as directed.

2. Make a soap solution; use one cake of soap to two or three quarts of water.

3. Rinse the clothes from water in which they were soaked, removing as much of the dirt as possible. Parts of the clothing that are very much soiled should be rubbed a little and rinsed in fresh water before the garments are put into a tub or a washing machine. The precaution of rinsing saves wear and tear on the whole garment.

4. Pour warm water into tub or washing machine; if the water is hard, soften it with washing-soda solution or borax. Add enough soap solution or soap to make a good suds. A tablespoon of turpentine, kerosene, or benzine may be added to the washing water as well as to the water in which clothing has soaked. Put in clothes to be washed. Rubbing is essential for soiled garments. It may be accomplished in one of two ways: by using the washboard and old-fashioned tub, or by using a washing machine. It is well to have a board for very soiled parts, such as hems and edges, but the washing machine is a great improvement on the older method.

Whenever the water becomes dirty, use fresh suds. Clothes cannot be made clean without the use of plenty of water. Keep up a good suds while washing, and add hot water from time to time. If a washing machine is used, do not put enough water in the machine to float the clothes; if you should, they would escape the mechanical action of the dasher and would not be sufficiently rubbed. Clothes should be wrung from the wash water through the wringer. The screws of the wringer should be adjusted to bring its rolls close together and clothing should be folded so as to give it an even thickness in passing through the wringer, for heavier garments loosen the screws of the wringer. Fold in buttons and hooks and turn the wringer slowly.

5. A second suds is generally necessary, though it may be omitted if the clothing has been only slightly soiled. Shake out clothes wrung from the first suds, look them over for soiled parts, turn them wrong side out, and drop them into second suds. Wash and wring them ready for boiling.

6. Clothes should be clean before they are boiled, as the boiling process is intended not so much to remove visible dirt as to destroy germs and purify the clothing as well as to whiten it. Boiling is omitted when a naphtha soap is used, as the soap loses its effect in very hot water; it is asserted that boiling is not needed because naphtha itself is a purifier. Nevertheless, at least once a month, the clothing washed at other times with naphtha soap should be boiled.

Fill the boiler half full of cold water; if the water is hard, soften it. Add enough soap solution to make a light suds. Half fill the boiler with clothes, wrung and shaken out from the last suds. Use plenty of water and do not put too many clothes into the boiler. Bring the water very gradually to the boiling point and boil ten minutes.

Kerosene or turpentine is sometimes added to the boiler water to counteract the yellow color given clothing by the use of the dark resin soaps. It is better to avoid kerosene and turpentine at this point if possible, as clothing treated by them requires very thorough rinsing to remove the odor. Each boilerful of clothes should be started with clean cold water. Cloths or clothes containing lampblack or machine oil may be placed in the hot water left in the

boiler after the last clothes have been wrung from it. Kerosene or turpentine should then be added, as they are the solvents for such dirt.

7. Rinsing is an important part of the washing process, for if soap or some of the strong alkalis are left in the cloth, they may be very detrimental in the bluing or starching process.

If water is hard it should be softened for rinsing with either borax or ammonia and not with washing powder. The rinsing water should be hot. The clothes should be slowly lifted with a clean stick from the boiler into a dishpan, and drained or wrung and shaken before being put into the rinse water. It is not always practicable to use more than one rinse water before bluing the clothes, but better results are obtained when the clothes are rinsed more than once. With some kinds of bluing, the presence of soap or an alkali precipitates the blue as iron rust. If the starch used is not pure, and any lye or washing soda or soap has been left in the cloth, a yellow color is produced from the starch impurities by the action of those alkalis. Wring from the rinsing water and shake out the garments.

8. **Bluing.**—It is impossible to give any rule for the amount of bluing to use or the depth of color to be decided upon. Some fabrics, such as soft, loosely-woven fabrics, absorb more bluing than others. The amount of bluing to be used is a matter for experimentation by the launderer. Clothes should not be allowed to stand in the bluing water, as they might become streaked.

If a ball bluing is used, tie it in a thick cloth, wet, and squeeze it into a bowlful of hot water. Use a part of the resulting solution for bluing the water. More of the bluing in the bowl should be added to the bluing in the tub from time to time as the clothing takes it up. As some kinds of bluing are in the form of minute particles, the bluing water should be stirred each time before adding clothes to it. After they are wrung, unstarched clothes will then be ready for drying.

9. **Starching.**—Make the starch according to directions previously given. Starch those garments requiring thick starch first, as moisture from the clothing gradually thins the starch and a medium stiff, medium thin, and thin starch gradually result.

Stiff starch.—Collars, cuffs, shirt bosoms.

Medium stiff starch.—Shirt waists, collars and cuffs, coarse lace curtains.

Medium thin starch.—White petticoats, duck skirts, and some dresses.

Thin starch.—Skirts and dresses when a stiff finish is not desired; shirt waists.

Clear starch.—Infants' dresses, fine laces, curtains, light-weight table linen when it is desirable to give it some body.

Raw starch.—Collars, cuffs, shirt bosoms when an extra stiffness is desired; some light curtains.

The starch should be thoroughly worked into the cloth so as to distribute it evenly through the threads of the fabric. Such working insures a smooth, even stiffness and prevents starch spots in ironing. All garments starched with boiled starch should be dried thoroughly before being dampened. They should be dampened several hours before being ironed. If articles are to be raw-starched they should be thoroughly dried first. They are then dipped into the raw starch and rubbed as for washing, squeezed dry, and spread out on a clean sheet or cloth, but not one over the other. They should cover only half the sheet. The other half of the sheet should be folded over them. Then the sheet with its contents should be rolled tightly and allowed to stand for two or three hours to insure even distribution of moisture.

10. **Drying.**—When possible the process of drying should accomplish more than the mere removal of moisture. Clothing should be hung where it will be freely exposed to the action of fresh air and sunshine. Such exposure purifies and bleaches at the same time. In many commercial laundries a chemical bleach is used to whiten clothing that is necessarily dried in steam closets, and consequently does not have the beneficial bleaching action of sunshine. The home launderer does not often have to consider the need for commercial bleaching agents.

The launderer should be provided with a clothespin bag or, better still, with a clothspin apron having a deep wide pocket.

When possible, lines should be taken down each week, but when they cannot be they should be well wiped with a damp cloth before hanging up clothes. The clothspins should be clean. Each article should be turned wrong side out and hung with the threads of the material straight; the garment should be shaped as nearly as possible in its natural shape. Avoid hanging pieces by corners, for thus hung they would be pulled out of shape. Fasten garments by they bands when possible. Table linen, bed linen, and towels should be well stretched and hung very straight; the larger pieces should be pinned in at least four places, as it is nearly impossible to iron properly a piece that was improperly hung. Careful hanging greatly reduces the labor of ironing. When the clothes are brought in from the line the clothespins should be put into the apron or basket kept for that purpose and placed where they will be kept clean.

Starched pieces should not be allowed to freeze and should be removed from the line as soon as dry. Long hanging reduces their stiffness. If flannel underwear is properly stretched and hung it may be folded and put away without further treatment.

11. **Dampening.**—Clothes should be dampened some hours before being ironed, because during the interval between moistening and ironing the moisture becomes distributed evenly and does away with the necessity of using a superfluous amount of water. The dampening is best done at night, but only as many articles should be sprinkled as can be ironed next day, for damp fabric will mildew

if left wet for a few days, especially in hot weather. Although clothes should be well dampened, they should not be drenched. Very often, trouble in ironing starched pieces is owing to overwetting. The starched part is soaked and made limp and sticky. A clean whisk broom kept for the purpose is the best thing to use for sprinkling clothes. Some persons have used a toy sprinkling pot. There is, however, a danger in its use, for it may rust and give rise to rust spots on clothing. Large pieces should be sprinkled and folded separately. Small pieces may be sprinkled and laid together before folding. Care should be taken to fold and roll garments smoothly, as this aids in their ironing. The rolls of dampened pieces should be packed closely in a basket lined with a clean cloth and covered with a clean cloth.

Table linen and other linen should be made very damp, not wet. If table linen is sprinkled with a mixture of one part alcohol and four parts water, the result after ironing will be a slight stiffness resembling that of new linen.

If an ironing machine is used, unstarched pieces may be removed from the line while still damp and ironed immediately without the preliminary sprinkling.

Washing Colored Clothing.

The processes of dyeing have so improved that almost all wash goods are now considered to have fast colors. This is particularly true of the better grades of fabrics, in which the dye seems to attach itself with especial firmness to the fibers of the cloth. Though a a color may be said to be fast, it is only relatively fast. Colored goods require more careful treatment than do white goods. The conditions that most affect the stability of colors in fabrics are: long-continued action of water and soap; strong alkalis or acids; strong sunlight, which is a powerful bleaching agent and is used frequently for bleaching.

In washing colored clothing, the factors just enumerated should be kept in mind. Colored clothing should not be soaked for any length of time unless its color is known to be very stable. Any soap used in the washing process should be a mild soap in solution, or if the color of the goods to be washed is very delicate the soap solution should be replaced by soap bark, bran, rice water, potato water, or cooked-starch water. The washing process should be conducted quickly, and in water not very hot. After washing, colored garments should be turned inside out and hung in a very shady or dark place, and should be taken in as soon as dry. Fading is more often owing to careless drying than to any fault in washing. Washing powders and strong alkalis should never be used with colored clothing. If the water needs softening, use borax. If starch, bran, rice water, etc., are substituted for soap, use the mixture as if it were soapsuds.

In starching colored clothes, rub the starch in thoroughly and wipe off any excess of it; no difficulty will then be experienced with white starch spots.

To set color.—Sometimes a fabric shows a decided tendency to fade even under the best washing conditions. It is always well if there is any doubt about fading to test a small piece of the cloth before washing it. If the color fades, then an attempt should be made to set it. With most colors, the dyer uses chemical substances which cause a firmer union between the color and the cloth. Such substances are called mordants. The process of making a color fast may sometimes satisfactorily be used by the housekeeper to strengthen weak colors. The household mordants are brine, vinegar, sugar of lead, and alum, used in the following proportions:

To 1 gallon water add
½ cup mild vinegar, or
2 cups salt, or
1 tablespoon alum, or
1 tablespoon sugar of lead (poison)

Vinegar is best for pinks. Small pieces of cloth should be tested in each of the above solutions and a choice made after the test. The cloth of which the color is to be made fast should be left in the mordant solution over night and may be left in for several days with good results. It should be thoroughly dried before being washed. Even with relatively strong colors, soaking a fabric over night in a brine solution before washing it for the first time may render it far less susceptible to fading influences than it otherwise would be. The effect of brine, however, is said not to be lasting. Colored goods are often rinsed in a dilute salt solution just before drying them.

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BLEACHING.

In former times, dependence was placed on sunshine, fresh air, and a green sward for bleaching all manufactured cottons and linens. Such dependence on natural agents has been obviated by the ability to procure similar results from the use of chemicals.

In the home laundry, we still use natural agents to whiten and purify household linen. That is the greatest advantage which the home laundry has over the commercial laundry; in the latter, in a majority of cases, clothes are dried in steam closets, and some chemical must replace the sun's rays to bleach a garment left yellow by washing. The action of the sun and air is not merely to bleach but to disinfect, and clothes thus dried have a freshness and sweetness that cannot be duplicated by any other method.

Occasionally, even in the household, it may be necessary to supplement the natural bleaching process by the use of chemicals.

