

A PRACTICAL APPLICATION OF DOMESTIC SCIENCE.

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- HOW TO MEASURE. -



The best results can not be obtained without correct measurements. The above is an illustration of level measurements used in the experiments recorded. Cups one-half pint, with teaspoon and tablespoon of regulation size.

To measure level dip cup or spoon into dry ingredients and level with a kinife. One half spoonful is one spoonful divided lengthwise. One fourth is one half divided cross-wise.

A PRACTICAL APPLICATION OF DOMESTIC SCIENCE.

We read in Holy Writ of the busy woman, and to judge from Solomon's description not even the most up-to-date club woman of today has more to do than that "virtuous woman" whom he describes. One who worked willingly with her hands; who arose while it was yet night to give meat to her household; who bought a field and planted it with her hands; who clothed her household with scarlet; and herself with purple and silk; and who made fine linen to sell.

The husband of this remarkable woman "sat among the elders of the land", which is not surprising since we think he had nothing else to do. He praised his wife, and her children arose and called her blessed. Probably this was a sufficient reward for all the labor she performed, but we seem to have drifted away from that pleasant arrangement, regardless of the fact that the wants of the human family are the same today that they were four thousand years ago. The family must be fed and clothed; guarded against the snow and the heat; the husbands sit among the elders and are known in the gates, and the problems of living must be solved by women.

In the light of modern learning we have placed this problem in the category of Domestic Science, and when its principles are rightly understood, its devotees expect the millennium dawn.

To those who are outside the pale, Domestic Science means a collection of theories that are beautiful to talk of and write about, but are not suited to real practical living. What a mistaken idea! The carpenter whose knowledge of his trade is masterly is better fitted to build a house, than the one who knows only how to drive a nail or

plane a board. The farmer who understands rotation of crops, subsoiling and mulching knows how to care more intelligently for his land, ^{than} if he knows only how to plow the ground and cultivate the corn. Then carry the application to cooking, and admit that the woman who studies food compositions, food combinations, and principles of cookery; who understands the needs of the body, and what food is best suited to supply its needs, better suited to prepare nutritious dinners than if she knows only that certain foods are cooked a certain way for breakfast, certain others for dinner, and the left overs for supper. It is not theoretical but practical to bring a knowledge of chemistry, physics and botany into use in making a loaf of bread. It is eminently practical to know the cause if that loaf of bread fails to come from the oven, light, sweet and nutritious.

In making bread it is not a question of having "good luck", certain temperatures are necessary for the sponge, the dough, and the oven.

Qualities of good bread.

1. Lightness.
2. Firm texture.
3. Creamy color.
4. Fine grain.
5. Sweet.
6. Brown crust nutty in flavor.
7. Moisture.

For general purposes compressed yeast is most satisfactory six hours being sufficient time from making the sponge until the bread comes from the oven, providing the temperature for the sponge and the dough be kept at 90°Fr to 100°Fr.

Lightness depends on the quantity and quality of the yeast, and

the proper time being given for growth of the yeast plant. The following recipe is satisfactory.

2 c milk or water, scalded and cooled:

1 tbsp shortening - butter or lard:

1 tsp sugar:

1-1/2 tsp salt:

1/2 cake of yeast foam - or 3/8 cake compressed:

6 to 7-1/2 c flour.

Dissolve the yeast thoroughly in 1/2 C warm water, to which the sugar is added. Then make a stiff drop batter of the milk and part of the flour, add the salt, shortening and yeast; let it rise to double the bulk, knead in the rest of the flour making a smooth velvety dough.

Let the dough rise to double the bulk. Mould into the baking pans.

Let rise again and bake from three fourths of an hour to one hour.

The above recipe makes two medium sized loaves, that require about fifty minutes for baking. A firm fine grain is secured by mixing the sponge so that the yeast is evenly distributed, and by not allowing it to rise too much. In the latter case the bread will be coarse grained and have large holes distributed through it.

Creamy color is given by the use of milk and of butter and by kneading it but once, - that when the dough is made. Butter helps give the nutty flavor; but this depends most on the baking. If this size loaf bakes one hour, there is a noticeable difference in taste from that of fifty minutes

Sweetness comes from the sugar in the recipe and from the turning of starch of the flour into dextrine in the process of baking combined with action of the yeast. That in the crust is caramelized, When the bread is put to bake the oven must have a temperature of 400° to 425°F.

else the crust will form over the top, and as the bread rises break from the side crust. The oven test is to brown a teaspoon of flour in four minutes to a deep golden brown color. Keep the flour to use in gravies and soups, since it improves their flavor. But if using for thickening use nearly double the amount called for in unbrowned flour.

The crust will be crisp and brittle if the bread is allowed to cool in the air. If the crust be oiled with butter it is made soft.

Under no circumstances put away bread before it is perfectly cool. Keep in a tin box or a stone jar. The receptacles for keeping bread must be frequently scalded, three times a week in summer and sunned each time for an hour, to keep the bread from moulding.

MEAT and EGGS.

