

CHAPTER XXII.

PROBLEMS OF FOOD ECONOMY.

THE problems that center around the question of food and health are many and varied. Diet has in the past been considered too much as a single problem, and any man who had a new or good idea concerning foods was inclined to offer it as a sole requisite to the healthful diet. With the progress of science these narrow views have found their place in the larger science of dietetics, and are now recognized for the partial truth they contain.

Many of these seeming disharmonies have, with further light, been shown to be only different aspects of the same general problem. Dr. Wiley, while doing a great work, for a long time was content to consider foods wholly from the standpoint of their purity.

The orthodox government chemists have considered foods chiefly with respect to their total calorie content and their percentage of protein. These long quoted authorities have been proved to be absolutely in error in advocating a high protein diet when the chief trouble with the American diet was that the protein was already too great.

Vegetarianism has, in its opposition to excessive meat eating, set forth a great dietetic truth, though the reasons given against meat were not always the correct ones.

The science of cookery taught in the domestic schools of the country has been largely based upon the chemical analysis of foods, and thousands of young women have been drilled in laborious calculations of protein, carbohydrates, fats and calories, to a degree of accuracy that was entirely unnecessary and fruitless of practical results in either health or economy.

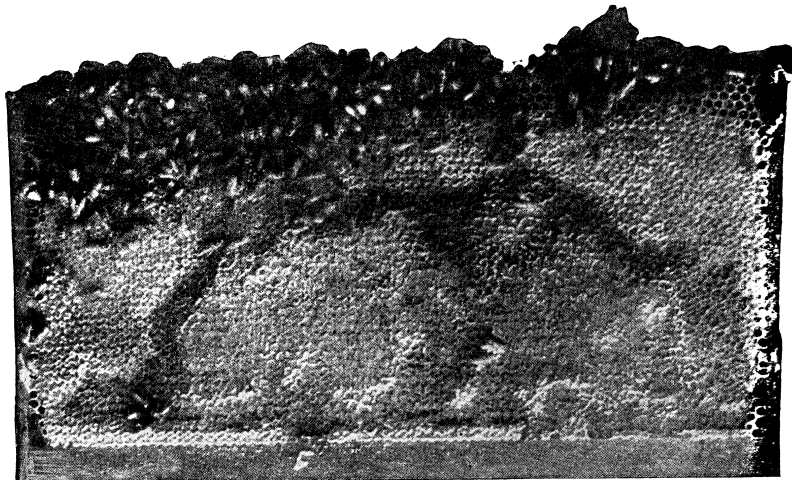
COST OF LIVING.—The cost of living has been the phase of dietetics that has had the largest appeal in the newspapers, but the solutions offered have usually been to eat rice, cheap meat cuts and various left-overs. Such a program of diet economy

is an insult to our intelligence. There should be no left-overs; as for cheap cuts of meat, to eat them may help the individual to economize, but it will not create any more meat in the national larder, but only raise the price of cheap meat, and lower the price of the now expensive cuts—thus taking money out of the poor man's pocket and lowering the food bill of the rich.

The advocacy of the importance of flavor in food, while long recognized economically by the greater price at which highly flavored foods are sold, has not had orthodox backing until recent years, when at the hands of Horace Fletcher and others it began to receive its proper attention.

The claim for a natural diet has always been a leading idea of intelligent health writers, and has of recent years received scientific backing in the discoveries concerning the necessity of mineral salts, the value of vitamins, and the necessity of a proper balance of acidity and alkalinity in our daily menu.

Without pretense at having been an oracle of truth, or miraculously escaping error, it is not without pleasure that



Photograph by Doubleday, Page & Co.

A honey-comb in its natural state, with the bees that produced it.

the writer can look back over the long existence of *Physical Culture Magazine* and realize that its dietetic teachings have been very closely in harmony with scientific facts recently brought to light. The present views favoring low protein are quite in harmony with vegetarianism; undenatured foods which we have long advocated are now shown to contain the essential salts and the vitamins, besides which the importance of a natural appetite to digestion has received high endorsement. These are a few instances where the dietetic teachings of Physical Culture have been vindicated by the recent progress of science. Authorities like Dr. Wiley, the authors of government bulletins, orthodox physicians writing on food, all of which twenty years or so ago wholly ignored the Physical Culture teachings, are today writing food literature closely in harmony with the views which I constantly advocated.

The United States government has copiously issued food bulletins for the dietetic education of the American public. These publications have not only been widely distributed, but have formed the basis for the text-books and teachings of the domestic science courses of our schools.

But the government's entire program of popular food education has been woefully handicapped by a purely theoretical conception of the foundations of food science that rests upon laboratory chemistry, rather than upon direct study of the effect of food upon men.