If a garment has yellowed by age or by being packed away with starch in it, it may be expedient to use a chemical bleach.

The best bleach to use is javelle water, which should be made as follows:

1 pound washing soda
½ pound chlorid of lime
1 quart boiling water
2 quarts cold water

Put soda in granite pan; add boiling water and stir until dissolved; let cool.

Dissolve chlorid of lime in cold water; let settle and pour the clear liquid into the soda; let settle. Pour off clear liquid, bottle, and put away in dark place.

Use, mixed with equal parts or more of water, and do not let the garments stay in over ½ hour. Rinse thoroughly in several waters and lastly in dilute ammonia water.

Moisture is necessary if clothes are to be bleached by the action of the sun. After a garment dries, it should be made wet again and hung out. It may be necessary to repeat the wetting operation a number of times before the yellow tinge yields. It is said that clothes are whitened if they are allowed to freeze out of doors on the line. The reason given for the bleaching action is that freezing causes the clothes to retain moisture, hence the time of their bleaching is prolonged.

IRONING.

While a knowledge of conditions aids greatly in ironing as in other operations, experience and skill are necessary to accomplish good results. Ease of ironing and the quality of the product depend on the skill of the operator, on the care that has been used in starching, drying, sprinkling, and folding the clothes to be ironed, and on the kind and condition of the irons. If the garments have been poorly and carelessly starched, the work of ironing is greatly increased. Starchy lumps cook on the iron and damage its smoothness, even when the lumps are immediately removed. The reason for allowing clothes to stand over night after sprinkling is to give them an even dampness that makes ironing easy and successful. If starched goods have been over-dampened, the starch is brought to the surface and a result is produced similar to that of careless starching. If linen is too dry it cannot be made smooth and free from wrinkles. If it is too wet, the process of ironing is laborious.

It is said that irons that are to be used for starched garments should not be polished by rubbing them on salt or emery paper. A better method is to procure a good yellow pine board, free from all sand and dirt, and rub it with a hot iron until a hard coat of burned resin is produced. The board may be used for polishing the iron. The iron should occasionally be wiped with a piece of wax or paraffin and then with a clean cloth.

Have ready and at hand: a flat, firm, unwarped ironing board or table, tightly covered with a blanket and clean sheet, securely fastened underneath; clean irons; an iron stand, which may well consist of a clean brick; two pieces of old cloth for cleaning irons; a piece of paper folded several times for testing irons; a piece of beeswax or paraffin tied in a cloth, for keeping irons smooth; a bowl of water and a clean cloth for moistening parts dried by exposure to air. Spread a large paper or place a basket under the ironing board to receive the clothes while they are being ironed.

For ordinary ironing a good firm surface is desirable. A thin woolen blanket and an outside linen cover are sufficient. For embroideries or wool, a thick covering is better, as the fabric should sink into a soft foundation to bring out the pattern in one case and to give a soft finish in the other.

The following simple rules for ironing may be followed:

Iron first that part of the garment which will be least mussed by further handling or in which a little wrinkling will not seriously interfere with good results.

If the garment is trimmed, iron laces and embroideries first, as they dry out quickly because of their porous nature.

Leave as much of a garment folded as possible, to keep it moist. Sometimes it may be convenient to lay a piece of dampened cheesecloth over any unironed part to keep it moist.

Method and Order for Ironing.

Night dresses:

1. Embroidery; 2, sleeves; 3, yoke; 4, body.

Drawers:

1, Trimming; 2, tucks; 3, body; 4, band.

Skirt:

1, Ruffle; 2, hem; 3, body.

Shirt waists:

1, Cuffs; 2, collar band; 3, sleeves; 4, yoke; 5, back; 6, front.

Silk waist:

Iron as above on wrong side while still damp.

Embroideries:

Iron on wrong side on soft foundation, to allow design to stand out.

Laces:

Lay on piece of flannel covered with a piece of cheesecloth. Iron on wrong side and pull out points with tip of iron. Lace should be stretched and pinned out on a hard surface. Pull out at each point and catch down with a pin; or stretch and roll on a bottle.

Tablecloths:

Use heavy irons, iron on both sides, iron partly dry on wrong side and complete process on right side, to bring out pattern. Fold selvages together first. Fold all edges evenly, except when folding the lengthwise folds in half. Draw upper half back about one-half inch in making the last fold, or that part will be pushed out of place, giving an uneven edge. The same rule applies to sheets, napkins, handkerchiefs, etc. Tablecloths may be folded lengthwise twice and then rolled to avoid creases.

Napkins, handkerchiefs, and towels:

Iron and fold as for tablecloths.

Sheets:

The hems of sheets must be smoothly ironed. It is a good plan to iron only that part of the sheet when time is a consideration.

Flannels:

Iron after laying a dampened cheesecloth over them. If they are not covered with a damp cloth, iron on wrong side; have the iron only moderately hot.

Pillow cases:

Iron smooth.

Colored garments:

Iron on wrong side, as to do so prevents fading. Do not have irons too hot.

Silk garments:

Iron on wrong side; to do so prevents shininess.

After ironing, each article should be hung on a frame or clothes-horse to dry and air before it is put away. If hung in a poorly ventilated room the clothes will have a bad odor.

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Irons.—A number of irons are now on the market for summer use when it is not desirable to have sufficient fire in the range to heat the irons. Some of these are: electric irons, gas irons, and, most practical of all for the country home, denatured-alcohol irons.

For general laundry purposes one size of the ordinary sadiron is sufficient, but it is advisable to put several irons into a well-equipped laundry, to use for the various kinds of work to be done. Among them should be heavy, medium, and small-pointed irons, the last for ironing ruffles, laces, etc.

A frequent cause of poor ironing is the condition of the irons They must be kept clean and free from rust to do good work. New irons should be heated thoroughly and rubbed with wax or

grease before using. If irons are to be put away for any length of time they should be covered with a thin coating of vaseline, clean grease, or paraffin, or wrapped in waxed paper. If starch cooks on, it should be removed immediately with a dull knife. If irons become dirty from careless use, or from being left on the stove during the preparation of the meals, they should be thoroughly washed with soap and water and carefully dried. To keep irons smooth while using them, rub with wax or paraffin and wipe immediately with a clean cloth. They improve with wear, if they have good treatment.

Tubs.—Although a washing machine may be used, there should be one or more tubs in a laundry. Stationary tubs are best, even though running water is not available, for some simple method of draining them can be devised. The tubs are better made of porcelain, enameled iron, or alberine stone. Wooden tubs may be more cheaply constructed; but there is danger of the wooden tub becoming unsanitary from careless handling.

A stationary tub should always be set with regard to the height of the person who is to use it most. Many tubs are set far too low and necessitate too much back bending on the part of the operator.

If stationary tubs are not available, fiber tubs are the best to buy for the laundry, as they are light and easy to care for. Galvanized iron and wooden tubs are cheaper.

Laundry bench.—The laundry bench for holding tubs should be of the proper height. Most such benches are far too low, involving effort out of proportion to the task to be accomplished.

Wringer.—A wringer should be a part of the laundry equipment, and the best on the market is always the cheapest. After using a wringer, it should be carefully dried and the screws pressing the rollers should be loosened. When not in use it should be kept covered with a cloth to protect it from dust and dirt. The bearings should be oiled occasionally. Oil dissolves rubber, and that property of oil is taken advantage of in cleaning the rubber rollers. They are carefully wiped with a little kerosene which eats away a thin film of the rubber, exposing a fresh surface. The operation should not be performed frequently, however, and the oil should be carefully and completely removed immediately after its use.

Ironing board.—An ironing board, which has its broader end attached by hinges to the wall, is a great convenience, for then it is always in place and can be put out of the way by folding up against the wall.

Ironing blanket.—The ironing blanket and sheet should be put on smoothly and tacked securely under the board, using short brass-headed tacks. It is a good plan to have a separate blanket and sheet also, which fit the table used in the laundry, as a table is

a convenient place for ironing large pieces. The ironing sheet should be kept clean.

Sleeve board.—A sleeve board is good not only for sleeves, but for gathers and for small dresses. It is not difficult to manufacture at home.

Character of utensils.—As far as possible, all utensils that are to come in contact with clothing or to contain material to be used on clothing, should be nonrustable. Tinware is not good for laundry use because of the ease with which it rusts. The boiler should have a copper bottom at least, and is best made entirely of copper. It then conducts heat better and does not rust.

Further supplies:

Rubbing board
Wooden spoon
Dipper
Dishpan, enamel
Tea kettle
Measuring cup
Quart measure
Iron holder
Teaspoon
Clothes basket
Strainer for starch
Beeswax or paraffin wrapped in cloths to keep irons smooth.
Laundry bags
Clothes stick
Pail, enamel or fiber, for emptying water and carrying clothes
2 saucepans, enamel, one for starch and one for soap solution
Iron stand
Tablespoon
Case knife
Clotheshorse
Scrubbing brushes
Clothespin aprons, best made of ticking
Clothespins

—*Extract, Vol. I, No. II, Farm Home Series No. 3, New York Agricultural College, Cornell University.*

Cost of Food

Flora Rose.

KNOWLEDGE NECESSARY TO INSURE PROPER PLANNING OF THE DIETARY.

The ability to purchase foods wisely and well, to plan meals that shall be at once gratifying, satisfying, and fundamentally right does not come by instinct nor is it to be acquired in a moment. Like any good piece of work, it requires time and study, thought and effort, to make it successful. The following outline of body needs and food functions is intended to indicate only in the briefest way some of the food problems that the housekeeper faces, and to show one method of judging the value of the food that is so important a part of family welfare. Without a little of this knowledge the housekeeper is really groping blindly.

The Human Machine.

The human body is a living machine whose purpose it is to transform one kind of energy into another kind. The main part of the food that goes into the body machine each day should be of a sort that will yield energy. One of our needs is to find food which will supply that energy at the least cost and in a form which will give the best service. It is the same old problem that we have had before us in dealing with the cost of running the cookstove, furnace, or steam engine; but now the problem has its human application.

Best fuels for the body.—The substances which are cheapest and which give best service to the body as fuels—that is, as energy yielders—are the sugars, starches, and fats. Therefore, foods such as cereals or cereal products, legumes, potatoes, butter, fat meats, oils, must occupy a prominent place in the family dietary.

Body-building substances.—The human machine, like other machines, requires various materials for repairing it and building it up. The main building material of the living tissue of the body is the substance known as protein. Lean meat, white of egg, casein of milk, gluten of wheat, are all typical protein substances. Other materials are also required for body building and body welfare, and must not be neglected when the cost of food and its uses in the body are being considered. Bones, muscles, and nerves all need lime and phosphorus, red blood must be supplied with iron. Sodium, chlorin, magnesium, potassium, and a number of other substances of less defined use, are all necessary not only to the welfare of the body but to its ability to continue its existence. Their cost must also be reckoned in the purchase of food.

How Foods May Be Compared as to Real Cost.

If, then, the cost of food is to be judged, the specific food needs of the body must first be determined, then the various foods must be compared as to their ability to satisfy each of those needs.

The trained housekeeper will soon begin to ask herself which foods are cheapest as a source of energy, and which as a source of protein, iron, lime, or some one of the other substances needed by the body. The cost per pound will finally take its right place in her mind as something with which to reckon, but not as something by which to be overwhelmed. She will find that a food which is a decidedly expensive source of energy may on analysis prove an indispensable source of iron or of lime; that a food which is an expensive source of protein may be exceedingly cheap as a source of energy; or that a food which seems expensive as a source of both protein and energy is still a cheap food because of its supply of iron or lime or phosphorus. And so she will test each food and make her final choice on an intelligent basis.

