

GOOD FOOD AND HOW TO GET IT

AN INTERNATIONAL REPORT ON
FOOD PURITY, FOOD VALUES, AND
THE CO-OPERATIVE MOVEMENT

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INTERNATIONAL CO-OPERATIVE WOMEN'S GUILD

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Good Food and How To Get It.

An International Report on Food Purity, Food Values, and the Co-operative Movement.

THERE can be no more important question for co-operative women to consider than that of food purity and food values. In the first place, it is a subject of very special concern to the co-operative movement. To give pure and wholesome food to the people was one of the original objects of the Rochdale Pioneers. But the co-operative movement can do more than give pure food to its members. It can be a great pioneer in building up the health of the people by providing those foods which have the greatest life-giving value. It is very important that it should keep abreast of scientific knowledge on the question of food, so as to adapt its methods and productions accordingly.

Secondly, this is especially a woman's question, for it is women who are principally concerned with the buying and preparing of food. In spite of legislation to protect the consumer, too much of our food is not what it claims to be, and too often women buy something because it is cheap or looks nice in ignorance of what it really is; or they buy it because it is the fashion to eat this or that, and they do not know that such food contains very little nourishment. If women want pure and good food they must learn to know what kinds of food are the most nourishing and to recognise inferior or adulterated goods.

The question of food purity and food values is also one of great public interest, both nationally and internationally, for it lies at the foundations of the people's health. Every nation has taken measures of some kind to protect the purity of its people's food. Practically every nation, too, is interested in the food trade, either as an importer or exporter of food, and this raises the international aspect of the question. A report of the Royal Sanitary Institute of Great Britain refers to the fact that much imported food gets spilled at the docks, and that when prevented from restoring these dirty "sweepings," as they are called, to the sack, traders endeavour to ship them to the Continent! The report of the Swiss Co-operative Union for 1925 mentions that the great majority of samples of food found by their



laboratory to be adulterated proved to be of foreign production, usually from countries with a low currency. American apple-growers sprayed their trees with arsenic insecticide, and consumers in London suffered from arsenic poisoning. All these things happen in spite of the regulations and supervision of the importing country, and show how necessary it is that this question should be studied from an international standpoint, with a view to the collaboration of all countries to maintain the purity of the world's food supplies.

The whole subject is an enormous one, and it is not possible in a short report to cover the whole ground or go in detail into the position in each country. It will be convenient to consider first the question of food purity, and then that of food values, although it must be remembered that these necessarily overlap. Food that has been adulterated is seldom of equal food value with the genuine product, while on the other hand modern knowledge shows that the processes used to purify some foods really deprive them of some of their nutritive qualities.

FOOD PURITY.

There are four main ways in which to-day the purity of our food supplies is endangered.

Contamination by Dirt.

Everyone would agree that it is most necessary that food should be produced, kept, sold, and cooked under cleanly conditions, but it is so easy to become accustomed to methods in general use, and so difficult for the general public to see the conditions under which much of their food is produced, that few people realise how much more care is needed in this respect.

Milk is an obvious example, and the question of clean milk has attracted much attention in many countries, for milk is more easily contaminated by dust and dirt than almost any food. Dirt may get into it in the process of milking, unless the cow, the cowshed, the pail, and the milker are all scrupulously clean. When it has to be taken from the country into the town there are many risks of contamination by dust unless it is transported in carefully closed vessels which cannot be opened on the journey. Again dust may get into it as it is poured by the retailer on the streets into the cans or straight into the housewife's jug. Disease germs multiply in milk at a prodigious rate, and dirty milk is a source of great danger, particularly to children, who depend so much on milk. It is for this reason that most countries have regulations, some of them very strict, governing the milk trade, and that the best producers and distributors of milk take great precautions as to its cleanliness.

The poisonous nature of the dirt which may get into milk was strikingly illustrated in the experience of an English co-operative society. The society receives its milk supplies from farmers in the country around, and cleans the milk at its dairy by means of the most up-to-date machinery. Some of the dirt thus extracted was one day thrown out in the yard, where a dozen hens were feeding. The next morning eight of the hens were dead.

The co-operative movement has done a great deal to raise the standard of cleanliness and purity of milk in those countries where societies have taken up the milk trade. Some famous co-operative dairies are those of the Basle Society (Switzerland), the Produktion Society in Hamburg (Germany), the Derby Society (England), and the Franklin Co-operative Creamery at Minneapolis (U.S.A.), all of which do a large proportion of the milk trade of their town. These societies clean and purify the milk and render it free from germs by the most modern machinery, and take the greatest precautions to ensure its reaching the consumer perfectly clean.