EARLY FOOD CHEMISTRY.—The early food chemists, in their efforts to analyze foods, found such a hopelessly complex array of chemical substances, that they simplified matters by dividing the substances into groups which could be chemically detected by comparatively simple means. These chemical groups, which have for years been considered the orthodox grouping for food analysis, were as follows: Water, Protein, Carbohydrates, Fat and Ash.

The above grouping was selected because it permitted of the adoption of a feasible method of analysis rather than because there was any evidence that the analysis of food into such components would furnish us with knowledge that would

solve the problems of human dietetics, and enable the average man or woman to gain increased efficiency from their daily bill of fare.

Briefly, the methods of these analyses are as follows: The percentage of water in the food sample is determined by drying the sample in a stream of warm hydrogen.

The protein is found by analyzing for the element nitrogen, protein compounds in food being the only ones containing nitrogen. The term proteins may include widely different substances, some of which are deadly poisons, others highly essential nutrients, while yet others are inert substances, both useless and harmless.

The chemist next proceeds to determine the amount of fat present by dissolving it out with ether.

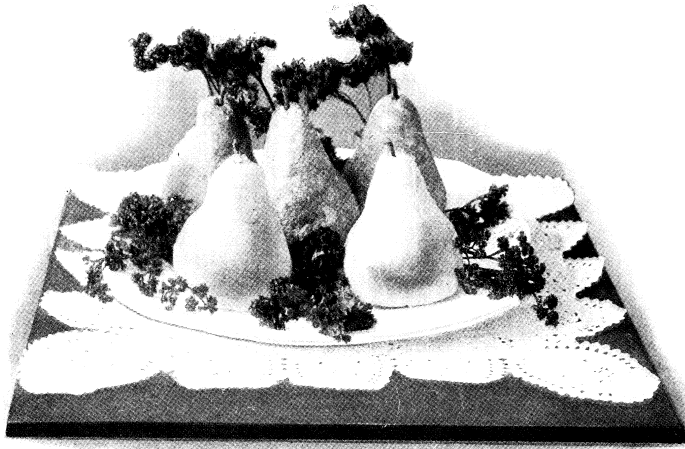
The ash is now found by burning the food sample at sufficiently high temperatures to destroy all the organic or carbon compounds. This determination of ash is of little significance from a dietetic standpoint. In the first place, a grain of utterly worthless sand or other impurities will thus register as ash along with organic phosphorus or iron compounds, the presence or absence of which, even in minute quantities, may determine matters of life or death.

After the above analyses have been made, the chemist usually subtracts their totals from 100, and calls the remaining figure the percentage of carbohydrates. As in most of the other food groups, the carbohydrates so found may contain essential, useless or harmful substances. The most soluble fruit sugars register as carbohydrates, along with the indigestible cellulose—yet the human body may need cellulose even more than it needs the sugar, for it utilizes each for a very different purpose.

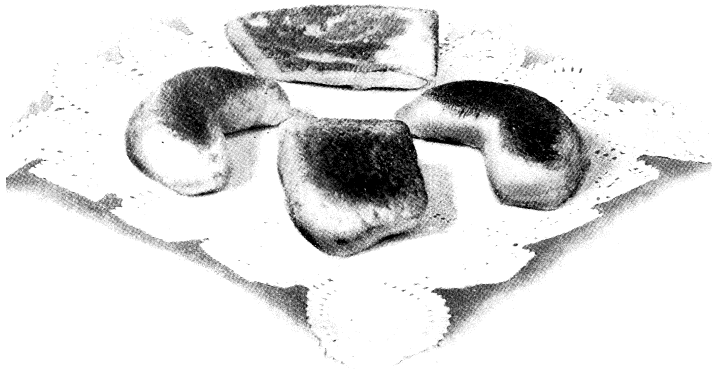
A last step in the work of the analytical food chemist was the determination of the number of calories or heat-producing units.

The chemist now had a series of analyses of the various foods showing the percentage of water, protein, carbohydrates, fat and ash, and the number of calories per pound. The next task

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Mashed Potato Pears.—Boil as many large mealy potatoes as necessary. When done mash thoroughly, moisten with milk, add one tablespoonful of butter and mold into pears, using cloves for stem. Garnish with parsley before sending to the table. Cold boiled potatoes may be used up in this manner.