The unit of measure for determining the energy requirement of the body.—Just as there must be some unit of measure for weight, for distance, for temperature, for cubical contents, for money, so there must be some unit of measure for energy or heat. The pound, the yard, the square inch, the degree, the dollar, are so familiar to us that we never question what they mean or how they were obtained. We have always been accustomed to seeing solids weighed and distances measured. We have learned to translate values in terms of dollars and cents. Our experience even gives us some fairly accurate idea of what is meant when we say that the thermometer stands at 32° or 100° F. The unit of measure for energy, or heat, which is called a "calorie," has not been in the past a part of our education; but it is to be important in the future if we are to provide best conditions for human welfare.

In any large factory where many engines are in use and furnaces must be kept going night and day, the energy value of fuel consumed is of great importance. Just as the grocer must know how many pounds or bushels or tons are being delivered to him, so the manufacturer must know how much energy—that is, how many heat units, or calories—the fuel that he is buying is capable of giving him. He, like the grocer, cannot afford to pay for short measure.

Daily food requirement.—The human body, like the machine, is a spender of energy. We must learn what amount of energy—which we measure by calories, or heat units—the body spends every day under different conditions of age and activity; and we must determine the amount of energy that the various common foods are capable of giving to the body, and then compare the various foods in terms of the calories that they are capable of yielding. We must find out how much building material, in the form of protein, the

Table 1. A Method of Estimating the Food Requirement of Young to Middle-Aged Men and Women.

Energy requirement	Protein requirement		Partial mineral requirement				
	Protein required for each pound body weight		Total average daily mineral requirement; Calcium, phosphorus, iron, magnesium, potassium				
Energy required for each pound body weight	Amount favored by those believing in low-protein diet (ounces)	Amount favored by those believing in high-protein diet (ounces)	Calcium calculated as Lime (CaO) (ounces)	Phosphorus calculated as Phosphoric acid (P_2O_5) (ounces)	Iron calculated as Iron (Fe) (ounces)	Magnesium calculated as Magnesia (MgO) (ounces)	Potassium calculated as Potash (K_2O) (ounces)
For a person:							
1. At complete rest, 14 to 16 calories	.0118 to .0128	.0153 to .018	.0333 to .05	.0916 to .1	.0005 to .0006	Not determined	
2. With light work, 16 to 18 calories	.0128 to .0147	.018 to .0206					
3. With moderate work, 18 to 20 calories	.0147 to .0165	.0206 to .023					
4. With hard work, 20 to 23 calories	.0165 to .0185	.023 to .026					

A man of average weight — about 154 pounds — would require in one day a total of

Energy (In terms of calories, or heat units	Protein		Calcium calculated as Lime (CaO) (ounces)	Phosphorus calculated as Phosphoric acid (P_2O_5) (ounces)	Iron calculated as Iron (Fe) (ounces)	Magnesium calculated as Magnesia (MgO) (ounces)	Potassium calculated as Potash (K_2O) (ounces)
	For low-protein diet (ounces)	For high-protein diet (ounces)					
1. At complete rest, 2,100 to 2,450 calories	1.83 to 2	2.33 to 2.83	.0333 to .05	.0916 to .1	.0005 to .0006	Not determined	
2. With light work, 2,450 to 2,800 calories	2 to 2.26	2.83 to 3.16					
3. With moderate work, 2,800 to 3,150 calories	2.26 to 2.53	3.16 to 3.50					
4. With hard work, 3,150 to 3,500 calories	2.53 to 2.83	3.50 to 4.03					

body needs each day and how much and at what cost our various foods can supply protein. We must find out how much lime, iron, phosphorus, magnesium, and potassium are needed, and how the common foods compare as sources of those substances. Finally, we must stop and consider all the data accumulated and learn whether the energy, protein, calcium, and other material furnished by one food, even at a lower cost than by another, are of as good a type and as available to the body as those supplied by that other. Then, and only then, have we a real basis for comparing the cost of foods. Then only do we begin to develop a philosophy of the right and economical nutrition of those for whom we must care.

Table for estimating food requirements.—The following table, like any table of the kind, is only a guide, or indication, as to the food requirements of the body as these are understood today. While it cannot be followed inflexibly, it should at least serve a useful purpose in giving an idea of the amounts of some of the typical food substances needed, and will form a basis for comparing the values of various foods in supplying those needs. (See page 130.)

Table for comparing the cost of various foods.—In comparing the cost of energy as supplied by various foods, two points of view have been adopted: first, the cost of sufficient food to furnish 3,000 calories, the amount of energy required daily by the average man at moderate muscular work; second, the amount of energy that various foods can furnish for ten cents. The price assumed for some of the foods is necessarily arbitrary, since prices will vary from day to day and from place to place. In comparing the cost of the various nutrients supplied by foods, the ten-cent basis has been used. The following table (page 132) should prove of great value to the housekeeper desiring to feed her family in a progressive way. While it has not been possible to include a wide variety of foods, an effort has been made to choose those that are typical. The housekeeper can thus group, under the types given, foods that are not included.

One soon learns from such study of foods that the really cheap sources of energy are cereals. Here also, however, a study of our table will show us marked differences among various types. It is very interesting to compare the energy cost of two cereal foods such as oatmeal or corn meal, with a ready-to-eat cereal food such as shredded wheat, and find that shredded wheat is really expensive as a source of energy—as expensive, in fact, as whole milk at six cents a quart—and is more expensive than whole milk at six cents a quart as a source of protein. From the energy and protein standpoint, corn meal is an exceedingly cheap food; but as we look further we find that it is an expensive source of lime, iron, and potassium. Whole milk, even at ten cents a quart, is a cheap source of lime, while skimmed milk or buttermilk is very cheap as a source of lime and phosphorus. From a study of the table, eggs seem to be a comparatively expensive form of most nutrients, except iron.

Table 2. Method of Comparing the Cost of Some Common Foods as Sources of (A) Energy, (B) Protein, (C) Calcium, Iron, Phosphorus, Magnesium, and Potassium.

Food	Cost		Amount to be purchased for ten cents						
	Per Pound	Per 3,000 Calories	Calories	Protein (ounces)	Calcium calculated as Lime (CaO) (ounces)	Iron calculated as (Iron Fe) (ounces)	Phosphorus calculated as Phosphoric acid (P_2O_5) (ounces)	Magnesium calculated as Magnesia (MgO) (ounces)	Potassium calculated as Potash (K_2O) (ounces)
Oatmeal	$0.06	$0.099	3,018	4.27	.03	.009	.217	.052	.113
Corn meal	.03	.055	5,400	4.90	.0072	.0005	.144	.0648	.09
Shredded wheat	.15	.27	1,106	1.10	Not determined				
Bread (white)	.06	.15	1,998	2.41	.0073	.00019	.0499	.0073	.0266
Bread (graham)	.06	.15	1,981	2.36	.0125	.00085	.1253	.....	.....
Rice	.10	.185	1,620	1.28	.0016	.00016	.0307	.0070	.0124
Potatoes	.02	.198	1,510	1.44	.0095	.00075	.0835	.0211	.3170
Beans (dried)	.10	.19	1,565	3.60	.0328	.0010	.1700	.0375	.2091
Beans (lima)	.10	.19	1,586	2.89	.0148	.0010	.1157	.0459	.3119
Almonds	.80	.816	367	.41	.0056	.00003	.0161	.0064	.0036
Walnuts	.40	.377	795	.73	.0039	.00007	.0286	.0087	.0161
Milk (.06)	.03	.286	1,046	1.40	.0833	.00011	.1056	.0094	.0847
Milk (.08)	.04	.38	785	1.32	.0632	.00008	.0792	.0070	.0635
Milk (.10)	.05	.477	628	1.05	.0500	.00007	.0634	.0056	.5086
Milk (skimmed or butter)	.02	.359	835	2.40	.1155	.....	.1697	.0200	.1377
Cheese (full cream)	.20	.317	945	2.07	.0787	.....	.1036	.0044	.0157
Eggs	.14	.707	424	1.35	.0084	.00026	.0339	.0012	.0152
Eggs	.24	1.21	247	.77	.0049	.00015	.0197	.0007	.0088
Beef roast (chuck)	.10	.376	797	2.52	.0023	.00085	.1115	.0079	.0929
Beef (plate lean)	.12	.415	722	1.72	.0021	.00077	.1010	.0072	.0842
Beef (round lean)	.20	.86	324	1.56	.0009	.00034	.0453	.0032	.0378
Oranges	.06	1.06	281	.21	.0103	.00005	.0084	.0037	.0393
Prunes	.18	.50	644	.15	.0042	.00019	.0171	.0064	.0856
String beans	.15	2.55	177	.22	.0069	.00014	.0110	.0060	.0391
Cabbage	.05	1.239	242	.44	.0172	.00028	.0225	.0065	.1149
Chocolate	.35	.38	790	.57	.0052	.....	.0368	.021	.....
Bacon	.20	.25	1,420	.75	.00004	.00009	.0189	.0014	.....
Butter	.34	.29	1,026	.04	.0010	.....	.0013	.00003	.0010
Sugar	.06	.09	3,025	....	.....	.....	.....	.....	.....

Here, however, is where even further knowledge of foods is necessary; for, while eggs are expensive, the protein, iron, and phosphorus contained in them are of a kind that is considered to be unusually available to the body, whereas the iron and phosphorus in such a food as meat are not believed to be so completely used by the body.

Comparative cost of edible material in foods.—Many persons do not realize the importance of considering the proportion of edible material when purchasing foods. This is particularly true in the case of meat. Rump, round, beef loaf, a piece of neck or chuck, is just as nutritious as porterhouse or tenderloin and may be made as palatable. Not only may the cheaper cuts of meat be as nutritious and as palatable as the more expensive ones, but they may often be found to be less wasteful as well. A cheap piece of meat may not prove cheap in the end, however, if we pay for bone instead of for edible material.

The Journal of Home Economics for October, 1910, reports an experiment made to show the relative cost of several much-used cuts of meat. The following table is adapted from that report:

Kind of meat	Cost per pound as purchased (cents)	Percentage of edible meat	Cost per pound of cooked meat obtained after deducting waste and loss (cents)
Beef loaf	15	72	20
Round (braised)	15	61	24
Short ribs (boiled)	10	36	27
Rib roast	15	41	37
Porterhouse roast	25	41	62

Another interesting experiment is reported, which shows the relatively high price that is paid for such a food as chicken. This is because of the large amount of waste.

Cost per pound live weight	Weight		Edible meat cooked (pounds)	Cost of cooked meat per pound (cents)
	Live (pounds)	Dressed (pounds)		
16 cents	4.65	4.09	1.11	74

The housekeeper should conduct her own experiment station and make experiments such as the above. She may thus soon find herself able to rightly estimate values.

* * * * * * *

—*Extract, Vol. II, No. 29, Food Series No. 7, New York State College of Agriculture.*

How to Apply Dietary Standards

Suppose that a family of four persons desiring to be governed by the Langworthy Dietary Standard, should select from the tables for their daily menu, the following:

Oatmeal, milk, lamb-chops, roast beef, sugar, eggs, Irish potatoes, sweet potatoes, rice, bread, cake, bananas, tea and coffee. Suppose the four adults are men and each engaged in moderate muscular work. From the foods selected on the menu result would show the following protein content and fuel value:

Menu of Family of Four Adults for One Day.