The Danish Co-operative Farmers have set such an example of cleanliness in the production of milk that the standard reached in Denmark is the highest in the world, and the Danish law enforcing cleanliness and purity of milk is one of the most advanced. No one suffering from a communicable disease or in contact with an infected person is allowed to be employed in any way in the milk trade. Personal cleanliness and cleanliness of clothing is strictly enforced on all who handle milk. There are special provisions as to the cleanliness and equipment of premises where milk is dealt with, and as to the other goods which may be sold in the same shop. No place where milk is kept may be slept in. It is illegal to pour out or draw milk from a tap in the street. Australia, New Zealand, and the U.S.A. have equally strict regulations, while those of England, Switzerland, and Germany are almost as advanced.

Milk, however, is by no means the only food that is often endangered by dirt. Probably most people have seen bread, cakes, and sweets exposed for sale on counters with the flies crawling over them; and meat, fish, and soft fruit lying uncovered on open stalls or barrows, where not only flies and wasps, but the dust of the passing traffic, settles on them; while in many countries one sees old newspapers or printed posters used for wrapping meat, fish, or fruit, and bread is delivered without any wrapping. Epidemic diarrhoea among children and outbreaks of typhoid fever have been traced to sweets and cakes contaminated by flies. Indeed, so much is infection spread by the ordinary house-fly that scientists suggest renaming it the "Fly of Death." In Australia, Canada, and the United States foods for sale

must be protected from flies, and as far as possible from dust, either by being covered with gauze or muslin or being exposed for sale under glass. In France, Switzerland, and Austria it is illegal to use printed, coloured, or soiled paper for wrapping food. But in many countries these practices are so common as hardly to be noticed. Even co-operative societies are not the model establishments they might be in all these aspects. The provision of glass cases, or glass, muslin, or gauze covers for perishable goods and for sweets and groceries such as tea, sugar, and dried fruit that are sometimes shown in the windows should not be a very difficult or expensive matter.

Much more might be said about the need for cleanliness in the production, packing, and storing of food, and the importance of those who have to handle it being free from infection of any kind. The newer countries like Australia and America try to secure this by obliging all premises where any kind of food is dealt with to be registered so as to facilitate inspection, and to comply with strict regulations as to suitability and equipment of their premises. Switzerland also has such laws, but in most of the older countries these regulations apply only to certain establishments, such as in France, restaurant kitchens, or to special articles of food—for instance, meat in many countries.

Falsification of Food.

In all countries there are many private traders as well as co-operative societies who try to maintain a high standard in the goods they sell. But as long as the manufacture and sale of food, like the rest of industry, is carried on to make profits for the owner of the enterprise rather than to serve the needs of the consumers there will always be a temptation to increase those profits by substituting inferior articles or materials for the genuine thing. In spite of legislation against it, this kind of adulteration goes on to a greater or less extent all over the world.

Any woman who buys an egg would imagine that though it might be a bad one, it was at least an egg. But the Swiss co-operative paper of October, 1926, quoting from *Le Bulletin Officiel de la Ville de Paris*, gives an account of how eggs were found to be manufactured in France. The yolks were made from coloured starch and maize flour, the whites from some chemical substance, and the shells from plaster, prepared and heated in such a way that as the shell congealed the yolk and white grew liquid. A perfect imitation egg was the result!

A report of the Swiss Co-operative Union for 1925 gives some interesting facts about some of the articles of food submitted to their laboratory for analysis. Ten samples of coffee contained foreign substances, such as black beans. One sample of mustard contained particles of burnt wood. A sample of lard contained

textile matter, and another was composed of 60 to 65 per cent lard, and the rest cocoa butter, butter, and oil.

A British Government Report tells the same kind of story. Several samples of sweets were found to contain French chalk. A consignment of 9,000 chocolates was condemned as unfit for consumption because they contained quartz, glass, zinc, copper, and sawdust. Mineral matter was found in four samples of tea, one containing iron filings and pieces of wire nails. Samples of sugar were found to contain sawdust or ground rice.

A report of the laboratory of the German Wholesale of Czecho-Slovakia shows that in 1926 spices and coffee mixtures of private firms were frequently found objectionable owing to the presence of dust or sand, while foreign fats were added to chocolate, and too much fat extracted from cocoa, two out of four samples of the former being reported against. On the other hand, twenty-four samples of Wholesale chocolate were found to be pure.

An official of the Vienna municipality, in an address to the co-operative women, mentioned cases of coffee containing ground roasted beans and cakes containing paper, sawdust, and syrup, but no sugar.

Few women know that nearly all egg powders are little more than coloured baking powder. One brand of egg powder in England labelled as "containing eggs" was found on analysis to contain 1 per cent of egg.

One of the things most commonly adulterated by the substitution of inferior materials is jam as made in Western countries. Jam ought to be made of fruit and cane or beet sugar. In the cheaper kinds, however, glucose is often substituted for sugar, and vegetables or a cheaper kind of fruit for the supposed strawberry, raspberry, or whatever it should be. Glucose is not itself injurious; indeed, it is a recognised food. Neither is it cheaper than sugar. But carelessness in manufacture or inferior fruit may lead in sugar jam to the formation of mould, while glucose conceals these defects. It is also less sweet than sugar, and to prevent discolouring it is usually bleached, which is also objectionable. The fruit substitutes used include marrow, turnips, carrots, and very commonly the pulp left from fruit after the juice has been extracted for wine or cider making. In countries in which cider is made the farmers either dispose of the pulp—including the wasps, straw, and dirt that get into it in the course of the primitive method of cider making!—to the jam manufacturers or, if they cannot sell it, give it to the pigs.