Cheese Pockets.—A half a pound of pot cheese (any fresh white cheese will do), two cups of flour, a quarter of a teaspoon of salt, three eggs and enough milk to make a dough that can be rolled out to a thickness of one-quarter inch. Mix the cheese with one egg, use the other two for the dough.

was to find what to do with all this highly interesting information. Obviously, if he but knew the amounts of these food elements required by the human body, it would then be possible to prescribe a dietary containing so much protein, carbohydrates, etc., thus finding a use for the result of all this laboriously derived information.

But no one knew how much of these elements the human body required. Means of determining the proper amount of food for animals could be estimated pretty accurately by experimentation, but the perfect diet for human beings was harder to establish because human life was too highly valued to be experimented upon as one can with pigs and chickens. Hence, the food chemist, not being able to determine experimentally the minimum, maximum or optimum chemical requirements of the human body, resorted to the expedient of determining how much of these food elements various types of people did eat in their ordinary course of three square meals a day. The resulting figures, especially those derived from American sources, showed the most bountiful consumption of meats, hence of protein, which is a predominating substance in meat foods. From this point on, the reasoning of the government food chemist became quite simple. Working for the American Government, they were perforce extremely full of American patriotism. Reasoned they: First, the American citizen eats more food, and especially more protein food, than any other people in the world. Second, the American people are the most vigorous, intelligent, civilized and important people on earth, hence the enormous supply of ham and eggs they eat must agree with them or they would be sickly, stupid, puny, etc.

Thus, dietary standards were made up wholly oblivious to the fact that the chief fault of the diet of a prosperous people is that of over-eating on things that seem good to the pampered palate. Instead of becoming a corrective factor, *the government food science encouraged the existing evil tendencies in the American habits of eating.*

FOOD SCIENCE ADVANCE.—Within the last fifteen years great strides have been made in food science, much of which

has been done by the unofficial efforts of private investigators. Among other things, we have learned that what men do when left to their own blind folly, and what men should do, are as different in the business of eating as in other phases of human existence.

Of late years there has been a growing suspicion on the part of practical dietetic workers that the protein, carbohydrates and fat system of analyzing food was thoroughly impractical as a basis for applied dietetics. It was a case of telling too much and not telling anything practical. To really follow a standard calling for certain amounts of protein, carbohydrates and fats makes the planning and preparation of the daily meals a task in computation hardly less formidable than the work of an astronomer in calculating an eclipse.

So much more fond are we of preaching abroad than of practicing at home, that it is safe to say that not one in a hundred food chemists and dietetic text-book writers knew or cared how much carbohydrate, protein and fat were served upon his own table.

It is not without a smile that we observe that in the case of feeding domestic animals, notably chickens, the government food chemists elaborated a similarly impractical system to the one set forth as a guide for human nutrition. But the poultry feeder must be practical or fail in business, whereas there are too many factors entering into the final success or failure of the human being for the results of good or bad feeding to be so directly observable.

The carbohydrates, fat and protein system of poultry feeding is still published in the poultry bulletins and text-books, and accepted in good faith by the city man who buys a chicken farm and prescribes food for hens as seriously as a young doctor plans the composition of pills. But the poultry growers who have been all their lives in the business received the government bulletins in good faith, made fair test of their workings and discarded them for a simpler system of food prescriptions which is more practical and is in general use on successful chicken farms today.

This system of poultry feeding is one which groups the foods into five groups. This grouping is made in a common-sense way and depends upon the origin of the foods rather than upon detailed chemical analysis. The poultry man thinks of chicken feeds in the following natural groups: 1, Water; 2, Grain; 3, Greens (or succulent vegetables); 4, Meat (or animal protein); 5, Mineral (or grit). The poultry feeder learns what proportion of the above groups his fowls at various ages and conditions should have, and he proceeds to provide these from the most available source in each group. On the Pacific Coast he feeds wheat, while in the East he feeds corn. On the sea coast he feeds fish scrap for meat, whereas inland, packing house meat scrap is used, or in dairy districts, skim-milk. The green foods used may be alfalfa, rye, kale, or any of a dozen others that are cheaply produced.

The poultry man recognized that there is the problem of variety in food forms. Chickens have appetites that must be catered to, though they are less whimsical than the appetites of humans, for appetites are largely of mental origin. This system of chicken feeding applied with common sense is practical and successful. It results in the fowls receiving the essential food elements required for their nutrition, without involving the owner in chemical calculations. It was not so much a question of the chemist being wrong, but for practical use their systems are superfluous.

Serious errors in human dietetics are very common, and become more common the further humanity is removed from the natural selective instincts developed in the early stages of human evolution. The instincts were never entirely right, but they were sufficient to enable the human race to survive. But with the progress of civilization, foods are elaborated and disguised, and human habits so changed that the primitive instincts of food selection become nullified by artificial tastes and artificial habits; hence, we must have some sort of intelligent food guidance to bring us back to an adequate diet. Moreover, there is no reason why it should not be possible for science to improve on nature in matters of diet, as has

been accomplished in numerous other phases of human affairs.