(Langworthy's Standard: Man at Moderate Muscular Work.

Food Materials—	—Weight—		Protein,	Fuel Value
	Lbs.	Ozs.	Lbs.	Cals.
Breakfast.				
Oatmeal:				
Oatmeal	..	8	0.081	904
Milk	..	6	.012	117
Sugar	..	3	....	340
Lamb Chops (from leg)	1	8	.240	1,629
Bread	..	8	.046	592
Butter	..	2	.001	431
*Coffee	..	..	.010	381
Total			.390	4,394
Dinner.				
Roast Beef (chuck)	1	12	.277	1,384
Potatoes	1	..	.013	303
Sweet Potatoes	..	12	.011	335
Bread	..	6	.035	444
Butter	..	2	.001	431
Rice Pudding:				
Rice	..	4	.020	398
Eggs	..	4	.033	153
Milk	..	6	.012	117
Sugar	..	3	.....	340
Tea	..	..	.010	381
Total			.417	4,286
Supper.				
Bread	..	12	.069	887
Butter	..	3	.002	647
Bananas	..	12	.006	218
Cake	..	8	.032	813
Total			.109	2,565
Total for three meals			.916	11,245
Average for one person			.229	2,811

APPLICATION OF DIETARY STANDARD.

In the table it is seen that .28 pound protein with carbyhydrates and fats sufficient to yield a fuel value 3,400 calories for a day's menu for moderate muscular work, and as the quantity supplied in the foregoing table is not sufficient to produce the caloric value content, it becomes necessary to add to the following list of foods already supplied.

Foods are as follows:

	Wt. Ozs.	Protein Pound	Full Caloric Value.
Cheese	4	0.065	469
Beans	10	.141	976
Pork	4	.005	879
		.211	2,324

Total amount added to menu:

	Protein, Lb	Caloric Value.
Quantity content already supplied equals	.916	11,245

Which is insufficient food content for a man of heavy muscular work, therefore,

	Protein Lb.	Caloric Value.
	.916	11,245
Plus food supplied	.211	2,324
	1.127	13,569

equivalent quantity for four persons.

For one person one-fourth of food content as given in illustration above:

Day's Ration for One Man—

.282 lb. Protein
3,392 Calories

Above is the food nutriments which furnish the desired amount required for the Standard of Dietic Food Table, or is near enough to make a sufficiency without being absolutely exact.

—*Extract, National Food Magazine.*

Economical Balanced Ration

Menus.

Menus must consist of varieties of food suitable for the month in which they are compiled or written.

This is the way the housekeeper can show how food can be combined in a scientific, palatable manner and bring out the full value of foods, both in a commercial, as well as the caloric value, and demonstrate beyond all cavil that the science of cooking is profitable as well as pleasant.

REV. MYERS' CHURCH.		HOTEL LA SALLE.	
Beef Bouillon	$ .01	Bouillon au Barley	$0.25
Roast Lamb (gravy, ½c)	.04½	Roast Lamb, entree and Brown Potatoes	1.25
Browned Potatoes	.01½	Rutabagas	.40
Mashed Rutabagas	.01	Biscuits	.35
Baked Apples	.01	Baked Apples	.50
Bread	.02	Coffee	.25
Oleomargarine	.01		
Coffee	.01½	Total	$3.00
Total cost to church	$0.13½		
Sold to guests at	.15		

—Extract, National Food Magazine.

First Prize Menu

ECONOMICAL BALANCED MEALS

For One Week in June for Four Adults, Three in Office Work, One Housekeeper

MATERIALS FOR ONE WEEK COST $10.00 (NEW YORK PRICES).

Raspberries 1½ quarts
Strawberries, 3 quarts.
Pineapple, 1 fresh.
Bananas, 8.
Lemons, 9.
Lemons, 9.
Dates ¼ lb.
Rhubarb, 1 lb.
Cherries, ½ lb.
Cherries (Stewing) 1 lb.
Tomatoes, 1½ lbs.
Lettuce, 3 heads.
Asparagus, 4 bunches.
Spinach, 1½ lbs.
Corn, 1 can.
Carrots, 1¾ lbs.
Onions, 1 lb.
Green Beans, ¾ lb.
Radishes, 1 bunch.
Mint, 1 small bunch.
Parsley, 1 bunch.
Celery, 1 head.
Peas, 1½ lbs.
Potatoes, 10 lbs.
Rice, ½ lb.
Sweet Red Pepper, 1.
Tapioca, ¼ cup.
Macaroni, ¼ l.
Eggs, 2 doz.
Chicken, 4 lbs.
Lamb, 5 lbs.
Halibut, 2 lbs.
Bacon, 1½ lbs.
Salt Pork, ½ lb.
Salmon, 1 small can.
Steak, 1½ lbs.
Cheese, ½ lb.
Crackers, ½ lb.
Bread, 6 loaves.
Flour, 3½ lbs.
Graham Flour, 1 cup.
Cereal, 1½ cups.
Corn Flakes, 2 cups.
Coffee, 1 lb.
Tea, 4 oz.
Chocolate, 2 oz.
Butter, 2 lbs.
Butterine, 1 lb.
Crisco, ¼ can.
Cream, 4 pts.
Milk, 7 qts.
Gelatine, 1 tablespoon.
Sugar, 6 lbs.
Flavoring, 4 teaspoons.
Baking Powder, 1 oz.
Salt, 6 oz.
Rock salt, 2 lbs.
Pepper, 1 oz.
Oil, ½ pt.
Vinegar, ¼ pt.

The numerals attached to the menu for Sunday refer to the properties of the food used as indicated in the following:

1.—Food rich in proteid.
2.—Food rich in fats.
3.—Food mostly liquid.
4.—Food for bulk.
5.—Food largely sweet.
6.—Food mostly starch.

Materials Used

Sunday

BREAKFAST
Raspberries,[3] Sugar[5] and Cream[2]
Salmon Fritters[1]
Twin Mountain Muffins[1]
Coffee

SUPPER
Creamed Eggs,[2] Lettuce,[4] Sandwiches[4]
Chocolate Layer Cake[6]
Lemonade[3]

DINNER
Celery Bouillon[6]
Roast Chicken[1] Giblet Gravy[2]
Mashed Potatoes[6] Young Carrots[4]
Asparagus[4] on Toast[6] with Melted Butter[2]
Strawberries[3] and Cream[2] or Strawberry
Ice Cream[2]
Black Coffee[3]

Monday

BREAKFAST
Baked Bananas
Cooked Cereal with Sugar and Cream
Toast Coffee

LUNCHEON
Asparagus in Crusts
Dutch Cheese and Chopped Nuts
Raspberry Tapioca Pudding

DINNER
Cream of Corn Soup
Cold Roast Chicken Lettuce Garnish
Rice with Pimento String Beans
Snow Pudding, Lemon Sauce

Tuesday

BREAKFAST
Cherries on the Stem
Corn Flakes, Sugar and Cream
Broiled Bacon One Egg Muffins
Coffee

LUNCHEON
Chicken Broth Flecked with Parsley
Rice and Pimento, Baked with Cheese
Snow Pudding
Strawberry Sauce

DINNER
Round Steak with Brown Gravy,
Tomato Catsup
Potato Puff Boiled Onions
Lettuce and Radish Salad, French Dressing
Chocolate Layer Cake
Pineapple

Wednesday

BREAKFAST
Strawberries, Sugar and Cream
Cereal Omelet
Toasted Muffins
Coffee

LUNCHEON
Spinach on Toast, Steak Gravy
Whole Wheat Bread with Butter
Acidulated Bananas
Tea

DINNER
Roast Leg of Lamb
Mint Sauce Brown Gravy
Franconia Potatoes New Peas
Fresh Pineapple
Coffee

Thursday

BREAKFAST
Baked Rhubarb
Corn Oysters Fried with Bacon
Graham Muffins
Coffee

LUNCHEON
Stuffed Eggplant
Strawberry Short Cake
Iced Tea

DINNER
Cream of Green Pea Soup
Cold Roast Lamb Watercress Garnish
Potatoes Delmonico, Stuffed Tomatoes
Pineapple or Coffee Jelly
Vanilla Wafers

Friday

BREAKFAST
Wheatena with Dates
Sugar and Cream
Buttered Toast Strawberry-Rhubarb
Marmalade
Coffee

LUNCHEON
Cream of Watercress Soup
Baked Macaroni and Cheese
Fresh Raspberries
Wafers

DINNER
Hollenden Halibut, Egg Sauce
Potato Balls Carrots
Lettuce and Cucumber Salad
Toasted Crackers and Cheese
Coffee

Saturday

BREAKFAST
Stewed Cherries
Creamed Potatoes with Curled Bacon
Toast Coffee

LUNCHEON
Fish a la Creme
Tomato Salad
Emergency Biscuit or Raised Rolls
Iced or Russian Tea

DINNER
Lamb en Casserole with Dumplings and
Vegetables
Asparagus on Toast
Lemon Meringue Tartlets
Coffee

SALMON FRITTERS (Original)—1 small can salmon, or equal quantity fresh cooked, 2-3 cup milk, 1 beaten egg, 1 teaspoon salt, 2-3 cup cracker crumbs, ¼ teaspoon pepper. Melt 3 heaping tablespoons Crisco in frying pan, put in salmon mixture in large spoonfuls, shaping into cakes, and fry quickly. Mixture should be as soft as can be handled.

CARROTS, (Probably a common way)—Cook 1½ pints carrots cut in ½ inch cubes in boiling salted water until tender (about 20 minutes); drain, add ¼ teaspoon pepper and 2 tablespoons butter and let it cook through carrots for 3 minutes.

LEFT OVERS.

Asparagus—Creamed in crusts.

Muffins—Hollowed out, fried in deep fat or buttered and browned in hot oven for crusts.

Raspberries—Tapioca pudding.

Mashed Potato—Potato Puff.

Cereal—Cereal Omelet.

Muffins—Split and toasted.

Franconia Potatoes—Potatoes Delmonico.

Halibut—Fish a la Creme.

Lamb—Cold and en casserole; bones in water cress soup.

Chicken—Cold and in soup.

Steak—Rice casserole.

Waste from Potato Balls—Creamed potatoes.

Corn—Corn oysters.

Pea pods and a few green peas—Cream of pea soup.

—Extract, National Food Magazine—Jennie Cunningham.

Economy in Club Entertaining

Luncheon for Sixteen for $3.00

I.

Chicken Broth in Cup, with Whipped Cream
Wafers
Ham Loaf, Mashed Potatoes
Hot Biscuits and Escalloped Corn
Baked Apples
(Pickles, Jelly)
Pumpkin Pie with Whipped Cream
Coffee

COST:

Chicken broth	$ .15
Ham, etc.	.95
One dozen ears corn, at 12c.	.20
One pumpkin, 10c; pies, total	.25
Cream, 1 quart	.28
Potatoes, etc.	.15
Coffee, 1 pound	.35
Biscuit and butter	.30
Apples, etc.	.25
Wafers	.10
	$2.98

II.

Chicken Broth, Whipped Cream
Chicken Croquettes
Potatoes in Cases Lima Beans
Escalloped Tomatoes
Marmalade
Peach Ice Cream Angel Food Cake
Coffee, Demi Tasse

COST:

Chicken	$ .75
Rolls and butter	.35
Potatoes	.10
Beans	.20
Tomatoes	.15
Cake	.25
Ice cream	.80
Cream	.14
Coffee	.25
	$2.99

—*Extract, National Food Magazine.*

Invalid Cookery

The sick room should be screened.

