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# Food, and Its Relation to Domestic Science

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Domestic Science is the study of the sciences which would be employed in the explanation of all phenomena exhibited in the practice of household affairs. Special importance is given to the chemistry of food, not only the changes which the food undergoes by cooking or other preliminary treatment, but also to those which take place in the storing of food and in the processes of digestion, absorption, and assimilation. The chemistry of other household activities like cleaning or the effect of adulteration is also included. Physics as applied to heating, ventilation, and plumbing is equally important in its relations to domestic science. Physiology, which is chemistry and physics as related to the animal body, is used to explain the effect of food as well as of their adulteration.

Domestic Science and household economy are subjects which can no longer be regarded as fads, they deserve rather the thoughtful attention of everyone who works to benefit humanity. It is a truth which has long been accepted 'that the health and morals of a people depend largely upon the food they eat and the homes they live in.'

Although the preparation of food is one of the oldest arts, cookery as applied to science is still in its infancy: and even now we do not recognise the value of this subject. Only within a few years has it received any recognition whatever in the United States. In this respect we are far behind European countries: notably France and Germany. Abroad a beginning was made about 1790 in an attempt to improve the food of the poor, and it was then that Count Rumford introduced into the soup kitchens of Munich, the soup which has been named for him. From this time on interest in the subject of foods, both of men and domestic animals steadily increased until now, the question of food, a study of food and food materials, the cost, preparation, digestibility, and hygiene of food are being carefully investigated. In this progressive movement the Boston School of Technology, where Mrs. Richards has taught a high grade of science for years, and the University of Chicago are entitled to take the lead. There are excellent courses in domestic science at Drexel and Pratt Institutes, and of late the Grammar Schools in nearly every city where modern methods of education are employed have given much valuable

instruction at their cooking schools in the preparation of foods, and the care of the household.

Recently domestic science has been introduced into the agricultural departments of a number of colleges; and this is as it should be; for is it not quite as essential to give the young women of to-day an opportunity to learn the proper way of organizing and managing a household, as to teach young men scientific farming? Certainly, it would seem that skill in the care of milk, fruits, and other products and in the preparation of wholesome, nutritious food, should contribute to health, comfort, and happiness, quite as much as an expert knowledge of drainage, rotation of crops and other agricultural accomplishments.

The formation of a scientific dietary depends upon a knowledge of foods as to their richness in proteids, carbohydrates, and fats. First, let us consider what is meant by the term, food. A food is a substance, which, when digested and assimilated, furnishes material to build up the body, and to replace matter removed by wasting, and which by oxidizing, or burning, in the blood evolves heat.

Foods are divided into three classes: nitrogenous, non-nitrogenous, and mineral. These classes are again divided into five proximate elements, two of which will be found in the meats, the fats and proteids; a third, that division which does not occur to any considerable extent in meat, designated by carbohydrates, which comprise the sugars, starches and other non-nitrogenous bodies; fourth, the salts and mineral constituents, illustrated by the common salt with which we flavor our foods; and the fifth class, water, which nature furnishes us directly.

Of the two great classes, animal and vegetable, the fats and proteids predominate in the animal kingdom, and the carbohydrates in the vegetable. Still there are two well known vegetable proteids which occur in foods. The first of these is the gluten of wheat, oats and other cereals which on account of its sticky nature enables the to manufacture his own "chewing-gum." This proteid is very important as it represents almost the sole nitrogenous element in these grains. The second of these vegetable proteids is the legumin, which is found in such plants as peas, beans and lentils. It might be briefly stated that

the proteids are "flesh foods," as nearly one half of our body is made up of muscle which is one fifth proteid. Experimenters have found that under certain conditions proteids furnish heat and muscular energy: still the fats which are obtained from both the animal and vegetable kingdom may be called the heat foods. Those used in cookery are known as butter, lard, suet, olive and other vegetable oils. Vegetables as a rule are poor in fats, however some of the cereals like corn and oats contain from four to seven per cent fats.

The carbohydrates, especially the starches, are the cheapest of food constituents and therefore are liable to be in excess, especially in the food of the poor. In some of the eastern and southern countries rice and corn constitute the larger part of the food of the poor: and the Indians live mostly upon the seeds of grasses and wild plants. The potato for the most part is composed of cells containing starch grains, and a similar structure characterizes the wheat, oats, rice and all farinaceous foods. Great care should be taken that all food containing starch should be well cooked, as raw starch is difficult to digest. In cooking the potato it must be treated with care.