These are much used and much abused foods. Meat is usually taken as the type of nitrogenous foods, but probably 75% of the meat is made indigestible in the cooking. To the average cook a piece of meat, regardless of quality or quantity, must be "boiled". The tougher the piece the harder the boiling. No doubt you have heard this complaint "I have boiled that meat hard for three hours, and it is tough yet". Like the Irishman who complained that he had cut his coat off three times and it was too short yet.

The following experiment with meat speaks for itself. A very tough piece from the neck, three and one half pounds, was put to cook in a kettle of boiling water. Boiling temperature was kept for fifteen minutes. The kettle was then covered tightly and placed at the back of the stove where the temperature of the water would be between 170° and 180°Fr. In two and one half hours the meat was perfectly tender and well done. The center a beautiful pinkish color

with no sign of the red juices. The flavor particularly pleasant. This is the six cent boiling meat, which according to the United States bulletins on the subject is far more nutritious than the more expensive cuts, and yet is most frequently passed by for porter house and tender loin steak. When properly cooked its flavor is ~~far~~ better than either of the latter. When meat is cooked until it falls apart, it is not made tender; the connective tissue has been dissolved, but the fibers have been toughened. They are similar in composition to the white of egg and are hardened by high temperature in the same way as the white of egg.

There is hardly space in this paper to go into the details of the various ways of cooking meat, but it must be borne in mind that a low temperature is most desirable.

In roasting and broiling, meat is first subjected to the high temperature, even greater than the boiling water. In both cases of the water and the dry heat the object is two fold. 1. The outside tissues are seared and form a crust which will prevent the escape of the juices. 2nd There is a possible danger from parasites, which is averted by the high temperature.

Eggs are frequently cooked in combination with other foods, such as eggs and starch. In such cases the starch must first be cooked ten to twenty minutes with the milk, and at boiling temperature before the eggs are added. Eggs cook at 170° to 180° Fr. The white shows a milky color at 140°, and coagulates at 180°. An interesting fact found by cooking eggs in the shell, in water at 180° Fr, is that the yolk will harden, while the white remains perfectly jelly-like and tender. Usually this is reversed. The eggs are put to cook in very hot water, which is then brot to boiling point, usually for three min-

utes. Result,- a hard thickened covering is formed by the white which prevents the heat penetrating to the yolk. The yolk will be soft and partially cooked while the white is over done. The fact ^{that} the yolk will harden at ~~at~~ a moderate temperature shows that it cooks at a lower temperature than the white.

Meat, eggs, fresh green vegetables, leguminous plants, milk and milk products are nitrogenous foods. Generally speaking all nitrogenous foods cook at low temperature. With vegetables, an exception is necessary because of the cellulose contained in the plants, which is softened by the high temperature.

The cereals are the starchy foods which require high temperature. Starch must cook at 212° Fr. or even a greater temperature such as acquired in baking. The rule for fresh vegetables is, cook in boiling salted water, one teaspoon salt to 1 quart of water, from twenty minutes to one hour and a half. The water should cover the vegetables. This keeps the color of the vegetable. Those of high odor, such as onions will not be so unpleasant, if the vessel is not covered while they cook.

Potatoes, cabbage, onions, peas, cauliflower, asparagus, new turnips, green corn, celery, cook in twenty to twenty-five minutes. Beets, old turnips and green beans require a longer time, from one to one and a half hours.

The stock from cabbage, peas, cauliflower, asparagus, new turnips and celery should be kept for soup and for white sauce. The last mentioned vegetables are most satisfactory served with white sauce. When the stock is used it may be mixed with milk half and half.

White Sauce

- 1 c milk or stock, 1/2 tsp salt:
- 1 tbsp flour, 1 tbsp butter:

Melt the butter. Blend in the flour and salt. Add the milk very slowly, stirring constantly to keep the flour from forming lumps. Cook at boiling temperature from twelve to fifteen minutes. Drain the vegetable, and pour over it the white sauce. Serve at once. The secret of making white sauce is to have the flour and butter thoroly blended, and to cook until there is no suggestion of a pasty taste.

Potatoes must be drained as soon as tender and stand uncovered, or with a cover of coarse meshed cloth spread over, in a warm place. When potatoes are cooked too long, or allowed to stand in the water, they become heavy, sweet and "gummy". This gummy sweetness is caused by the starch being changed to dextrin.

In the summer, most fresh vegetables are found very palatable if served as salads. (This gives the added nutrition of the salad dressing.) A few appetising combinations are found in the following:-

1. Variety Salad:

- Lettuce - shredded - one head;
- Raw tomatoes - sliced - 1 cup;
- Raw onions - sliced - 1 cup;
- Raw cucumbers - sliced - 1/2 cup;
- Serve with oil and vinegar.

2. Cooked beans 1 cup;

- Cooked beets 1 cup;

3. Potatoes - 1 cup;

- Onions - 1/3 cup. radish garnish.

4. Peas - 2 cups;

- Shredded lettuce leave 1 head;

5. Celery 2 cups;

- Apples - diced - 2 cups. If new ripe apples are used, wash and rub dry, but do not peel.

Serve the last four with boiled dressing or Mayonnaise.