Serious adulteration is commonly found in temperance drinks, such as fruit cordials. Too often no fruit is used at all, its place being taken by citric acid, tartaric acid, or even phosphoric acid with some suitable flavouring.

Other common articles of food often adulterated by the substitution of inferior materials are:—

Bread, adulterated by a mixture of potato flour or by a so-called "improver," which allows the flour to absorb a greater quantity of water, so that the baker can sell water for bread.

Margarine, adulterated by the use of inferior fats or hardened oils.

Sausages, in which other ingredients are substituted for meat.

Coffee and coffee essences, *Sugar*, and *Soup* in cubes or packets.

An inquiry recently made into the food laws of thirty-one countries showed that all these have laws to protect the consumer against adulteration of this kind. Yet it still goes on. Where the penalty imposed is a small one it may pay an unscrupulous trader better to risk prosecution than to sell honest goods.

The co-operative movement, which exists to serve the consumer, and which makes no profits, has no motive for doing these things. It does not sell manufactured eggs, or put filings into its tea, or potatoes into its flour. It describes its goods correctly, and many examples could be given to show their superior food value. An analysis made by the German Wholesale, for instance, showed that their sausages contained a food value of 1,756 calories, as against 1,323 calories in private makers' sausages at the same price. Those Wholesale Societies which have an analytical laboratory, as several have, under the direction of an analyst who is a specialist in food analysis, are particularly well equipped to give their members the best and purest food. Such laboratories can examine periodically the productions of the Wholesale, so as to ensure their satisfactory quality. They can examine competitive productions and see how they compare with those of the Wholesale, and they can act as independent referees in regard to complaints from retail societies about the quality or composition of goods, so as to ensure that justifiable complaints are remedied. Though more stringent legislation or better enforcement of existing legislation against food adulteration is obviously necessary, and should be supported by all co-operators, consumers have a better way of protecting themselves against these frauds than by laws which are difficult to enforce—they can join their co-operative societies.

Adulteration to Improve the Appearance of Food.

Everyone likes the food they eat to look nice. Indeed, it has been said that we eat as much with our eyes as our teeth, and provided it is equally wholesome, food that looks appetising really nourishes us rather more than food that looks uninviting, for we enjoy it more. Up to a point it is quite right for manufac-

turers to pay attention to the appearance of food. But there are two great dangers in trying to alter its natural appearance: (1) The ingredients used to improve the appearance may be harmful in themselves; (2) the alteration may serve to conceal inferior or unsound food. It is almost incredible to what an extent food is artificially coloured in many countries. Cakes and sweetmeats, margarine (sometimes also butter), biscuits, jam, sausages, fish pastes, temperance wines and fruit cordials, and tinned vegetables are among the most common articles of food that are very often coloured.

Tinned vegetables, especially green peas, are an example of the objections referred to above. Unless the very best and freshest peas are used and preserved with the utmost care they lose their bright green colour in the process, and to restore it copper sulphate is used. This is in itself a poisonous substance, and although it has been contended that in the very small quantities used it is harmless, experiments have proved that taken frequently over a long time, it may produce very harmful results. Some doctors even attribute diabetes to this cause. The U.S.A., Australia, Canada, New Zealand, and recently England have prohibited the use of copper sulphate, and Uruguay only allows it in imported tinned vegetables.

Other dangerous colouring matters are many of the coal-tar dyes which have been used in food manufacture. Some of these are poisonous in themselves; others become so in the process of manufacture or through the action of the substances with which they have to be mixed before they can be used. In some colours sold for food purposes, for instance, considerable proportions of arsenic and lead have been found.

The Governments of many countries have forbidden the use of these dangerous colours, and have issued lists of colouring matters which are and are not permitted in food manufacture. As long ago as 1891 Belgium issued such regulations, and many other countries have done so since.

But even if only harmless colours are used there is still the danger that their use may conceal defects which would otherwise be apparent. Sausages, for instance, are often coloured red to conceal the fact that they contain too little meat. Fish pastes are dyed pink to make them look like salmon when really they are not made from salmon at all. The greening of tinned vegetables to conceal the use of stale vegetables and careless methods has already been mentioned.

The appearance of food is therefore not at all a reliable guide to the housewife under modern conditions. Her inclination to choose what looks nice often means that in fact she is getting dressed-up food of an inferior quality, and the demand for a

certain kind of appearance in different articles of food leads manufacturers to consider appearance rather than purity in their productions. Sometimes the appearance is largely a matter of fashion, and has no relation to the real quality of the food, as, for instance, in the demand for very white flour.