Only persons actually required for the care of the patient should be allowed in the room.

All linen which has been in contact with the patient or soiled by him should be either soaked in carbolic acid, 5 per cent, or boiled.

The eating utensils of the patient should be marked, and used by no one else.

Bath water should be sterilized by the addition of 5 per cent carbolic acid, or by boiling.

Baths are of great importance in keeping the body healthy.

The skin is full of small glands (pores) through which you breathe as much as with your lungs, and when these are clogged you cannot be healthy.

By intelligent bathing the impurities are removed, and the circulation, which is essential to healthy nutrition, is improved.

INVALID COOKERY.

In preparing food for an invalid the following points should be kept in mind:

The food should be served in the most pleasing manner possible.

It should be suited to the digestive powers of the patient, and should be served in small quantities, just enough to satisfy hunger or to furnish needed strength.

In a severe illness the doctor prescribes the kind and amount of food to be given. In long and protracted illness it is necessary to take nourishing food in small quantities at frequent intervals. In short spells of illness it is sometimes best to go without food for a day or more, so as to give the system complete rest.

The following foods are easily digested and are given to invalids: Milk, eggs (raw or slightly cooked), beef tea, gelatinous jellies, gruels, well-cooked cereals, raw oysters, juice of oranges, grapes or other fruit.

SERVING FOOD.

Use the daintiest dishes in the house. Place a clean napkin on the tray, and, if possible, a fresh flower.

Serve everything in small quantities, as it is more tempting to a delicate appetite.

Try to surprise the patients by some unexpected food and in this way induce them to take nourishment.

Serve hot food hot, and cold food cold.

Remove the tray as soon as the food is eaten, as food should never be allowed to stand in a sick room.

BEEF TEA.

Shred ½ lb. lean, juicy beef, and place in a double-boiler, with 1 c. cold water and ½ t. salt. Let it stand 1 hr.; then put over boiling water and heat. Strain and press the meat to obtain all the juices. Serve hot, salt to taste.

EGG NOG.

Beat the yolk of 1 egg, add 1 T sugar and beat until light. Add ½ c. of milk. Beat the white of the egg well and fold it in lightly. Add ½ t. vanilla. Egg nogs are recommended for patients.

EGG NOG WITH FRUIT JUICE.

Make same as egg nog, using 1½ T. lemon juice in place of milk.

FARINA GRUEL.

3 T. farina,	1 c. boiling water,
1 t. salt,	1 c. milk.

Place upper boiler directly over the fire until the water boils. Add farina slowly. Boil up once, then place over boiling water 15 m. Add milk, cook 15 m. longer. Sweeten if desired.

Home Nursing

Sensible Rules for the Nurse.

"Remember to be extremely neat in dress; a few drops of hartshorn in the water used for daily bathing will remove the disagreeable odors of warmth and perspiration.

"Never speak of the symptoms of your patient in his presence, unless questioned by the doctor, whose orders you are always to obey implicitly.

"Remember never to be a gossip or tattler, and always to hold sacred the knowledge which, to a certain extent, you must obtain of the private affairs of your patient and the household in which you nurse.

"Never contradict your patient, nor argue with him, nor let him see you are annoyed about anything.

"Never whisper in the sick room. If your patient be well enough, and wishes you to talk to him, speak in a low, distinct voice, on cheerful subjects. Don't relate painful hospital experiences, nor give details of the maladies of former patients, and remember never to startle him with accounts of dreadful crimes or accidents that you have read in the newspapers.

"Write down the orders that the physician gives you as to time for giving the medicines, food, etc.

"Keep the room bright (unless the doctor orders it darkened).

"Let the air of the room be as pure as possible, and keep everything in order, but without being fussy and bustling.

"The only way to remove dust in a sick room is to wipe everything with a damp cloth.

"Remember to carry out all vessels covered. Empty and wash them immediately, and keep some disinfectant in them.

"Remember that to leave the patient's untasted food by his side, from meal to meal, in hopes that he will eat it in the interval, is simply to prevent him from taking any food at all.

"Medicines, beef tea or stimulants, should never be kept where the patient can see them or smell them.

"Light colored clothing should be worn by those who have the care of the sick, in preference to dark colored apparel; particularly if the disease is of a contagious nature. Experiments have shown that black and other dark colors will absorb more readily the subtle effluvia that emanates from sick persons than white or light colors."

—*Extract, Family Companion.*

What You Should Eat
AND
What You Should Not Eat

DIARRHOEA.

You Should Eat:

Soups—Light broths, rice, gruel, beef tea.
Meats—Scraped fresh beef, beef juice, sweetbreads well boiled.
Eggs—Soft-boiled or poached, on toast.
Farinaceous—Rice, sago, macaroni, tapioca, dry toast with butter.
Desserts—Puddings made of sago, rice, tapioca (no sugar).
Drinks—Tea, toast water, boiled milk. Limewater or Vichy may be added if nausea is present.

You Should Not Eat:

Fresh bread, vegetables, fried food, pork, veal, lamb, oatmeal, pastry, ices, sweets, custards, liquors, raw fruits, nuts, cheese, brown bread.

LIVER TROUBLES.

You Can Eat:

Soups—Light broths or vegetable soups with crackers.
Fish—Boiled fresh cod, bass, perch, trout, pickerel, raw oysters, shrod, halibut, finnan haddie.
Meats—Chicken, veal, chops, game, honeycomb tripe, tender lean mutton, lamb (all sparingly).
Farinaceous—Oatmeal, sago, hominy, arrowroot, crackers, whole wheat bread, dry toast.
Vegetables—Baked, mashed potato with a moderate amount of butter, salads of lettuce, water cress, dandelions.
Almost all fresh vegetables if well cooked can be eaten.
Desserts—Grapefruit, apples (baked or stewed), grapes, berries in season (without sugar), crackers, cheese (camembert or cottage), tapioca, sago or arrowroot puddings.
Drinks—Weak tea or coffee (without cream or sugar), hot or cold water with lemon juice.

Do Not Eat:

Rich soups, hot bread or biscuits, red meats, eggs, sugar, butter, fats, curries, herrings, eels, salmon, mackerel, sweets, creams, nuts, pies, pastry, cakes, dried fruits, liquors and wines.

ECZEMA.

You Can Eat:

Soups—Lamb or oyster broth.
Fish—All kinds except mackerel.
Meats—Beef, mutton, chicken.
Eggs—Cooked in every way, but not every day.
Vegetables—Nearly all, if well cooked.
Farinaceous—Dry toast, toasted crackers with plenty of butter, cereals (well cooked without sugar), except oatmeal.
Desserts—Ripe or stewed fruits.
Drinks—Cream or milk, cocoa made with milk, water.

Do Not Eat:

Fried, greasy foods, rich gravies, pastry, candy, tea, coffee, chocolate, and avoid all liquors.

CONSTIPATION.

You Can Eat:

Soups—Thick soups of meat and vegetables, oyster stew.
Fish—Broiled fresh fish, raw oysters.
Eggs—Soft-boiled.
Meats—Roasts of all kinds and poultry.
Farinaceous—Cream of wheat, oatmeal, bran gems, brown and rye breads at least once a day.
Vegetables—Boiled onions, turnip, baked potatoes (with an extra amount of butter), asparagus, cauliflower, spinach, celery, salads with French dressing containing an excess of oil.
Desserts—Stewed prunes, figs, baked apples (with cream), grapefruit, raisins, nuts, plain puddings, oranges, melons, grapes and pears.
Drinks—Plenty of cold or hot water, black coffee, cocoa, new cider, buttermilk, orange and grape juice.

Do Not Eat:

Salt or smoked fish or meats, liver, pork, beans, new bread, rice or sago puddings, milk, pastry, sweets, tea, cheese, alcohol in any form.

Sip one glass of cold water an hour before breakfast.

Do not drink while eating, and never more than one glass of liquid at one time, and that immediately after the meal.

FEVERS.

You Can Eat:

Foods—Beef tea, chicken or lamb broth, milk, clear soups.
Drinks—Plenty of pure cold water, lemon or orange juice in cold water, lime or toast water, all sipped.

You Should Avoid:

All solid foods or fruits until your physician allows their use.

Give fever patients plenty of good fresh air. They need all the oxygen they can possibly get.

DIABETES.

You Can Eat:

Soups—Mutton, beef, turtle, chicken broth (all with vegetables, but not thickened with any farinaceous substance), oyster stew and beef tea.
Fish—Boiled. Any kind in season, including shellfish (avoiding all dressing with flour).
Eggs—Three times a week, soft-boiled, poached or dropped.
Meats—Chicken, turkey, goose, duck, venison, breakfast bacon, sweetbreads, fat beef, mutton, lamb, ham, tripe, pig's feet, tongue, sausages. (All cooked without flour).
Vegetables—Irish potatoes, lettuce (plain or dressed), celery, cauliflower, spinach, asparagus, cabbage, onions, olives, pickles, tomatoes, dandelions, radishes, string beans.
Desserts—Custards, jellies, creams (without sugar).
Drinks—Water, tea or coffee (without sugar).

Never sweeten your food in the ordinary way, as all the usual sweets are very injurious in this complaint. For sweetening you may use saccharine, to be taken under advice of your physician.

Do Not Eat:

Oatmeal, barley, macaroni, rice, arrowroot, sago, tapioca, rye bread, whole-wheat bread or biscuits, fruit, melons, ices, jams, pastry, honey, candy, sugar or starches of any kind, carrots, parsnips, peas, beets, beans, sweet potatoes, turnips, chestnuts, ciders, liquors or wines.

Diabetes is characterized by an excess of sugar in the blood. This must be disposed of by converting it into fat.

This is the usual diet given in Diabetes, but any change recommended by physicians should be followed.

OBESITY.

You Can Eat:

Soups—Clam bouillon or consomme.
Fish—Haddock, schrod, halibut, finnan haddie, perch, pickerel, smelts.
Meats—Beef, veal, lamb or mutton (boiled), white meat of chicken or turkey, beefsteak, game, meat or fish hash.
Eggs—Soft-boiled or poached, on toast.
Farinaceous—Stale bread, dry toast.
Vegetables—White potatoes, best greens, onions, tomatoes, radishes, olives, squash, lettuce, celery, asparagus, watercress, spinach, dandelions.
Desserts—Berries of all kinds in season, and ripe fruits (omitting all sugar), crackers and cheese.
Drinks—One cup of coffee or tea (without milk, cream or sugar), or a glass of water, sipped.

Do Not Eat:

Salt fish, pork, salmon, sausage, all fat food, macaroni, oatmeal, rice, spices, beets, carrots, turnips, parsnips, puddings, pastry, cakes, sugars, sweets, milk, cream and liquors.

Do not drink while eating.

Take no bread except when eggs are taken for breakfast, then a slice or two of thin toast may be eaten.

Rise at 7 A. M. and take a cold bath.

Sleep only eight hours at night and none during the day.

DYSPEPSIA.