The investigation of food chemistry is all right in its place, but in addition we need an every-day system for balancing the diet which would remedy the common errors into which humanity is prone to fall, without troubling the individual with a mass of chemical technology which he cannot understand.

In an effort to enable people to plan their diets in a simple yet efficient way, and to consider at once both health and economy, the Food Department of Physical Culture worked out a plan of considering all foods in the following five natural groups: Cereals, Sugar, Fat, Vitamines, and Animal Protein. About the same time, the government experts at Washington independently worked out and published a food group system that was remarkably similar, differing in fact only in the naming of one group and in the placing of a few items.

The Physical Culture grouping of the various foods is shown in the table giving the detailed wheat-pound figures. This table you will find in Chapter XIV. I give below an extract from a government bulletin which shows their essentially similar system of classification, and explains the use of the system. It will also be interesting to the reader to compare these similar systems with the food groups as worked out by McCollum and stated near the close of Chapter XVII. The chief distinction of McCollum's grouping is the placing of milk in a group by itself. The importance of milk in the diet is such that it really belongs in several groups. For simplicity we retain it in the animal protein group, where it should be considered the most important item. The physical culturist will in fact draw all his animal protein from milk, milk products and eggs, and hence have no need to consider meats as a separate group.

GOVERNMENT FOOD GROUP PLAN.

If the housewife will group the various foods in her pantry, vegetable bins, and refrigerator into five simple groups and will see that foods from each of the groups appear in each day's meals, she can feel sure that she is giving her family the eight

different substances which the body needs for well-being. This grouping will help the housekeeper who wishes to save money or time to simplify her meals without making them one-sided or incomplete. It will enable her to determine whether the meals supply all the different materials needed and will prevent substituting one food for another which has an entirely different use.

Group 1.—Fruits and Vegetables.

Without these the food would be lacking in mineral substances needed for building the body and keeping it in good working condition; in acids which give flavor, prevent constipation, and serve other useful purposes; and in minute quantities of other substances needed for health. By giving bulk to the diet they make it more satisfying to the appetite.

Foods Depended on for Mineral Matters, Vegetable Acids, and Body-Regulating Substances.

FRUITS.	VEGETABLES.
Apples, pears, etc.	Salads: lettuce, celery, etc.
Berries.	Green peas, beans, etc.
Oranges, lemons, etc.	Tomatoes, squash, etc.
Bananas.	Pot-herbs, or "greens."
Melons.	Potatoes and root vegetables.
Etc.	

Group 2.—Meat and Meat Substitutes.

These are sources of an important body-building material, protein. In the case of children, part of the protein food should always be whole milk.

Foods Depended on for Protein.

Milk, skim-milk, cheese, etc.
 Poultry.
 Eggs.
 Meat.
 Fish.
 Dried peas, beans, cowpeas, etc.
 Nuts.

Group 3.—Foods Rich in Starch.

Cereals (wheat, rice, rye, barley, oats, and corn) and potatoes (white and sweet). Cereals come near to being complete foods, and in most diets they supply more of the nourishment than any other kind of food. It is not safe, however, to live only on cereals.

Foods Depended on for Starch.

Cereal grains, meals, flours, etc.
Cereal breakfast foods.
Bread.
Crackers.
Macaroni and other pastes.
Cakes, cookies, starchy puddings, etc.
Potatoes and other starchy vegetables.

Group 4.—Sugar.

Unless some of the fuel is in this form the diet is likely to be lacking in flavor.

Foods Depended on for Sugar.

Sugar.
Molasses.
Sirups.
Honey.
Candies.
Sweet cakes and desserts.
Fruits preserved in sugar, jellies, and dried fruits.

Group 5.—Foods Very Rich in Fat.

These are important sources of body fuel. Without a little of them the food would not be rich enough to taste good.

Foods Depended on for Fat.

Butter and cream.
Lard, suet, and other cooking fats.
Salt pork and bacon.
Table and salad oils.

Some food materials really belong in more than one group.

Cereals, for example, supply protein as well as starch; potatoes supply starch as well as the mineral matters, acids, cellulose, and body-regulating substances, for which they are especially valuable; and most meat supplies fat as well as protein. The lists given above show some of the common food materials arranged in these five groups, according to their most important nutrients. Thinking of foods as belonging to these groups should help to prevent two mistakes—that of serving meals that have not sufficient variety, and that of cutting down in the wrong places when economy of time or money is needed.