Flour is one of the most important of all articles of food; yet in some countries it is one of the most seriously adulterated. Certain kinds of wheat yield a much whiter flour than others, although there may be just as much (and sometimes more) nourishment in the darker kinds. This very white flour became popular on account chiefly of its appearance, and a fashion for very white flour set in. Millers took to bleaching the flour which was naturally darker in order to meet the housewife's demand for whiteness, which she mistakenly supposed to be a sign of superior quality.* Flour is bleached in various ways. One method is to treat it by means of a gas known to millers as "electric gas," produced by passing air over an electric spark, which forms nitric oxide. Other millers use chlorine. Others again add some chemical substance to the flour, usually persulphate or peroxide, similar to what is used in bleaching powders for washing purposes. All the processes have been considered by doctors to be more or less injurious, and if women knew how the whiteness of their flour is often produced they would certainly cease to consider it a merit.

It is women, the buyers of all these things, whose eyes the manufacturer seeks to please when he dyes his cakes or his sausages or bleaches his flour; and it is women who can most effectually put a stop to such practices by learning the facts and insisting less on appearance and more on real food value. We may be quite sure that the co-operative movement, which aims at producing the best and purest food, strictly observes the law on all these points, and would be the first to welcome any fresh legislation necessary to protect the consumer still further. On the other hand, if the co-operative movement is to take a lead, as it should, in this matter, and set an even higher standard of purity than the law demands, it is for the women of the movement to make a beginning. For it is women who create the demand. Flour milling, for instance, is an important co-operative industry in many countries. If women insist on having always the whitest of flour, co-operative millers have to meet this demand or see their customers go elsewhere. Co-operative women must let it be known that they care little for the exact degree of whiteness in their flour and much for its purity. A woman may be unable to afford the best of sausages, but it is far better that she should see at once that she is buying sausages of less meat

* The bleaching of flour to make it white is quite a different question from the relative value of white and wholemeal flour.

and more bread and rice, all pure and wholesome, than allow herself to be cheated by a dye which may mask anything. Women must not force the co-operative movement to pander to an ignorant demand, but support its efforts to raise the standard of purity by insisting on having what is real and good even if it costs a little more or looks a little less attractive.

The Use of Chemical Preservatives in Food.

The growth of large industrial areas into which perishable food has often to be brought from a distance, and kept perhaps for some time in the shops before it reaches the actual consumer, and the dependence of many countries for part of their supplies on food imported from abroad, has necessitated some means of keeping food for considerable periods.

There are three chief methods by which food can be made to keep:—

- (1) By sterilising and placing it in airtight containers, as with jams, bottled fruits, tinned meats, and vegetables.
- (2) By keeping it at a very low temperature, as fish is kept in ice.
- (3) By adding to it or treating it with some chemical substance which prevents putrefaction.

Obviously the first method cannot be applied to every kind of food, and it is sometimes insufficient, and it is often difficult to apply the second. Therefore, in discussing the question of preservatives it is necessary to consider not only whether their use is objectionable in itself, but what would be the effect on food supplies of doing without this means of keeping perishable food. It is a case of balancing the possible harm done with a possible shortage of food supplies in industrial areas.

As in the case of colouring food, the objections to chemically preserving it are twofold—that the substance used may be harmful in itself, and that its use may conceal the fact that the food was already beginning to turn bad, thus making it easier for careless or unscrupulous traders to supply unwholesome food. The smell of decaying meat, for instance, can be removed and its fresh colour restored by treating it with sodium sulphite, one of the preservatives commonly used.

The chief preservatives that are still in common use in many countries are boron, sulphurous preservatives, and benzoic acid. Boron preservatives are used principally for dairy produce—cream, butter, and margarine. One of the methods of transporting eggs, too, is to break them, separate the yolks and whites, preserve the yolks with boracic, and dry the whites. These are mixed again before using, and such "liquid egg" is largely employed for confectionery purposes. Many eggs from China

are exported in this form. Boracic acid is sometimes used in sausages in the hot weather, and packers of bacon for export dust it over with borax or pack it in borax to ensure its keeping on the journey.

In the process of drying certain kinds of fruit, particularly apricots and peaches, burning sulphur is used, and the sulphur dioxide produced is absorbed by the fruit and preserves it. Sulphur dioxide is also used in wines and other refreshing drinks and in jams. In butchers' shops sulphites are used to freshen up stale meat and remove any bad smell. Benzoic acid is used in pickles, sauces, and coffee essence.

There has been much difference of opinion as to whether these preservatives are injurious to health or not. It has been contended by many traders that such minute quantities are used that they cannot have any serious effect. On the other hand, it has been medically proved that boric acid tends to accumulate in the human body, so that if it is taken daily in however small quantities it may eventually prove serious, and butter, margarine, and eggs, in which it is used, enter in some form into the daily diet of most people. For children and invalids boron is known to be harmful; indeed, a woman doctor with an exceptional experience of children attributes certain rather new and obscure diseases among children largely to the increased prevalence of preservatives in their food. It seems clear, therefore, that the use of boron in food is very undesirable, and in Sweden, Japan, some of the States of America, and recently in Great Britain it has been prohibited. Even if the other preservatives used are less harmful, they have the objection of enabling stale food or careless and dirty methods to be used without detection by the consumer, and on this ground alone they should be abolished, if this is possible, without unduly restricting food supplies.