Boiled Dressing.

Yolks - 4 eggs;
 Vinegar - 4 tbsp;
 Salt - 1/2 tsp;
 Sugar - 1 tsp;
 Mustard - 1 tsp - prepared;
 Butter - 1 tsp.

Beat yolks to cream, heat vinegar, add dry ingredients. Stir into the yolks and return to the fire, cooking over a pan of hot water until the mixture thickens. Beat the butter in, and place in a cool place. Thin with cream for use. For 1 quart of salad, 1/2 c dressing is sufficient.

SOUPS.

Soups are the acme of economy and made of what many housewives throw away. Meat and vegetable stocks are the foundation. Clear soups are used as a first course in heavy dinners. These are found especially appetizing if flavored with vegetables, just enough to give a suggestion of the flavor. For example:

Tomato Clear Soup.

The juice from one quart can of tomatoes and enough water to make one quart;

1 tablespoon diced celery;

1 tablespoon diced onions;

1 tablespoon browned flour;

2 tbsp butter;

1 level teaspoon salt;

1 level teaspoon sugar;

Allow vegetables to cook five minutes. Blend flour, butter, sugar

and salt, stir into liquor, boil five minutes, strain thro a cloth and serve with crisp crackers or croutons. Croutons are little half inch cubes of bread toasted to a light brown. The thickened soups are served with light dinner or luncheon. The foundation being a vegetable or meat stock to which is added a white sauce, proportions governed by the thickness desired. In making soups, the principal care to be observed is not to have strong flavors, only a suggestion, and a blending of good combinations. When flour is used, unless for a white soup, the flavor is greatly improved by browning the flour in the oven.

PASTRIES. Pastries did not hold a very important place in this "practical application" but the following points were noted in the making of pies. The dough must not be kneaded at all. Shape into round cakes and roll to the desired thickness. When fruit is used, put flour and sugar in the bottom of the crust before putting in the fruit. Mix the spices with the sugar. Water is any, must be cold. This use of the flour and sugar applies especially to very juicy fruits such as cherries and berries. The object is to prevent the crust being soaked. In pies with a top crust the juice will not come out between the edges if an extra piece of crust half an inch wide be placed around the edge between crusts, wet the edge of under crust very slightly, with cold water, before placing the little strip, press down lightly, wet this piece and put on top crust, pressing the edges together firmly. For custard and cream pies glaze the bottom of crust with the white of egg to prevent soaking.

In mixing pastry do not put the hands into the mixture. Cut the shortening into the flour, and mix with a spoon.

DESSERTS. Cream desserts usually mean a combination of milk,

sugar, eggs and a starch, either rice or corn starch. Such a combination gives all the nutrients: but requires careful cooking. The starch must cook twenty to thirty minutes at boiling temperature. Eggs and milk at 180° Fr. The milk has to be sacrificed for the starch but the eggs must be added after the starch is cooked, this preserving their food value.

An interesting fact was found in testing milk at different temperatures. At 140° a scum appears on the top which can be beaten back into the milk. After raising the temperature to 160° the scum can no longer be beaten back.

Creams in which fruit juices are used instead of milk must not have a strongly acid juice with starch: lemon juice must never be boiled. If a recipe calls for lemon juice add it after the entire mixture is cooked. Custards must not boil else they curdle. The test when done is coating of the spoon. Custards and creams used for frozen desserts are finer grain, and smoother if the sugar is made into syrup for sweetening. When sweetening lemonade or sorbet, a milder taste is obtained if the sugar be boiled and clarified. To clarify stir into the hot syrup the beaten white of egg, and skim.

FRUITS. Fresh fruits are usually so welcome they are used raw as much as is practicable: but one exception is the apple. Apples cut in eighths and cooked in water to cover to which is added 2 table-spoons sugar to 1 cup water, will retain their shape and be translucent. The tendency to flatness in taste is overcome by adding 1/2 tsp grated lemon peel to 2 cups apples, while the fruit is cooking.

Dried fruits requires careful washing and cooking. It should be soaked from four to ten hours and put to cook in the same water in which it soaks. If the fruit is to cook for several hours do not add

the sugar until it is about ready to remove from the fire, else a strong taste is given. Here, as in beverages, the strong taste is lessened if the syrup is used.

CANNING. Fruit canned without sugar is found to retain the fruit flavor more distinctly than that which is sweetened. Jellies cooked the regulation time of twenty minutes, sugar and juice equal parts, give better results than if less sugar is used, and longer cooking given. Jellies will gelatinize if the cup into which they are poured be left uncovered except with a thin cloth as a protection from the dust. Let the glasses stand in the sunlight.

These experiments noted from one summer's work have not been tested by the writer, from the standpoint of analysis. But the experiments were made, the results noted, and the explanations sought in various text books. Matthieu Williams "Chemistry of Cookery" and Willard's Organic Chemistry being used for references.

To sum up the summer's work, it was pleasant and profitable: and the work being done from the standpoint of experimenting in a "kitchen laboratory" was lifted above the level of drudgery, and assumed the dignity of scientific investigation.