The groupings will help the housekeeper who wishes to save money or time to simplify her meals without making them one-sided or incomplete. For example, from these groups, the housewife who has been serving bread, potatoes, and rice or hominy in one meal, will see that one or even two may be left out without omitting any important nutrient. They will show her that a custard which is made of milk and eggs, two foods from Group 2, would hardly be needed after a meal in which a liberal supply of meat had been served, and that a child does not need milk at the same meal with an egg or meat. It will suggest that baked beans or other legumes, or thick soups made of legumes, are substitutes for meat rather than to be eaten with meat.

If, by studying these groups, the housewife finds that she has provided tissue-building protein (Group 2), and the necessary though small amount of tissue-building minerals and body-regulating materials (Group 1), she may safely build up the bulk of the diet from whatever materials from the other groups that seem economical, wholesome, and appetizing.

This method of planning prevents substituting one food for another which has an entirely different use. In general, economy within each group is safer than using an inexpensive food from one group in place of an expensive one from another group.

GROUP PLAN FLAWS.—The trouble with this government system is that it does not go far enough. Certainly it is a great improvement over the old carbohydrate, fat, protein teachings,

where one was supposed to calculate the elements in each food, an impractical proceeding. But the new plan fails utterly to tell how much of each of the new food groups to use. Shall the housewife spend an equal amount for foods of each group, or buy equal weights of each group, or is it merely sufficient to use some of each group of foods and leave the proportions to chance? A little thought will show that neither health or economy will be materially helped by a mere insistence of considering foods in their essential groups without some guidance as to the proportions of each group to be used.

In an effort to rectify this obvious deficiency I have made an effort to determine the approximate proportions of foods to be derived from each group. The sources of information from which we can start to determine such a proportioning of food, are: First, the total amount of food available in the nation; second, the amount of food selected from these five groups by various individuals; third, the amounts of nutrition of various sorts needed by the body.

America's gross production of cereals, especially of corn, is far in excess of what could be used by us as human food. A diet proportioned on the *total* American production of food products would be quite unbalanced.

Fourteen dietaries (ten of which were submitted in the Physical Culture Low Cost of Living Contest) were averaged and showed the following percentages by food groups—the figures are in wheat-pounds, not pounds.

Cereal group	36 per cent.
Sugar group	12 " "
Fat group	15 " "
Vitamine group	18 " "
Animal protein group.....	19 " "

A diet based on the total American food production would contain eighty-four per cent of the cereal group, which would be both unbalanced and unpalatable. But by taking the same proportion of cereal foods used in the fourteen dietaries, and drawing upon the other groups in proportion to their actual availability in the food supply of the nation, we would have a dietary containing the following proportions.

Cereal group36 per cent.
Sugar group16 " "
Fat group20 " "
Vitamine group12 " "
Animal protein group.....	.16 " "

Considering the physiological need of nutrition, the nation's food supply and the matter of personal economy and palatability we derive the following ideal proportioning of the diet among the five groups:

Cereal group50 per cent.
Sugar group10 " "
Fat group15 " "
Animal protein group.....	.15 " "

This last grouping may be considered as a proper standard for an economical diet. The proportion of cereals is rather higher than most people used to rich food are inclined to take. Cereals are the cheapest of our foods. One-half of our total nutrition may be safely derived from them, but only when they are eaten as whole grains or whole-grain products. This is important. If white flour and other denatured cereal products are used, the proportion of the cereal group would have to be greatly reduced and the milk and other vitamines and protein foods would have to be increased. The arguments of McCollum and others who appreciate the dangers of a deficient diet are for a greater proportion of the "protective foods" only because they realize the dangers of deficiency that come from the use of denatured cereals. The plan of discarding the vitamines (and minerals) of cereals, and making up for this waste by the use of excessive quantities of more expensive foods is indefensible from the standpoint of either health or economy.

HOW TO SAVE IN FOOD BUYING.—You cannot gain food economy through buying alone or through cooking alone. But you must understand both and relate each to the other. By mastering the art of buying you will learn how to secure more food nutrients for less money, but unless those foods be economically prepared, served and eaten, your care in buying will prove a boomerang, for the economical buying will become a tyrant and the appetite will rebel.

The demand of the appetite and the desire for food must be

the master, and tell you what to buy; for the appetite will only demand economical foods when you have cultivated it with tasty and appetizing dishes made from the economical products. The efficient way is to buy, or raise in your garden, economical foods that will, by their presence, clamor to be used. Then you must find ways to use them. This leads to the searching of your experience and the experience of others to find recipes and dishes that will use these products. All that you try may not find favor with the appetite, but some of them will, and these you will adopt, and their use will demand the replenishing of the stock of economical food products.

