

FOOD AND DIET

(WRITTEN FOR CHILDREN)

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The purposes of food. Everybody knows that living things cannot exist without food. Starvation means death. Let us first consider why food is needed by our bodies. In the first place, it is needed as a supply of *fuel*. A railway engine cannot go without coal, nor a car without petrol. Throughout life, some part or other of the body is constantly working or moving; the heart beats, driving blood to every part; the lungs take in air and with it oxygen, and expire gases generated by the body; other organs are busy digesting food and transforming it into flesh and blood, discharging waste material, preparing substances the body needs, and in many other activities; the muscles move the body and its various parts. For all these purposes the energy supplied by food is necessary. Food is "burnt" in the body to produce the heat and energy required for making the body live and move.

But food has other purposes to fulfil. Living creatures grow and the material necessary for growth must be obtained from food. Again, the body needs repair; its tissues "wear out" and have to be replaced, just as parts of an engine wear out and need to be replaced. Some loss of body substances, which must be made good, is always taking place. If the body is to grow properly, and maintain all its parts in the most efficient working order, it must be supplied with the right kind of food containing all the materials it needs.

What food must supply. Almost any kind of food can supply heat or energy. But some foods are much better than others for supplying the substances which the body needs to make it grow and to keep it in health. The substances which food must supply in the right amounts are the following:

Protein	Fat	Carbohydrate
Mineral salts	Vitamins	

Protein is necessary because it supplies *building material* for the body. Fat and carbohydrate supply heat and energy. The mineral salts and vitamins are needed to keep all the parts of the body in good working order. A motor car engine needs petrol which explodes in its cylinders and drives the pistons down. But it also needs oil to keep it working smoothly and well, and it will break down and stop just as quickly without oil as when the petrol tank is empty. The action of the vitamins and mineral salts in the body may be compared to the action of oil in a petrol engine.

Now-a-days we know how much protein, and how much of the various vitamins and mineral salts, are contained in the foods which make up our diets. This has been worked out by scientists in their laboratories. We therefore know the nutritive value to the body of these foods, and it is easy to tell the differences between a good and a bad diet when we know the different

foods it contains. Ordinary people do not need to know how many vitamins, and how much of each, are present in each food. All they need to know is how a good diet should be made up and which foods are richest in the substances we need most.

The value of various kinds of food.

Cereals. The cereals include rice, wheat, cambu, cholam, ragi, and a number of other grain foods less often eaten in India. The chief food of most people in South India is rice, and it is very important that Indian children should learn something about the food value of this grain. It is the main food of about seven hundred million people in various parts of the world, which amounts to nearly half the human race. Rice is a good fuel for the body; when we are hungry and need food, a big meal of rice makes us feel comfortable and satisfied. But rice cannot supply enough of *all* the substances the body needs, no matter how much we eat of it, so that we need to eat, as well as rice, sufficient quantities of other foods such as pulses, vegetables, fruit and milk. Otherwise our bodies will not grow properly and be fit and strong.

There are some other things to remember about rice. Paddy harvested from the fields has a woody husk which has to be removed before rice is eaten. The rice grain itself, after the husk is taken away, consists of three parts. First, there is the little *germ*, which you can see at the end of the grain; this is the part which grows into a new plant when rice is sown in the fields. Secondly, there is an outer layer covering the grain, which is sometimes called the *bran*. The bran layer is very easy to see in red rice, which is red outside and white inside; the red part is the bran. White rice has got the same sort of bran on it, but it is not so easy to see. Thirdly, there is the inside part of the grain, which is sometimes called the *endosperm*. Now the germ and the bran contain more vitamins than the inside part, and so it is a bad thing to remove the outer part of the grain before rice is eaten. Unfortunately this is just what rice mills do; they produce white rice which has lost its best parts. Rice which has been made very white by the mills is not as good a food as rice which has been pounded by hand, because hand-pounding, unlike machine milling, leaves quite a lot of the bran behind.

Another thing to remember about rice is that, if you do eat milled rice which has lost its germ and bran, it is better to eat parboiled than raw rice. In most parts of India people eat parboiled rice in preference to raw rice, and this is a good habit to follow. The steaming of paddy alters the grain in a strange way, so that some of the vitamins pass from the germ and bran into the inner parts of the grain. Once paddy has been parboiled, even the most up-to-date mills, which turn out highly-milled and polished rice, cannot remove all the vitamins from the grain, which is a good thing.

Before rice is eaten it is washed and then cooked. Now it is necessary to wash rice which contains dust not dirt, but

unfortunately washing removes a good deal of valuable food material, including vitamins, which passes into the washing water and leaves the grain poorer than before. It is the first washing which causes most of the loss, so that there is not much to be gained by reducing the number of washings. The cooking of rice may cause further losses of vitamins and other necessary food substances if too much water is used and the cooking water is thrown away. In cooking, the smallest necessary amount of water should be used, and the water or congee in which rice has been cooked should always be taken.

Whole wheat (atta), ragi (okra), cholam (jowar) and cambu (bajra) are in some ways better food than milled rice, although, like rice, they cannot by themselves supply all the substances we need for growth, repair and health. Ragi, cambu and cholam are *millet*s. It is a good thing for people who live chiefly on rice to take some wheat or millet every day.

Pulses. Let us now consider certain other kinds of food which enter into our diets. Most people in India eat some pulses such as dhal, gram, etc., every day. Other familiar pulses are peas, beans and lentils. The pulses are richer in body-building materials than the cereals and they also contain more of certain vitamins. Hence it is important that some pulses—amounting to one or two ounces every day—should be taken by growing children, and this is particularly necessary when the diet is largely made up of milled rice. In many parts of India people do not grow and eat enough pulses.