First put it into boiling water and keep it boiling rapidly until tender. When put into the boiling water, the starch grains swell, and burst the cellulose walls containing them. When the potato is done, it is oftentimes spoiled by being allowed to absorb steam and so becomes soggy. As soon as boiled potatoes are tender, they should be drained, allowed to dry for a few moments, seasoned and served as soon as possible. The quality of the potato is of great importance: it should be of a mealy variety and perfectly ripe.

The food value of water is especially important, as it is the medium for the conveyance of food materials to the growing cells of our bodies and by evaporation makes it possible to keep the temperature of the body constant. From a sanitary point of view the quality of the water is of the utmost importance. A hard water, that is, one which contains compounds of lime and magnesia in solution, has been found by scientists to be injurious to most persons. Surface water is especially undesirable, as water is subject to pollution and is one of the most active disease carriers known.

Some of the diseases ascribed to impure drinking are malaria, typhoid and yellow fever, cholera and diptheria. There are many instances where people have assembled on account of some celebration and sickness has followed in the case of a large proportion of those who have used a certain water, while the others have not been affected. Undoubtedly the best for drinking is a moderately soft spring water, in which all possibility of contamination is out of the question.

Nature has provided us with two perfect foods, food which contains all the elements in the right proportions necessary to support the body, and to the activity of its functions. These foods are eggs and milk, both of which the farmer usually has in abundance. It should be added that milk is not only a perfect food for infants, but for the growth of all injurious germs and bacteria.

It is extremely important that milk should be pure, as is more liable to contamination if exposed to impure atmospheric conditions than any other article of food. Frequently a small quantity of water is added to cheapen it; and it is this contact with water which renders the milk trade a ready agency for the spread of disease. As soon

as milk is brought into the house it should be boiled and then there is no danger of those minute organisms called bacteria.

To keep milk sweet in warm weather is a serious question. A good method is to can it as one would fruit. Fill the glass jars and put on the lids, but not tightly, then place them in a steamer over cold water; heat the milk gradually, and steam the jars for an hour, then tighten the tops. Milk treated in this way will keep for several weeks.

Within the last fifty years Chemists have detected that manufacturers and dealers were adulterating common articles of food; such as, tea, baking powder, cream of tartat, all of the spices and honey. It has been discovered that the leaves of thirty two different plants have been used as a substitute for tea. Oftentimes iron filings are added to increase the weight. The addition of mineral matter may be detected by burning a known quantity in a platinum dish, and weighing the ash, good tea containing from five to seven per cent. Ground gypsum, which is worth one cent per pound, is sold for cream of tartar at ten cents per quarter of a pound. This fraud can be detected by anyone who knows that cream of tartar is soluble in water

and gypsum is not.

It is said that much of the American honey is entirely artificial, the comb being made of paraffin and filled with glucose syrup. Two simple tests will prove this. Since normal honey is collected by the bees from the flowers, it will contain pollen grains: and genuine beeswax is blackened by warm sulphuric acid and paraffin is not. Now, the remedy for this sort of fraud , is the education of the general public to such an extent, that they can with a certain degree of accuracy detect cases of adulteration or substitution.

The housewife should consider the treatment of food supplies from a sanitary standpoint, usually however, she contents herself with looking after the cook in the choosing and preparing of the meals, sees that the housemaid keeps the living room in order, and then wonders why her family contracts disease. Death lurks in the sinks and dish towels of many kitchens as it does in rubbish piles or stagnant water.

Oftentimes there is contagion from fruit. I have seen apple men polishing apples on their soiled clothes; and the fruits which are displayed before stores are completely

covered with dust from the pavements where there is scarcely any unwholesomeness or decay, disease germs or filthiness which does not find lodgement.

The average of thirteen analyses, made in March and April, 1890 of the air from streets of various parts of New York showed the average number of bacteria in ten L. or ten quarts to be 376. This will prove how important it is that apples or any fruit bought in markets or gathered from the ground should be thoroughly washed before it passes our lips.

The importance of domestic science as a part of every girl's education is great. Her whole life is to be influenced by her knowledge, or lack of knowledge of this subject. Hundreds of educators have tried to solve the perplexing problem of what is best to teach our girls. Surely, the claims of domestic science and household economy should be emphasized.

A woman should be capable of managing a household, and therefore should serve her household with food that will not only sustain life, but will enable the body to perform its functions, nourishing the brain as nature and occupa-

tion demand.

The modern stock farm has given us most of the scientific knowledge we possess on the food question. It is absolutely necessary that the farmer should know what kind of food, and in what proportion to feed his stock in order to receive the best results. Shall the human animal be considered of less importance? No, women have not realized the importance of science applied to household affairs, but "The time has come when we must have a science of domestic economy, and it must be worked out in the homes of our educated women. A knowledge of the elements of chemistry and physics must be applied to our daily living if we are to see the best development of the race."

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