When the end of the month comes around, figure up your grocery bill, and see to what extent you have drawn upon the economical and the expensive foods. Some items will meet your approval; others will show extravagance. Now look over your list and see what economical foods you have neglected. Buy a moderate stock of these and again repeat your effort to find ways to use these.

Don't drive appetite, don't make a martyr of your likes and tastes, but prepare new dishes and try them. Some of them will find favor. As you rebuild your food habits in this fashion, you will learn the essential needs of your table so that you can figure out ahead about what you need. Then you can look about for the most economical form and the most economical quantities in which to purchase your supplies.

I do not intend to recommend any particular system of merchandising, but I can at least advise you to investigate for yourself all places to buy food. There is your local grocer, which all local patriotic community boosters will insist on your patronizing. There are also, if you live in or near a city, the local department stores which usually carry rather high grade goods and charge accordingly. Lastly, there are the great mail-order houses, which now have stores located to cover practically the entire country. These great systems of merchandising have made wonderful progress and the rise in the cost of living during the war was said to have enormously increased their grocery business on account of their fair prices.

Spaghetti Timbales.

—Butter small cups well and sprinkle them with bread-crumbs. Now take some cold-boiled spaghetti, and beginning in the center of the cup, coil it around and around till the cup is filled with the spaghetti. Break an egg into the hollow formed, add salt, and set the cups into a pan of hot water. Put the pan into the oven for a few minutes until the eggs are set. Turn out on a hot



plate. Many like a drawn butter sauce served with the



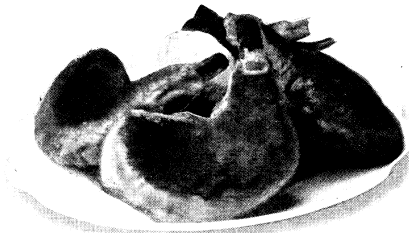
Vegetable Fish with

Tomato Sauce.—Soak a half-pound of lentils over night. Next morning put to boil until very tender with just enough water to cover them. When water boils away add more, a little at a time, so that there will be but little liquid left when done. Strain off all the liquid; then rub the lentils through a sieve; spread the pulp on flat plate to cool and harden. When firm add one

beaten egg, seasoning to taste and enough bread-crumbs to enable you to mold the mixture. Shape as nearly as possible like a fish (see illustration), using a large raisin for eye. Brush with beaten egg and bake in moderate oven from twenty minutes to half hour, basting frequently with melted butter. Serve hot, with tomato sauce.

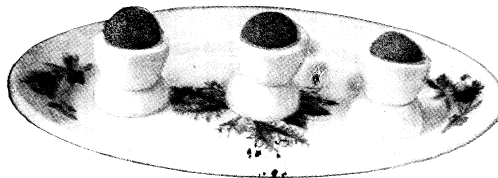
Almond Cutlets.

—One-half pound lima beans, two ounces almonds, two eggs, one teaspoonful of butter. Rub the cooked beans through a sieve and add to them the almonds, which have been blanched and run through a food-chopper. Beat one of the eggs and add to the mixture with a pinch of salt; mix thoroughly. Now add the butter (melted) and enough bread-crumbs to enable you to mold the mixture into desired shapes. Divide into about six portions, shape each one like a cutlet, dip into egg, then crumbs, and fry in butter or bake in the oven. A stalk of celery or parsley may be stuck in each one for the bone in the cutlet. Serve with sauce.



Stuffed Eggs.

—Hard-boil as many eggs as needed. Cut in half carefully and take out the yolks without breaking the whites. Mash the yolks very fine and add to them one small onion grated, salt to taste, some chopped parsley and enough melted butter to make a consistency soft but firm enough to permit molding into tiny balls. Replace into the whites and serve.



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If you are inexperienced in mail-order buying you should be cautioned against selecting the very cheapest grade of goods offered, for that may cause you to become disgusted and repudiate the whole system. Sugar is sugar, but when it comes to syrup or herring, the lower grades are inferior in quality, and even for economy it pays to select your stock from the better priced grades in the mail-order catalog.

Even if you are to purchase most of your foods locally, it will pay you to keep an up-to-date mail-order grocery price list in the house. Then you are in position to see to it that the local grocer does not overcharge you. An instance in point, and not at a cross-roads grocery either, was noted in purchasing foods for the Physical Culture food laboratory. These supplies were bought from a large New York department store. For the most part, the prices seemed reasonable enough, but a half pound of walnut meats were charged at 49 cents. Comparison with a Chicago mail-order catalog showed walnut meats at 59 cents a pound. One of the tricks of the local department store is to sell certain staples at a low price and add ridiculous profits on the items that are less frequently purchased. The mail-order companies have a more sensible system of trading, as they make no claim of offering goods at "less than cost," and yet can be depended on to sell all goods at a moderate profit.