On this point the experience of Japan supplies a sufficient answer. Japan allows no chemical preservative of any kind in any food at all. Now Japan has large industrial populations to feed, and transport difficulties as serious as in many other countries. In some of the States of America also no chemical preservatives are allowed. Moreover, it has been found that the very same goods are made with or without preservatives, according to the laws prevailing in the country of destination. A Government Committee which investigated this question in Great Britain found, for instance, that while New Zealand butter exported to England contained boracic acid, that exported to the United States of America contained none, as it is forbidden by U.S.A. law.

It seems quite clear, therefore, that there is no real danger that the abolition of preservatives need curtail the available amount of food, for what is possible in Japan and America is also

possible elsewhere. Cleanly methods are necessary, sound raw materials must be used, and more provision is needed on ships, trains, and in the shops and warehouses of many countries for keeping food by cold storage methods. And last but not least, the housewife will certainly demand that she also should have the means of keeping food fresh till it is actually eaten, and that in every new house there should be proper larder accommodation. Indeed, with cheap electricity the day should come when a cold store is available in every home.

International Problem of Pure Food.

Enough has already been said to show that the laws of different countries which protect the consumer against impure food vary enormously. Nearly all countries have such laws, yet there are wide differences in their requirements as well as in the methods of control, inspection, &c., used by each country in enforcing its laws. Producers of food for export may have to know the law of a dozen different countries, and adapt their productions according to destination, while there are cases where this difference has made it possible for exporters and importers to evade the law by sending the goods through a third country.

Again there are matters not covered by laws of the exporting country which are very difficult for the importing country to control. A few years ago a sensation was caused in the British Press by the account, published by a Member of Parliament returning from the East, of the horrible conditions under which dried fruits were packed there for the European market. The English C.W.S., which is the largest importer of dried fruits in England, was fortunately able to state that these conditions did not apply to fruit imported by the co-operative movement; but there was no reason to doubt that somebody was eating these filthily packed fruits.

In regard to meat, conventions between some of the importing and exporting countries have been made by which certain Government marks on the goods are recognised as satisfactory evidence that the meat conforms to proper standards of cleanliness and freedom from disease. This kind of international agreement is useful, and saves the duplication of inspection, and with greater uniformity in method in the different countries could be very much extended. But more than that is needed. In regard to such matters as dyes and preservatives or the use of poisonous substances in the preparation of food, general international conventions prohibiting the use of injurious substances and guaranteeing a proper system of supervision over food manufacture would protect both the home consumer and the consumer of imported food. The Health Section of the League of Nations is trying as a preliminary to secure the adoption of

more uniform methods of inspection and analysis by the different countries, which would facilitate such conventions. But it is from the consumers themselves that such a demand must come. And surely it is for the co-operative movement internationally to take the lead in such a matter.

What is Needed.

It is obviously impossible in a report like this to mention separately the measures needed in each country in order to secure the desirable standard of food purity. Some of those suggested will apply to one country, some to another, and it will be for the National Co-operative Women's Guilds of each country to ascertain which are those applying to their own country, and try to get their co-operative movements to take the necessary action. Such measures would include:—

I. CO-OPERATIVE MEASURES:—

(1) Education of the members of co-operative societies in regard to the adulteration of food and the purity of co-operative productions.

(2) Protection from contamination by dust and flies of all goods, such as meat, confectionery, &c., displayed for sale in co-operative stores, and the wrapping of bread by co-operative bakeries.

(3) The establishment by wholesale societies which undertake food production of an analytical laboratory.

II. NATIONAL MEASURES:—

(1) Further legislation ensuring the cleanliness of food production and distribution, and the freedom from infection of those engaged in handling food.

(2) Stricter legislation against the use of injurious substances in the production and preparation of food, whether to preserve, colour, or bleach it, or in the case of raw fruit and vegetables, to protect it from insects or other pests.

(3) Legislation to restrict extravagant and misleading claims which cannot be substantiated by the nature of the article.

(4) Stricter enforcement of existing laws and heavier penalties.

(5) More adequate and uniform methods of inspection and analysis of foods.

(6) To make all these possible, and also to protect consumers against the deliberate falsification of foods, some system for the registration of all places where food is handled, such as prevails in the U.S.A., Australia, and other countries.

III. INTERNATIONAL MEASURES:—

The adoption of an international convention, or conventions, for the prohibition or the limitation of the use of injurious substances in the preparation of food, and for a uniform system of analysis and inspection, enabling food to be certified as pure.

FOOD VALUES.