You Can Eat:

Soups—Thin soups of mutton or beef, oyster stew.
Fish—Caviar, raw oysters, cod, haddock and halibut (boiled).
Meats—Lamb, broiled chicken, honeycomb tripe, turkey, mutton, sweetbreads, breakfast bacon.
Farinaceous—Tapioca, sago, rice, whole-wheat, graham, rye, oatmeal bread, dry toast with butter, rice cakes.
Vegetables—Irish or sweet potatoes (baked, boiled or mashed), squash, onions, watercress, celery, asparagus, parsnips, beets, carrots, tomatoes (raw or cooked), spinach, Brussels sprouts, cauliflower, green peas, lettuce.
Desserts—Custards, baked apples, figs, stewed prunes, rice or tapioca pudding, blanc mange with cream, honey, orange marmalade.
Drinks—One cup weak tea, coffee or cocoa, a glass of hot water, sipped after each meal.

Do Not Eat:

Rich soups, hash, pork, veal, stews, gravies, fried foods, liver, corned or cured meats, smoked or salted fish, sausages, duck, goose, crabs, lobster, salmon, pies, cheese, nuts, ice cream, liquors.

DEBILITY.

(Weakness, Lack of Strength.)

You Should Eat:

Soups—Chicken, beef, rich vegetable soups, thick broths, beef tea.
Fish—All fresh fish, boiled or broiled, especially mackerel, salmon, swordfish, also raw oysters and clams.
Meats—Chicken, turkey, duck, game, beef, mutton, lamb chops and cutlets, broiled bacon, broiled honeycomb tripe, calves' liver and bacon, tender juicy steak.
Eggs—Scrambled, poached, soft-boiled, raw with sherry.
Farinaceous—Shredded wheat, rolled oats, rice, hominy, barley, macaroni, sago, tapioca, rolls, biscuits, whole-wheat bread, brown bread.
Vegetables—Nearly all fresh and well-cooked vegetables, and fruit salads.
Desserts—Custard, rice, egg and milk, apple, tapioca, baked Indian, sago puddings, baked apples, honey, marmalade, sweet fruits, nuts, raisins, ice cream, crackers and cheese.
Drinks—Milk, cocoa, chocolate, water.

You Should Not Eat:

Pork, veal, thin soups, hash, stews, cooked oysters, salt meats (except ham and bacon), cabbage, cucumbers, turnips, carrots, spices, pickles, vinegar, pies, pastry, bananas, pineapples.

Do not eat fish at any meal when eggs or meat are taken.

Eat bread and butter with every meal.

Dinner should be eaten in the middle of the day.

—*Extract, Lydia Pinkham's Pamphlet.*

Household Bacteriology

By Martha Van Rensselaer of Cornell University.

In the vegetable kingdom there are micro-organisms that are the smallest and simplest plants known. They live in soil and in water and are found on the surface of foodstuffs. Some varieties prey on man and beast and plant. They number hundreds of species, some of which are of great value in nature's economy and of great benefit to man, while others are sources of danger to the health of man and animal.

Dust is a conveyance of such micro-organisms. In itself dust is practically harmless, although it irritates the mucous membrane, scratches furniture, worries the housekeeper and occupies space needed for something else. We cannot get rid of this old enemy; there will be dust as long as there are people and furnishings. Wind is an agent for distributing it. Housekeepers have probably always asked the question, "Where does all the dust come from?"

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KINDS OF PLANT MICRO-ORGANISMS.

Dust plants are micro-organisms. There are large numbers of minute organisms so small that they cannot be seen by the naked eye but require the aid of a powerful microscope to show their presence; hence their name, "micro-organisms." Various names have been given to these minute living bodies, such as "germs" and "microbes." Literally, germ means the beginning, the first living cell that produces a more complex form.

The plant micro-organisms that we shall consider are bacteria, molds, and yeasts.

Bacteria.

Bacteria are carried on particles of dust, in liquids, and on the surface of fruits and vegetables as well as other articles of food exposed in the market. They may possibly find their way into the house by means of drains, and they are carried by insects. Normally, they are found in the air, in the soil, in water, in food, in the mouth and the digestive tract, on the skin, under the nails, in the hair, in the clothing.

Bacteria are reproduced by a process of division known as "fission." The rapidity of reproduction depends on warmth, moisture, and food supply. Some species produce a new generation every half-hour; thus a single bacterium, if its growth were totally unchecked, might become in twelve hours an ancestor of sixteen million descendants. In two days the descenants would fill a pint

measure. This rapidity of reproduction does not occur, because there are countless checks to the life of every species of bacteria.

We may form some idea of the minuteness of bacteria when we consider that the length of a single bacterium of some species is 1/25,000 of an inch. Many thousands of them may be packed into the space that a grain of sugar would occupy. If one falls into a minute wrinkle of the hand, it is as though it had fallen into a deep ditch.

Molds.

Molds also are micro-organisms. A colony of mold organisms growing on some substance forms a velvety pile having a dark center. We often see long threads budding and branching to form a network over food. Each head produces thousands of dust-like spores. Some molds grow with less moisture than is required for bacteria, and some flourish in the light. They are frequently found in bread, on meat, on leather, and on sugary liquids. They increase very rapidly after rainstorms, and wind affects them less than it does bacteria.

Mildew is a form of mold found on moist clothes that have not been exposed to the fresh air. Mustiness is an indication of mold. Ringworm is due to this species of organism, which gets under the skin and causes inflammation.

Yeasts.

There is a third kind of plant micro-organism which, especially in the country, is often present in house dust. That organism is yeast, which also is a single cell but which is reproduced by little buds that swell out from the parent cell and may or may not break off later. Those that float freely in the air, both inside and outside the house, are called "wild yeasts." So far as shape, size, and method of reproduction are concerned, these are little different from the cultivated yeast plants used to raise bread or to give the "sparkle" to sweet fermented liquors, such as beer.

As the invisible yeast plants can remain alive for a long time without moisture, we may have them furnished to us in dried cakes as well as in the fresh compressed form.

Today, even with the cultivated yeasts, the housewife who mixes her sponge in a dusty room, in dusty utensils, with old yeast —or with everything clean and fresh, if she lets the sponge rise too long or keeps it too hot—is likely to have sour bread. Bacteria can grow well when and where yeast cannot, so that acid will be made from the alcohal that the yeast makes from sugar. The yeast plants grow best at a medium temperature, about 75° to 90° F., which is an average "summer heat." In a temperature above 90° F. yeast cannot grow so well, but bacteria grow better.

The little yeast plant, although so small and simple in structure, is endowed with many of the powers of trees and vegetables and other higher plants. It requires food, has a certain range of temperature in which it grows best, and is injured or killed by too high or too low temperature or by too little moisture. If it be given favorable conditions it will feed, grow rapidly, and reproduce itself by swelling out one part into a bud, which may or may not break away from the mother cell. The most favorable temperature for the rapid growth of the yeast plant, as already stated, is 75° to 90° F. Below that temperature the plant will not grow rapidly and therefore cannot do much work; at a temperature much above 90° it will be killed, and a dead plant cannot work any more than a dead animal can.

The work of the yeast plants is to change the sugar in bread sponge into two substances—alcohol, and a gas called carbon dioxid. The millions of little bubbles in the sponge cannot break through the sticky gluten of the flour, so they raise the whole mass. When the bread is baked the gas is dissipated, the gluten walls of these bubbles are hardened, and little holes remain, filled with air only. The alcohol, too, is driven off by the heat.

It is very difficult to keep weeds out of the vegetable garden because their seeds are carried to the soil in many ways. When the weeds have sprouted or grown a little, they may be pulled up easily. In the bread-garden we want only yeast to grow, but it is very difficult to insure its growth alone since in the bread garden neither the good plants nor the weeds ever become visible. In no other way does household bacteriology interest the housekeeper so much as when connected with the baking of her bread.

Compressed yeast-cakes and dry yeast-cakes consist of a mass of yeast plants mixed with some form of starch and pressed into cakes. One yeast-cake may contain one half-billion yeast plants. It should contain only one species of yeast, but oftentimes other plants gain access to the mixture. If a compressed yeast-cake has been kept over a day or two it begins to turn dark and to soften. That is an indication that the yeast plants are drying and that bacteria have gained access to the cake, thus causing decay. The cake should then be discarded, for it will not make good bread. If dough is left too long or if it is kept too warm, the yeast plants become weakened; then the bacteria that may be present grow and produce an acid, making the bread sour. We scald the milk used in making bread in order to destroy the bacteria present. We bake bread for a full hour, or longer if the loaf is very large, in order to kill bacteria, yeasts, and molds, as all three may be present in a poorly baked loaf of bread and interfere not only with the keeping quality of the bread, but also with the health of the consumer. The careful housekeeper will have clean dishes in which to measure her ingredients and to mix her bread. She will not sweep nor cause a dust to rise in the room where she makes her bread, because

bacteria are in that way raised into the air and may settle on her dough. She will cover the dough in order to keep out dust. With all her care there will always be some bacteria present, but they do not thrive in the sugar solution so well as healthy yeast plants do and at the temperature used for bread-making they do not grow so rapidly as do the yeast plants. They like the alcohol that the yeast makes from the sugar, however, so dough is kept at summer heat only long enough for the yeast to produce sufficient gas to raise the bread but not long enough for bacteria to get a start. It is better not to wrap cloth around hot bread just taken from the oven, because moisture and warmth favor the growth of bacteria and bread that is cooled slowly may not keep so well as if cooled more rapidly.

GERMS THAT ARE NOT HARMFUL.

Some bacteria are of great value in the economy of nature. Man's bacterial friends have been found not less active than, and many times as numerous as, his bacterial foes. To his bacterial friends he owes the fertility of the soil by which plants are nourished. They tear down organic matter and pass it back to its simpler elements through the process of decay, thus ridding the earth of many harmful substances. This is the work of so-called nature's scavengers. There is advantage in what is called incipient decay. When bacteria grow in food the products of decomposition are different from the original nature of the food and produce new odors and tastes. We often need the flavors thus produced to stimulate the flow of the digestive juices. The gamy taste of meat is due to the beginning of decomposition of some of its constituents, and the strong flavor of limburger cheese is owing to the same cause. Gamy food, however, soon becomes objectionable; and cheese is ruined by the development of a too strong flavor of putrefaction.

The most common substances that owe their flavor largely to the presence of bacteria are butter, cheese, and vinegar. Without bacteria, butter, like "apple-pie without the cheese," lacks flavor; while cheese with bacteria would be like "the play 'Hamlet' with Hamlet left out"—an utter impossibility. When you next enjoy the acidity of a pickle, remember to give credit for that pleasant sourness to certain tiny plants, such as those that you have seen massed together in enormous quantities in "mother" of vinegar. Whenever a liquid containing a small amount of alcohol cider, for example, is exposed to the air, bacteria find therein a home and food. A film similar in nature to "mother" spreads over the top of the liquid and before long the alcohol becomes acetic acid, with vinegar as the result.

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PRACTICAL APPLICATION OF PRINCIPLES OF BACTERIOLOGY.

Thoughtfulness, together with a knowledge of the results of bad habits, brings many things to our notice to which we may have previously closed our eyes. We are prone to object to dirt without stopping to consider whether it is harmful dirt. Our housekeeping sensitiveness worries us if a neighbor calls and sees dust on the table. This dust may be less harmful, however, than a spoon dipped into the food that the cook is preparing for a meal, and then placed again in the food without being washed.

Kissing.—Kissing is a custom as old, probably, as the history of human beings, and no doubt to be continued but to be indulged in only when persons are in a healthy condition. Mothers are able to control the custom of kissing babies for a short period; they may lay a ban on the kissing of their infants by the admiring public. They should even control their own desire to kiss their children when affected with tuberculosis or suffering from tonsilitis or other inflammatory condition of the mouth or throat.