A further advantage of possessing such a food price list is that it will enable you to make out a list of current food prices at their real *cost per wheat pound*. Take your catalog and copy down a list of the staple foods you use most. Where prices are stated in other quantities, reduce them to the pound basis, which is feasible as the net weights of the food packages are always stated. Now consult the wheat-pound table on page 357 and set after each food the wheat-pound factor. In a third column multiply the prices by the factors, and thus get your price per wheat-pound.

Package foods are rarely sold as cheaply as the same foods in bulk. But packages are convenient, and, with the present law requiring the printing on the package of the net weight of

the contents, there is no occasion for your being cheated by the package system. But the government cannot prevent you being cheated if you do not use the information which the law insists on being put there for your protection.

When you buy package foods note the net weights. If you purchase a package of oatmeal for fifteen cents, and the net weight be one pound, ten ounces, figure it out and find that you are paying nine and a half cents a pound. If the bulk price is eight cents per pound and you use ten pounds of oatmeal a month, you can figure your month's saving from bulk purchase at fifteen cents and can judge whether the saving is worth the difference in quality or convenience which the package purchasing will give you.

There is nothing fundamentally wrong with the package system of selling foods. If the packages are not too small and not too expensive, the system may represent the most economical way to sell the food. The sugar trust has adopted the package system, and the small cloth sacks which they put up probably represent no more expense, considering the wholesale process of weighing and sacking, than does the worth of the paper sack, the grocer's time and your time, and perhaps the time of a line of waiting customers. The sugar sacked at the factory is honest weight and is sold at a price that varies but little from the bulk retail price. The sugar trust did not dare use the package system as a means of boosting the price because the public had so long purchased sugar by bulk that they would not have stood for such price boosting. It is the abuse and not the legitimate use of the package system that has called forth the criticism of the food economists. It is the small package and the fancy package and the much advertised package that are chiefly at fault. If you want to get some idea of the legitimate advance in the price per pound for the small package of food, consult again the grocery catalog from one of the large mail-order houses which list foods in packages of all sizes from the small fancy cans and bottles up to hundred-pound sacks.

LOWER COST IN QUANTITIES.—You will find this principle

running through all food selling as through trading everywhere, that the greater the quantity purchased at one time the lower the cost per pound. Foods that keep well may then be purchased in fairly large quantities. So far as possible, these foods should be bought in the wholesale packages. Sugar, for example, may be purchased by the hundred-pound sack, and apples by the bushel instead of by the dozen. Farmers may save in this fashion more easily than city buyers. People in crowded city apartments claim they do not have room to store food, yet a thousand pounds of dry, non-perishable food would only take up a space of twenty cubic feet, a space two by two by five feet, no more than the size of a couple of trunks, and buying foods in large units will work a saving of from ten to fifty per cent and pay enormous dividends on the value of the space required to store them.

By a little thinking and planning, a little shifting about of the furniture, and placing of some boxes or shelves or mouse-proof bins under a table or behind a cupboard, you can find room for storing sufficient non-perishable foods to enable you to purchase them in the larger and more economical sized packages. Your grocer around the corner may be astonished at your change of habit; he has so long been weighing out that pound of sugar, and getting down that small size carton of corn meal, that he will argue gravely against your seeming desire to hoard food. Yet he has been charging you for this foolish service, and the wasted labor of a delivery boy trotting endlessly to your door with a few days' allowance of non-perishable foods that you might just as well purchase in the size package in which he buys it. If he will not accommodate you and insists on charging small quantity rates for large-sized orders, then go to a large grocer, a wholesale or mail-order house, that will sell you at large quantity prices. Even package foods, as package cereals, and canned goods may be purchased by the dozen or by the case.

The package-food industry has grown up because of this improvident habit of wasteful small purchases. The arguments for the small package's greater purity are largely advertising

talk and used to cover up the enormous profits made possible by such a system. During the war, when corn meal was worth five cents a pound in quantities, it sold for seven cents a pound in bulk, and at fifteen cents for a neat paper carton, containing a pound and a half. Fifteen cents is such a small amount that most of us pay it uncomplainingly—yet it was ten cents a pound, just double what the meal was really worth. Cotton-seed oil likewise was worth a dollar and a quarter a gallon, yet when purchased in ten-cent bottles sold at the rate of over two dollars a gallon. Such are the prices we pay for the small package, the endless running to the store, and the grocery boy's forever knocking at the door with endless little glass and pasteboard packets for which we are paying handsome profits under the guise of convenience, which isn't convenience at all, but merely stupid, expensive trouble, all because we are too lazy to think and plan for our future needs.