There have been so many new discoveries in the last few years, so much progress in scientific thought in all departments of life, that it is not surprising that there has been a great advance in knowledge of food values and a great change in scientific ideas regarding the relation of food to health. Food has to do various things for the body. It has to repair the wastage of the tissue; it has to keep up the heat of the body; it has to provide muscular and nervous energy; and it has at the same time to clean out, so to speak, the machinery of the body and keep it working smoothly. To do these things different kinds of food are necessary, and necessary in the right proportions. Protein, which is found chiefly in meat, eggs, milk, and cheese, pulses (such as peas, beans, and lentils), and some cereals, is the body-building material. Heat is supplied by fats and by carbohydrates (starch and sugar), found chiefly in cereals, potatoes, and fruits like bananas; while certain mineral salts, found chiefly in green vegetables, and that part of food known as "roughage," like the bran in brown flour, do the cleaning out of the machine.

With grown-up people much the largest proportion of the food goes to maintain the heat and energy of the body. In a low temperature, or when muscular energy is expended, heat is given off by the body, and has to be replaced. It has been possible to measure scientifically the amount of heat given off under different circumstances, and to calculate the number of heat units which the food necessary to replace it must contain. These heat units are known as calories. Until recently the value of any kind of food was judged almost entirely by the number of calories it contained.

New Discoveries as to Food Values.

But it had long been suspected by some people that there was another something of importance in food, and experiments made just before and during the war showed quite definitely that this something exists. Scientists do not yet know exactly the nature of the mysterious new element or elements in food which they call vitamins, but they have proved that they are essential to life and health though in very small quantities. Three principal kinds of vitamins have been distinguished, which are known as vitamins

A, B, and C respectively. They differ in their effects on the human body, but all are necessary.

Vitamin A is derived from the green parts of plants, and is stored up by animals in the fat of their bodies. The animal fats which are rich in this vitamin are butter, suet, cream, milk, and cod liver oil. It is destroyed by great heat, and for this reason it is not contained in margarine or lard, in the making of which high temperatures are used. Vitamin A is specially necessary to growth, and the absence of it produces rickets, which increased so terribly among the children of those countries which suffered from a shortage of food during the war.

Vitamin B seems to be especially associated with the germ of life. It is found in that part of the grain of wheat, rice, and other cereals which contains the germ, as well as in pulses, some vegetables, yeast, the yolk of eggs, milk, and the internal organs of animals. When the germ of the grain is removed, as it is by modern methods of milling white flour or polished rice, this vitamin is destroyed. White flour may therefore be objectionable not merely because it is bleached, but because it has lost this vital element. Vitamin B is particularly necessary for the growth and maintenance of the nervous system, and its absence leads to the terrible disease of beri-beri, which is common in some Eastern countries where the people live almost wholly on rice.

The third vitamin, C, is found especially in the juice of fruit, as well as in vegetables and milk. It is more easily destroyed than any of the others, particularly by heat, so that much, if not all, is lost by cooking or canning fruit and vegetables and by sterilising milk. Its absence leads to scurvy, from which sailors suffered so much in the old days when they could not get fresh fruit on their long voyages. Babies fed on boiled milk get infantile scurvy unless they are given fresh fruit juices, and insufficiency of this vitamin leads to skin diseases, bad teeth, and poor health generally.

Another factor in food has lately been discovered to be as essential to health as vitamins, though, like vitamins, it is necessary in very minute quantities only. This is iodine, which is present in sea water, as well as in the air and fresh water near the sea, and in the soil of some districts. Green vegetables grown in places where they can extract iodine from the earth and water also contain it, and so do eggs and milk from animals in such places. It is also found in wholemeal bread and bran. But the farther one gets from the sea, the less iodine there is in the surrounding air and water. It has been shown that the drinking water on the French coast contains three times as much iodine as in Paris, while in districts too far from the sea or too much shut in by mountains to be reached by the sea spray, which is carried hundreds of miles by the wind, there is hardly any iodine.

Just as the absence of vitamin A causes rickets, so it is now widely held among doctors that the absence of iodine causes goitre, which is so common in the Alpine valleys, in some districts of America, and in the Derbyshire dales in England, and is associated with the terrible disease of Cretinism—the birth of dwarf idiots. There is no space in this report to explain the interesting reasons that have led doctors to this conclusion, but it seems probable also that deficiency of iodine in the diet is responsible also for other diseases, including, possibly, certain forms of mental deficiency. In Switzerland and some States of America the public health authorities have taken steps to see that the people receive, either through the water supply or in some other way, the right quantity of iodine*; and in England it is given by some public health maternity centres to expectant mothers, for whom it is especially important. But it cannot be taken at random, and there are forms in which iodine is poisonous. It must be taken in the right form and the right quantity. Sea fish provides iodine in the diet, and once people used to get the iodine necessary in the salt that they used, for iodine is often found combined with salt. But here again fashion has deprived us of a valuable element of food. For just as modern milling methods extract the vitamins from flour in the endeavour to make it white, so in getting very white salt modern processes of manufacture extract the iodine.