Care of finger nails.—We may wash our hands thoroughly, but underneath the nails may be dirt, difficult to reach, which is a retreat for germs. Clean finger nails are always an asset, but in the handling of food they are essential to safety.

Coughing and sneezing.—For coughing and sneezing "in the open" there is no excuse. A handkerchief should be within easy reach to catch the offending spray from the mouth and nostrils. The truth of this statement is an argument for a pocket in a woman's dress, in which to keep the handkerchief.

Handling of toilet articles.—The fingers of the attendant may after such handling unconsciously carry to the mouth infecting organisms.

Care of discharges.—Body discharges contain the seed, or germ, of disease. These should not be left carelessly, as in the case of sputum, to dry and be wafted about by the wind, nor thrown in a loose vault and allowed to reach the well or a body of water from which drinking water is obtained.

Insect pests.—The fly is no longer unpopular merely because of tradition and because of its annoying bites and specks, but also because of the now welll-known fact that it carries disease germs on its feet and in its body. Mosquitoes, too, are in disgrace, for without them malaria would trouble no one.

Other animal disturbers.—Rats harbor the flea that spreads the germ of the bubonic plague. Cats and dogs are the delight of children and of many grown folks, nevertheless they sometimes bring with them germs of diphtheria, scarlet fever, and other diseases.

The common comb and brush.—Common toilet articles, unless thoroughly sterilized, are to be avoided in the barber shop, shampoo parlors, and even in the family, because dandruff and some other skin diseases are infectious.

The common drinking-cup.—Public sentiment has dealt a blow to the common drinking-cup. We never think in our homes of using the same glass at table; yet at school, and in other public places, promiscuous drinking from a cup is still too common, although railroads are fast abolishing the common cup. Laws have been passed in some states forbidding its use in public places.

Food exposed to dust.—It may be difficult to cover all the left-overs and all the food in process of preparation; but the housekeeper is likely to attempt to do this when she realizes that the surfaces of uncovered food catch many flying particles and germs that we would rather not have made a part of our diet. Probably, if the bread had not been left unprotected, the mouse would not have jumped into it. We can see the mouse, however, in time to avoid making him a part of our meal, whereas the obnoxious germ is so small as to escape notice. A table filled with left-overs, waiting to be prepared for the next meal, is a veritable dust-garden, and who knows what additions it may make to our diet? Of course, sufficient heat applied may kill anything dangerous, but we do not want dirt in our food even though the germs have been killed.

Food exposed in the market.—Housekeepers are promoting the interests of health when they buy only those foodstuffs that are protected, on wagons and in the market, from the dust of the street. Handling foods with clean hands necessitates in the grocery a place in which the hands can be washed frequently.

Washing clothes without boiling.—There are pieces in the laundry that should be boiled; handkerchiefs, bed linen, underclothing, and in fact, all clothing are the better for sterilization. The newer methods of cleaning and pressing woolen suits are good from a sanitary standpoint. Cleaning processes involve steam, which is a sterilizer, and often gasoline, which is a partial disinfectant.

Tainted money.—No one refuses even a grimy, dirty bank-bill, but every one feels the need of washing the hands after handling it. Placing coins in the teeth shows decided lack of intelligence or reckless disregard of sanitary principles. The coins that pass through many hands may have become infected with the micro-organisms of diphtheria, tuberculosis, or other specific diseases.

Care of toilets.—Public and private toilets should be disinfected very frequently. The basin, bath, and the seat especially, need careful washing with a disinfecting solution. Cloths and brushes used about the toilet should be scalded and not used for other purposes of cleaning.

Careless dishwashing.—The thorough washing of pans, kettles, and cans makes housework and cooking far from easy, but in the

long run it is easier than caring for sickness or being disabled. It is not so difficult to do the cooking when some one else does the cleaning up. The fewer the creases in a cooking utensil and the more it is scalded, the better. Sun and hot water are most beneficial agents for the safe care of kitchen utensils.

The refrigerator.—The refrigerator might be called on to tell many tales of the life history of germs, for its recesses hide a multitude of secrets. Slime left where the ice has melted shows the need of care in cleaning the refrigerator, for here is food for bacterial life. The spilling of food on the shelves is another source of the same trouble. Ice should be well washed before being placed in the refrigerator. All bits of food should be removed from the shelves and crevices, the refrigerator should be often washed and scalded, and some antiseptic, such as washing-soda, should be used. The chill of the refrigerator retards the growth of micro-organisms, but probably does not destroy them.

BACTERIA AND MILK.

As milk is one of the most important foodstuffs, especially for children, it is very important that every housewife should understand something of the effect of bacteria on it. Every one knows that milk contains a certain number of bacteria. Some of the germs are in the udder itself, but most of them get into milk after it is drawn. Dirty cows, dirty barns and stables, dirty hands and clothes of the milker, and dirty utensils all contribute to increase the number of germs in milk. If the milk is not properly cooled and and kept cold, bacteria multiply and produce many changes in it which often trouble nurse and cook.

The most common of the difficulties encountered in caring for milk is the simple souring, or lactic-acid fermentation. In addition to this well-known process, there are a number of other and more troublesome changes, such as the appearing of bitter milk, slimy milk, and tainted milk.

The lactic fermentation, or common "souring," of milk is brought about by a number of species of bacteria. Formerly it was supposed that a single species produced this change, which consists in the splitting of the milk-sugar molecule into carbon dioxid and lactic acid. It is now known, however, that in the process of splitting up the milk-sugar other by-products are produced. In the simple lactic type of fermentation these secondary products are not very important. It should be noted, however, that in the souring of milk by different species of bacteria, correspondingly different by-products may result. In consequence of this the souring is often accompanied with by-products that are undesirable, if not injurious, to the consumer. In such cases the deleterious substances are often produced before the quantity of acid is sufficient to cause curdling. In fact, the by-products themselves may become harmful while the milk is still considered sweet and wholesome. The most telling

truth that comes to us from all inquiries on the subject is, that different bacteria causing souring in milk produce very different effects on the milk itself, as is shown in the rapidity of the souring and in the types of fermentation accompanying it.

Much has been written concerning disease-producing bacteria in milk. They belong to two distinct classes, namely: (1) The specific bacteria of certain diseases of cattle, which may, if the animal is suffering from disease, gain entrance to the milk. In this class may be mentioned tuberculosis, foot-and-mouth disease, and possibly anthrax. (2) The bacteria of certain human diseases, such as typhoid fever and diphtheria, and the virus of scarlatina and measles. A large number of epidemics of these diseases has been traced to the milk supply; through it the infections occurred. The explanation of this is, that in cases in which the diseases existed among the attendants or in their homes, sufficient care was not taken in handling milk to prevent the entrance of the disease germs. In the case of typhoid fever the water used in rinsing utensils may be contaminated. In cases of diphtheria it often happens that those who have recently apparently recovered from the disease but still have the bacilli in their throats, are engaged in milking or in otherwise handling the milk, when, by sneezing or coughing, the bacilli from the throat may be introduced into the milk. The sad experiences of the past are teaching the importance of taking reasonable precautions against such infection.

When digestive disorders, especially among children, follow the use of milk containing many bacteria, the immediate cause is quite as likely to be the acids and other by-products that have been produced in the milk by various forms of bacteria, as the activities within the digestive tract of any one or more species of the microorganisms consumed. We must look to the effect of bacteria on the milk itself for the cause of many, but not all, of such ailments. It is to prevent those effects that pasteurization is employed.

Milk is sterilized or pasteurized for two purposes: to keep it sweet for a longer time than would otherwise be possible, and to kill all harmful bacteria that it may contain. Sterilizing milk means boiling it for a certain length of time, or heating it nearly to the boiling point, allowing it to stand for some hours and again heating, repeating the operation several times. Boiled milk is very difficult for children to digest. Pasteurization is accomplished by bringing milk to a temperature of 60 to 65° C. (140 to 149° F.) and holding it there for twenty minutes, after which it is cooled quickly. This process does not affect the taste of the milk, and such milk is more readily digested than is boiled milk. We should not need to depend on sterilizing or pasteurizing as a means for providing germ-free milk. The milk should be produced in a clean manner, for clean raw milk is more wholesome for children than cooked milk, no matter what the method of cooking may be. Hot air and steam are valued germicidal agents; hence their wise use in the dairy.

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—*Extract, Series No. 4, New York State College of Agriculture, Cornell University.*

STARVE THE FLY, SWAT.

A Fly Catechism.

Where is the fly born? In manure and other filth.

Where does the fly live? In all kinds of filth. He carries filth on his feet and wings.

Where does the fly go when he leaves the manure piles and the spittoon? He goes into the kitchen, the dining room and the store.

What does the fly do there? He walks on the bread and vegetables bathes in the milk and wipes his feet in the butter.

What diseases does the fly carry? Typhoid fever, diarrheal diseases, diphtheria, scarlet fever and any communicable disease.

How can the fly be prevented? By destroying all the filth about your premises. Screen the privy vault, cover the manure bin, burn all waste matter, destroy your garbage, screen your house.

Either man must kill the fly or the fly will kill man.

Prevent the fly.

Rural or Small School Lunch Room

(By Margaret McClintock, '13, University of Illinois.)

It is only within the last few years that the question of school lunches has received any attention in the United States. People did not seem to realize the connection between food and health, and health and good work in school. If a boy or girl was stupid or misbehaved, it was because of his or her temperament. When it became a law that children should stay in school until fourteen years of age, a knowledge of the effect of education on the future well-being of the boys and girls was shown.

On the other hand, statistics show that a large per cent. of school children are improperly fed or underfed. Investigation shows that this condition is responsible for much of the backwardness and truency of school children, and many aenemic children owe their condition to improper feeding. If parents cannot improve matters, it seems that it is the duty of the school to do so, if possible.

The first step in this line was to serve hot lunches in the poorer schools of large cities, or to give the children crackers and milk in the middle of the morning. The improvement in several directions was marked and seemed to make people feel the necessity of the proper kind and quantity of food for school children.

Since it is the duty of the school to educate children, and improper food makes it impossible for the school to do this; and, since the law requires the children to go to school, it seems entirely within the rights of school authorities to provide proper nourishment. After one or two experiments in school luncheons, which were tried in the face of a great deal of opposition, people began to see there was less tendency to misbehave, the lessons were better, the health was better, and there was a marked improvement from social and cultural standpoints.

At present, nearly all the large cities have their school lunch rooms supervised by the woman's club of the neighborhood, or by a woman provided by the board of education. Their necessity is shown by their rapid growth. Now, granted that warm lunches or warm dishes to supplement lunches brought from home are of so much benefit to children in the city schools, why not have them in the rural schools.

* * * * * * *

There should be a table around which all could sit. It would be used to prepare food and to wash dishes on.

The things most easily served without a kitchen are soup, macaroni, rice, cocoa and things of preparation. If soups were to

be served the vegetables could be fixed the day before and the soup kept in the fireless cooker all night. The children could be divided into groups; one group cooking, one fixing the table and one cleaning up. Each group would do duty for a week, then change. The work should be arranged so that very little, if any, of the school time is used in preparing food. This is essential in the case of those preparing the food, for they need their time, and in case of those studying or reciting, for if all this was done in one room their attention would be distracted from their studies.