Here are a few of the foods that one may purchase in quantities and which will keep for many weeks or months, if need be, and these foods should make up from fifty to ninety per cent of an economical dietary.

1. Cereals, if kept sealed.
2. All oils and cooking fats.
3. All nuts.
4. All dried fruits.
5. Sugar, syrup, and honey.
6. Cured meats, like dried beef or bacon.
7. All canned goods.
8. Dry beans and peas.
9. Eggs in the cheap season, to be put down in water glass.
10. Smoked, dried, and canned fish.
11. If one has a cellar—potatoes, apples, and many other vegetables.

Speaking from a fairly large experience in handling problems of food economy, I advise the calculating of the economy of the diet by totaling the foods as purchased in a week or month, rather than by keeping track of foods as cooked or served. From the financial standpoint it is the food we pay for,

and not the food we eat, that counts. The eliminating of waste between the grocery bill and what cleaves to the ribs is quite a different problem. If one buys carefully and avoids waste, the inaccuracy in figuring one's diet from the grocery bill will be less than the inaccuracy that would occur if one attempted to estimate it by weighing ready-to-eat dishes, and the latter method would involve immeasurably greater labor. Foods, as purchased, vary widely in composition, especially meats, but calculating foods as served is still less accurate for the reason that every cook has a different twist for the recipe and the process of cooking greatly influences the percentage of water.

Do not attempt any elaborate system of bookkeeping, but have a hook on which to hang from day to day your grocery bills or other slips recording food purchases. See to it that you buy everything by the pound and that the number of pounds as well as the price are recorded on these slips. Milk may be recorded by the quart and eggs by the dozen, as these quantities are easily figured in pounds when you make your monthly total.

If you buy other foods by the dozen, the piece or the bushel, find out what the items weigh. A kitchen scales is highly desirable both to check the honesty of your grocer and to weigh up foods that you cannot buy by the pound. But if you have no such scales, make the grocer weigh up such foods until you learn how to translate his quantities into pounds.

On your food slips record, whenever possible, the net food weights—the portions you will actually eat. All tables in this work are based on the edible portion of the food. In the following section are given the percentage of refuse in the principal foods that of necessity are purchased with refuse or waste portions. Thus, if your monthly purchases show ten pounds of bananas you must subtract thirty-five per cent for waste, giving you 6.5 pounds net. All food economy figures should be based on such net weights.

PERCENTAGE OF FOOD WASTE PURCHASED.—Meat waste includes bone and often surplus and inedible fat. The refuse from bones runs about 20 per cent in chops. The waste in poultry is large, running from 25 per cent in old fowls to 45

per cent in broilers. Fish waste is considerable, varying from 30 to 60 per cent on the whole fish as purchased. The fact that fish as shown in the shop have a cheaper price tag than meat does not indicate that the real price is lower. The waste of fruits and vegetables run from nothing for berries up to 50 per cent for cantaloupe. Orange peels are about 30 per cent of the weight as purchased. Bananas have a waste of 35 per cent. In these cases the peels are thick and quite unedible, but in the case of fruits like apples and pears or vegetables like potatoes, the peel is very thin, and becomes a source of consequential waste only when we employ the clumsy system of removing the skin by cutting off part of the substance. A large amount of good food is thus wasted, including most of the valuable mineral elements. Baking potatoes "in the jackets" also means a loss (if the jackets are not eaten), since much of the meat of the potato sticks to the stiffened skin and is discarded.

Potato skins are not bad eating, and serve the same dietetic purpose as wheat bran, the mineral elements being digested and the cellulose serving to give the bulk to the intestinal residue and preventing constipation. If you cannot accept this idea of eating the skins, you may adopt the plan of dropping the washed potatoes into a vessel of boiling water and allow them to remain ten minutes. Remove, rinse in cold water, and strip the thin skin as when potatoes are peeled after thorough cooking by boiling. The potatoes will still be practically raw and may be handled like raw peeled potatoes in further cooking. Best of all, such potatoes may be baked when they will crust over with a delicious golden brown skin. Such baked potatoes are entirely eaten, avoiding the unsightly waste of baked potatoes as usually served.

Buy a fireless cooker and use it. The fireless cooker saves fuel, it prevents heating up the kitchen, and it eliminates the worry from fear of food sticking and burning. The fireless cooker may be used for any food that is to be stewed, steamed or boiled.