It is possible to restore this iodine content to the salt, and in some countries "iodised" salt is now on sale, though often at prices that make it prohibitive for the working woman's table. In some cantons of Switzerland, however, iodised salt has to be sold at the same price as ordinary salt. In others, as well as in some of the States of America, none but iodised salt is allowed to be sold.

Housewives and the New Knowledge.

In the light of all this new knowledge the housewife has to revise considerably many of her ideas and habits as to what makes up a nourishing meal. She will certainly no longer consider whiteness any merit, either in her flour, or her rice, or her salt; rather she will be inclined to look upon it with suspicion, knowing that even if it has not been produced by injurious processes of bleaching, it shows that some valuable element has been extracted. She will use as little water as possible and no soda in cooking her vegetables, for she will know that these things destroy the vitamins and dissolve the salts for which we eat green vegetables. Meat and starchy foods will take a less prominent place in her menu, and milk, cheese,

* The cases of goitre among school children in the canton of St. Gallen fell in consequence from 87.6 per cent in 1919 to 13.1 per cent in 1922.

vegetables, and fresh fruit a much more prominent one. She will make as much use as possible of food in or near its natural state, and as little as possible of tinned, bottled, and highly refined or preserved foods.

This does not mean that the housewife must never buy white flour or rice or eat white bread. They are not poisons, as some food reformers would almost lead us to suppose. But if she uses white instead of brown flour or rice she will not only satisfy herself that it contains nothing harmful, but will see that the missing essentials are supplied in some other way. Nor does it mean, as other enthusiasts seem to wish, that she will leave off cooking altogether and feed her family on nuts and oranges! The experience of hundreds of generations has accustomed mankind to cooked food, and taught how cooking can aid digestion, and so contribute to the nutritive value of many foods. What the housewife has to guard against is relying too much on cooked foods, and especially on those wrongly or over-cooked foods such as modern commercial methods often give us.

Other New Discoveries.

But it is not only the housewife who has to take account of these new discoveries if the family is to be properly fed. The farmer and the food manufacturer must take account of them, too. It has been found that vitamins and iodine are just as necessary to animals as to human beings, and that if human beings are to get these essential food elements, the animals on which we depend for food must get them, too.

In a large hospital fifty children were being treated for rickets. They had plenty of milk, which is rich in the vitamin that cures rickets. Yet they did not get well. The doctors made inquiries about the milk supply, and found that the cows from which it came were being fed on cow-cake. Now vitamins seem to be somehow derived from plant life. The cow takes in vitamins with her own food when she eats fresh grass or even hay. When she is fed on one of the many artificial foods which modern methods have produced she gets none, and her milk gradually ceases to contain it.

It has been said that scientists do not know exactly the nature of the mysterious vitamins which are so essential to life. But quite lately it has been discovered that they are very closely connected with sunlight—so closely, indeed, that for some purposes vitamins and sunshine may be said to be interchangeable, as though vitamins were a kind of stored-up sunlight.

German investigators have found that cows grazing on the sunny side of the deep Alpine valleys produce milk richer in vitamins than those on the shady side. A still more interesting discovery was made by American scientists. They found that

by exposing foods lacking in vitamins to sunlight the mysterious quality could be produced, and that most foods so treated did not lose their vitamins even with keeping. The same result followed from exposing them to ultra-violet rays—the “artificial sunlight” produced electrically, which is so much used in hospitals and clinics for giving “sun” treatment to children. These experiments were tried on several different kinds of foods, including cereals, margarine, &c. They have been followed up by similar experiments in Germany and England, and this knowledge is now beginning to be applied. When the hospital authorities in the instance referred to found what was wrong with the milk supply they did not go elsewhere for milk, they had it “irradiated” by artificial light, and all the children recovered.

The Co-operative Movement and the New Knowledge.

Now all this new knowledge of food values is surely of great importance to the co-operative movement. The co-operative movement is not like other traders, merely a business concern, content to give its customers the least that will satisfy them. Its purpose is to bring to all as much as possible of all the things that make for health and happiness and well-being. It seeks to give its members the best that their collective efforts can obtain. Therefore, it has always attached the greatest importance to the quality and purity of what it produces or sells. Often it has led the way in improved methods or higher standards. Here is another opportunity of being a pioneer for the people's welfare by applying this new knowledge to co-operative productions, and so giving them the best food value.

Co-operative societies dealing in milk and milk products, for instance, have set a splendid example by introducing the very best and most up-to-date methods of cleaning and purifying the milk and rendering it germ-free by sterilising or pasteurising it. The new knowledge tells us that while these processes kill the germs of tuberculosis and other diseases that come from infected milk they may also destroy the life-giving vitamins, and that in any case vitamins are almost wholly absent from the winter's milk produced by artificially fed cows. But it tells us also that by treating milk, whether liquid or dried, with artificial sunlight its vitamin content can be restored. Ought not co-operative societies to consider whether and by what means this knowledge can be applied in their own dairies, so that the milk, butter, and cheese that they sell may have the highest nutritive value? And is not the fact that margarine can be made as nourishing as butter if the lacking vitamins are added to it by “irradiation” also one of which the co-operative movement of many countries might take account?