The food should be served attractively, using proper silver and paper napkins, to teach the children some of these essentials of table etiquette. The teacher should charge just enough to pay for the food. In many cases it is more than likely that the parents of some of the children would rather send vegetables, milk, eggs, butter and perhaps fruits and meat, instead of paying money. On fair sized farms the small quantities of produce sent to the school would hardly be missed and it would seem that the children were getting their lunch for nothing.

— *Extract, Editorial Clipping.*

Equipment for Domestic Science Teaching

There isn't any good reason why every rural school in the country should not teach cooking or sewing, or both. When it is possible, as it is now, to install a department of cooking in one corner of any schoolhouse for $50.00 or less, then it is high time that every school board in the land, without further deliberation, should make provision for instruction in the justly celebrated art of cookery. A Kansas domestic science teacher, Miss Ida Rigney, of the Kansas Agricultural College, says that $50 will buy all the equipment needed to teach young girls in a country school the elementary lessons in cookery. Miss Rigney has taught domestic science in the public schools for several years. A list of the equipment needed and the itemized cost is given on this page.

This equipment is complete. It might be possible to select a list of equipment that would be cheaper than this one; in fact Miss Rigney says a school could be fitted out scantily for $10 or $15. But then $50 is cheap enough to be within the reach of any school. Between 500 and 600 rural schools in Kansas, in the last two or three years, have added courses in domestic science.

EQUIPMENT FOR DISTRICT SCHOOL.

Suggested by Miss Ida Rigney, Kansas State Agricultural College, Manhattan, Kansas.

List	Cost
1 Table	$20.00
1 Stove (2 burner coal oil)	10.00
1 Oven	2.00
1 Oil Can (5 gallons)	.60
4 Dish Pans	4.00
4 Kettles (Gray granite, 5½ inches)	.60
4 Sauce Pans (Gray granite, 4½ inches)	.40
2 Omelet Pans	.40
4 Small China Bowls	.40
4 Teaspoons (Plated)	.28
Tablespoons (Plated)	.30
4 Paring Knives	.20
4 Kitchen Knives	.36
4 Measuring Cups	.40
4 Cake Tins (4½x4½x4½)	.60
4 Pie Tins (5 inch)	.32
2 Biscuit Cutters	.10
1 Grater	.15
2 Egg Beaters	.12
2 Egg Whips	.10
2 Rolling Pins	.20
4 Bread Pans (9½x4½x3½)	.80
4 Molds (Tin)	.20
2 Soap Dishes	.30
4 Scrub Brushes	.20
2 Towel Racks	.20
1 Can Opener	.05

List	Cost
1 Teakettle	$ 1.00
*1 Meat Grinder	.85
1 Lemon Reamer	.10
2 Strainers	.10
*2 Toasters	.25
1 Small Garbage Can	.50
*1 Broom	.50
1 Dust Pan	.20
1 Muffin Tin	.40
1 Butcher Knife	.95
*1 Frying Basket	.15
*2 Potato Mashers	.10
1 Flour Can (5 lbs.)	.10
1 Sugar Can (5 lbs.)	.10
1 pt. Mason Jar for salt	.05
1 pt. Mason Jar for pepper	.05
*China for Serving.	
1 Cup	.15
1 Saucer	.15
1 Small Plate	.15
1 Sauce Dish	.10
1 Sherbet (stemmed)	.10
1 Water Glass	.10
1 Bouillon Cup and Saucer	.15
1 Knife	.50
1 Fork	.50
1 Bouillon Spoon	.30
1 Salad Fork	.35

*Where funds are low, these may be omitted from the equipment. The cost may also be lessened by reducing the number of several items.

Cost to Students.

1 Apron	$ .50
1 Dish Towel and Cloth	.05
1 Hand Towel	.05
1 Holder	.05
1 Notebook	.05

Total Cost of Equipment	$49.23
Total Cost to Student	.70

A table four feet square with drawers and a cupboard on each side in which to keep the utensils can be built for about $20. This is large enough to satisfy four girls at a time easily, and even eight, if necessary. If more girls wish to take the work different hours may be arranged and the girls divided into shifts.

Once the school is furnished with the necessary equipment the cost of maintenance, or the cost of teaching, is trivial. Two and one-half cents a lesson for each student is the approximate cost. A lesson usually consists of one recipe. The lessons, Miss Rigney suggests might be even given once or twice a week. Many Kansas schools find it convenient to devote Friday afternoon, after recess, to teaching cooking, agriculture, or manual training—one lesson a week. Many times the girls are glad to meet Saturdays to receive instruction in this work, which never fails to interest them.

A lesson now and then at the noon hour on cold days, when hot drinks or soups may be made and served with the children's lunches, have been found to increase interest among the pupils. Even a lesson after school hours may be made so attractive that girls are eager to remain and learn to prepare some dish which, later, they may make for the family at home. Should the equipment include a stove of only one burner the girls should take turns in doing the various parts of the lessons. Under such conditions it is well, says Miss Rigney, to divide the class into divisions. The first division should do the "mixing," the second division the baking, and the third the washing of the utensils. At the next meeting of the class the divisions should exchange their work, thus enabling every girl to have a turn at each part of the work.

The expense of teaching sewing in a rural school is even less than that of cooking, Miss Lewis says. The girls can very easily bring scraps of material from home upon which to try the various stitches, seams, patching and darning. The desire to learn to sew manifests itself very early in girls, and there is practically no age too young to introduce the study of this art in the school. To the youngest girls in the school sewing may be made interesting by letting them think of it as play at first. Making doll colthes and other things will be fascinating work for them, and at the same time they will be learning something that is valuable to them.

—*Extract, Threshermen's Review.*

Domestic Science Club

The Clubs of Domestic Science is carrying the teachings of "Right Living" to those who have no other means of learning; teaching food values, how to make the cheaper foods palatable, economy in purchasing, home management, how to get the most from the means obtainable and how to live under hygienic conditions to the end that home life may be more attractive.

CONSTITUTION OF THE CLUBS OF DOMESTIC SCIENCE.

ARTICLE I.

The club shall be known as the Club of Domestic Science.

ARTICLE II.

The object of the club is to study scientific ways of conducting home work in order to preserve the best interests of the family; to discuss the best expenditure of time, strength, and money to secure the highest efficiency; to broaden the outlook of the family through the culture of the mother of the household; to encourage a social spirit in the community while working together for the good of the family; to consider the home as a part of the community and therefore having relations with church, school and social well-being; to elevate the character of ordinary life to the end that the homes shall be the best in America and most attractive to the rising generation.

Any person interested in the foregoing objects for study is eligible for membership.

ARTICLE III.

The officers shall be a President, a Vice-President, a Secretary, a Treasurer, Corresponding Secretary, and Teacher.

The duty of the President shall be to preside at all meetings and to call extra sessions whenever practicable.

The duty of the Vice-President is to act for the President in the absence of the latter or whenever she is unable to attend to her duties.

The duties of the Secretary and the Treasurer shall be, respectively, to keep minutes of the meetings, and to care for the finances of the club if there be any.

The Corresponding Secretary shall give notice of meetings, conduct correspondence of the club, and write for state and government bulletins that shall aid in the study of the club.

ARTICLE IV.

The majority of the members present at a meeting shall constitute a quorum.

ARTICLE V.

The officers of the club shall constitute an executive council, which shall determine the place of meeting and the time and number of meetings, and arrange for the year's program.

ARTICLE VI.—ANNUAL MEETING.

Section 1.—The annual meeting for the election of officers and the receiving of annual reports, and for any other business that may come regularly before the club, shall be held at.....
The term of officers shall be for one year, or until their successors are elected and qualified.

Section 2.—Nominations shall be.....

ARTICLE VII.—AMENDMENTS.

This Constitution may be amended at any regular meeting of the club by a two-thirds vote of the members present and voting, provided the amendment has been submitted in writing at a previous regular meeting.

BY-LAWS.

ARTICLE I.—DUTIES OF OFFICERS.

Section 1.—It shall be the duty of the President to preside at all meetings, and to perform all other duties appertaining to the office of president.

Section 2.—In the absence of the President, the Vice-President shall perform all the duties appertaining to the president's office. In case of a vacancy, the Vice-President shall succeed to the office of the President until the next regular election.

Section 3.—The Secretary shall keep a correct record of all transactions of the club.

Section 4.—The Treasurer shall receive all moneys of the club, collect all dues, and keep an accurate account of all receipts and disbursements. She shall pay no bills, except on orders of the Executive Council.

Section 5.—The Corresponding Secretary shall give notice of meetings, conduct the correspondence of the club, and write for state and government bulletins that shall aid in the study undertaken by the club.

ARTICLE II.—QUORUM.

The majority of the members present at a meeting shall constitute a quorum.

ARTICLE III.—DUES.

The dues of this club shall be $1.00 per annum, payable two weeks before the annual meeting.

Farmers' Bulletins

The United States Department of Agriculture, Washington, D. C., has issued the following free farmers' bulletins (by Congressional distribution) dealing with the subjects as follows:

Farmers' Bulletin No. 375—Care of Food in the Home.
Farmers' Bulletin No. 248—The Lawn.
Farmers' Bulletin No. 34—Meat as Food.
Farmers' Bulletin No. 127—Important Isecticides.
Farmers' Bulletin No. 131—Household Tests.
Farmers' Bulletin No. 459—House flies.
Farmers' Bulletin No. 487—Cheese and Its Uses.
Farmers' Bulletin No. 332—Nuts as a Food.
Farmers' Bulletin No. 363—Milk as a Food.
Farmers' Bulletin No. 182—Poultry as a Food.
Farmers' Bulletin No. 389—Bread and Bread-making.
Farmers' Bulletin No. 85—Fish as Food.
Farmers' Bulletin No. 93—Sugar as Food.
Farmers' Bulletin No. 345—Disinfectants.
Farmers' Bulletin No. 413—Milk and Its Use.
Farmers' Bulletin No. 293—Fruit as a Food.
Farmers' Bulletin No. 128—Eggs as a Food.
Farmers' Bulletin No. 84—Experiment Station Work.
Farmers' Bulletin No. 295—Potatoes as a Food.
Farmers' Bulletin No. 298—Corn as a Food.
Farmers' Bulletin No. 203—Canned Fruits, Preserves.
Farmers' Bulletin No. 256—Preparation of Vegetables for the Table.
Farmers' Bulletin No. 121—Beans, Peas, Legumes as a Food.
Farmers' Bulletin No. 249—Cereals as a Food.
Farmers' Bulletin No. 490—Bacteria in Milk.

Boston Cook Book, by Mrs. Lincoln, published by Wilson & Son, Cambridge, Mass.
Illinois University (Urbana-Champaign) Bulletin, Vol. X, No. 13—Choosing Textiles.
Illinois University Bulletin, Vol. IX, No. 32—Rational Diet.
Illinois University Bulletin, Vol. IX, No. 36—Principles of Jelly Making.
National Food Magazine—Pierce Publishing Co., 45 West 34th Street, New York City, N. Y.

Bulletins and books above referred to are excellent for Club under study.

"As a rule the department of agriculture will not send more than a few of these bulletins at one time, and sometimes the department's supply is exhausted, so I would suggest that you select those subjects in which you are most interested. If you are acquainted with the congressman of your district it might be possible to secure them through him, as each congressman is allowed a liberal supply of such bulletins for distribution. These bulletins are almost invaluable, being written by experts on the various subjects after careful and elaborate investigations."—Extract, Chicago Tribune.

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