The new knowledge tells us again that fresh natural food contains valuable elements that are lost in tinning, preserving,

or over-refining it. How does this affect the co-operative movement? Our mills can produce wholemeal flour as well as white flour, and do so; our shops can sell their members fresh fruit and vegetables, though perhaps this is one of the lines of co-operative trade that could be much developed in some countries; they could probably supply their members with iodised salt as easily and cheaply as common salt. But the tinning and preserving of food—meat, fruit, and vegetables—forms one of the most important productive activities of the co-operative movement. Co-operators have undertaken this kind of food production because of the necessity for providing their members in a convenient form with food that would keep. The problem of how to combine the keeping of food with the retention of all its nourishing qualities is one of the great food problems of the modern industrial community. Do not the new discoveries about "irradiation" suggest a possibility here that co-operative producers might investigate?

Then, too, the co-operative movement often supplies the farmer with manures and fertilisers for his soil and fodder for his livestock. Should not investigations be made into the possibility of treating the artificial foods manufactured and supplied by the co-operative movement with light (as chicken foods and cow-cake have already been treated experimentally in America and elsewhere), so as to give them the vitamin value which they lack, and of including in the manures and fertilisers the necessary iodine, so that the plant life which feeds both animals and human beings may receive and pass on this vital food element?

What is Needed.

The technical processes by which all this new knowledge can be applied to food production on a commercial scale have not yet been properly worked out, and it may be necessary for co-operators to wait until the appropriate technique has been invented before they can utilise these discoveries. But is it necessary that co-operators should always wait for private traders to invent, and probably patent, new processes? There can be no doubt that "irradiation" will be applied to the production of food commercially, as similar discoveries about light are already being applied to the production of glass and clothing. In all such things the co-operative movement, which seeks to give its members the best that is possible, should surely consider how it can take a lead.

For every wholesale society engaged in food production to have an expert staff working out the technical application of such discoveries might involve too great an expense and unnecessary duplication. The result could be more economically attained

by working internationally. Some kind of International Co-operative Institute for technical research, whose business it would be to keep abreast of scientific knowledge of this kind and work out the methods of its application, could keep the movement of the whole world informed about those discoveries and inventions that would be of value to it, and how they could be utilised for the benefit of the members. Working in collaboration with the national wholesale societies, it could find out and try to meet their technical requirements not only in regard to food production, but in many other directions. For with the march of science there will be constantly fresh knowledge, which should be brought to the service of the people without paying tribute to the profiteer in the form of expensive patents.

Medical knowledge, too, on such matters as food values necessarily grows with the advance of science generally, and it would be a good thing if every wholesale society that goes in for food production would consider attaching to its service as adviser on these matters some first-rate medical man or woman. Such a medical adviser would need to be a specialist in nutrition, and recognised as such by his profession, and would collaborate with the analyst at the head of the society's analytical laboratory to ensure that the food produced was up-to-date as regards medical and scientific requirements.

It is not suggested that these things can be done at once or by every country. The many conflicting claims on its resources and the very different circumstances of the co-operative movement in different countries must be recognised. A report like this can only attempt to indicate the significance of the new knowledge to the movement as a whole, and suggest some of the possibilities which call for consideration, because they open up new prospects of co-operative progress and of human welfare.

Practical recommendations in regard to food values may therefore be summed up as follows:—

I. FOR HOUSEWIVES:—

(1) More study of the whole question of food values, so that women may know in detail the value of different kinds of food.

(2) A special study of the methods of cooking which conserve instead of destroying the vitamin content of food.

II. FOR THE CO-OPERATIVE MOVEMENT:—

Consideration and investigation of the possibilities of applying to co-operative food production the recent scientific discoveries as to vitamins, iodine, and "irradiation."

RESOLUTIONS.**I.**

This conference of the International Co-operative Women's Guild approves the report on food values and food purity, and commends it to the attention of the co-operative movement.

It further recommends that all affiliated national guilds should endeavour:—

- (1) To get their co-operative movements to organise an educational campaign on pure food and co-operative production among their members.
- (2) To ascertain fully the laws and regulations of their country in regard to food adulteration.
- (3) In co-operation with other organisations, to press for legislative and administrative reforms where necessary.
- (4) To arouse public opinion on the need for pure and nourishing food and the good quality of co-operative productions by organising, jointly with other bodies where possible, a national " Good Food " campaign.
- (5) To secure consideration by co-operators in their country for measures by which the latest scientific knowledge as to food values may be utilised by the co-operative movement.

II.

In view of the extensive international trade in foodstuffs, this conference of the International Co-operative Women's Guild is of opinion that for the safeguarding of health throughout the world measures should be taken by all Governments in common, by means of international conventions, to prevent the use of injurious or unhygienic methods in the preparation and handling of foods.