When pulses are allowed to sprout they develop one of the vitamins in the growing shoots. A method of sprouting pulses is to soak them in water for twenty-four hours and then spread them out on a damp blanket and cover them over with a moist cloth or sack which is kept moist by sprinkling water upon it from time to time. After two or three days the grains will have sprouted and be ready for use. They should then be eaten raw or after being cooked for only a few minutes. It is good to eat sprouted pulses when you cannot get enough fresh vegetables and fruits.

Vegetables. Vegetables do not supply much food energy; a meal which consists only of vegetables will not satisfy a hungry man. But they are of value for another reason—because they supply certain vitamins and mineral salts. You should remember that one kind is particularly good. This is the *green leafy* kind, which includes cabbage, amaranth, drumstick leaves, spinach and many other varieties. The leafy vegetables contain plenty of vitamins, and they are rich in one of the mineral elements which the body needs most—calcium. People who live largely on rice are often short of calcium, because rice contains very little of this element. For this and other reasons at least two ounces of green leafy vegetables should be eaten every day.

Not only leafy vegetables, but vegetables of all kinds, should be eaten in greater quantities in India, in order to enrich the

diet with vitamins and other necessary substances. In many parts of the country more vegetables could be grown in the villages, if people would take the trouble to do so. Every house should have a little vegetable garden, or else vegetables should be grown on some suitable piece of ground near a well or wherever water is available. It is surprising how many vegetables can be raised from a very small plot. Waste water from the house can be used to water vegetables. At least six or eight ounces of vegetables, including two ounces of leafy vegetables, should be taken daily. The growing of more vegetables in India would do much to improve the health of the people.

Fruits. What has been said about vegetables is also true of fruits. Fruits supply vitamins and mineral salts and they are useful in keeping the bowels healthy and active. The tomato is a fruit which is of high value and it is also one which is very easy to grow. Indian gooseberries (amla), which ripen in jungles and forests in the cold season, are very rich in one of the vitamins—vitamin C. Plantains and bananas are not very rich in vitamins, but they are nevertheless good food. It can indeed be said that any kind of fruit is good healthy food and supplies necessary vitamins and mineral salts. Two ounces or more of fruit should be taken daily. More fruit should be grown in India.

Nuts are rich in protein and fat and in some of the vitamins. They cannot be eaten in very large quantities, but taken in small quantities they make a good addition to rice diets. Some nuts, such as ground-nuts, are used as a source of oil.

Vegetable oils. These include gingelly, coconut, ground-nut, linseed and mustard oil. They are good fuel foods, but do not contain vitamins. Butter and ghee, on the other hand, do contain vitamins, and are therefore better food than vegetable oils, but, of course, they are dearer. Those who cannot afford butter and ghee should take about one ounce of vegetable oil every day.

Milk. We now come to the best of all foods—milk. Milk is rich in body-building material (protein), vitamins and mineral salts, and, in fact, supplies all the substances of which there is not enough in rice. There is true of all kinds of milk, including buffalo's, cow's, and goat's milk. Unfortunately milk is dear and scarce in many parts of India and poor children never get enough of it. Many Indian children, indeed, never get any milk at all to drink. If more milk were to be consumed in India, this would mean a great improvement in the health of the people. Boys and girls would grow stronger and bigger and there would be less sickness.

In India cows and buffaloes often produce very little milk because they are themselves not properly fed. To increase the milk supply, more food for cattle must be grown. It is unfortunate that in India there are many old and useless cattle which produce no milk and eat up grass and fodder which might be used to feed the better cows and buffaloes.

Milk from which the fat or cream has been removed—skimmed milk—is good for children, though not as good as whole

milk. Skimmed milk contains the body-building materials, mineral salts and most of the vitamins present in whole milk. Butter-milk and curds are also very good. Growing children should take at least eight ounces of milk every day. Few children in India get even half this quantity.

Milk fat (butter and ghee) is good food because it contains one of the most important vitamins—vitamin A. Ghee is butter that has been boiled. Butter is made into ghee in India because ghee keeps better in a hot climate. Ghee sold in the bazaar is often mixed with vegetable fats and this makes it less valuable as a food because vegetable fats do not contain vitamins.

Milk as sold in many parts of India often contains a lot of dirty water which is added by the milk sellers to increase their profits. Children now growing up in India must see to it that the milk supply of their country is improved. Indian needs more milk and purer milk.

Meat, fish and eggs. Very little meat is eaten in India, even by those whose religion does not forbid meat eating. Meat is good food, rich in body-building substances, but it is not a necessary food because a diet containing whole cereals, milk, pulses, vegetables and fruits in the right amount, and no meat, is in every way a satisfactory diet. Liver is an exceptionally valuable food, rich in protein, vitamins and mineral salts. Fish, whether fresh or dried, contains a good store of some of the substances in which rice is deficient. Small fish which are eaten whole are very rich in calcium. Of eggs it may be said that they are nearly as good as milk. More eggs should be produced and eaten in India.

Condiments and spices, such as chillies, tamarind, saffron, pepper, cinnamon, garlic, etc., are used in all Indian homes. They add flavour to rice and other foods and increase appetite. But they do not supply body-building materials, vitamins or mineral salts to any great extent. Condiments taken in excessive amounts may be bad for the stomach and intestines.

Some of the results of wrong feeding. The usual diet eaten by poor people in India is in many ways a bad diet. It usually contains too much rice, and too little milk, pulses, vegetables, etc. A child who does not get enough of the right sort of food to eat will not grow properly; it will be thin, small, weak and easily tired. The skin, instead of being smooth and glossy as it should be in a healthy person, will be dry and rough. Eye trouble and soreness of the lips and mouth are sometimes caused by wrong feeding. People living on a poor diet get all kinds of illnesses more easily than well-fed people, and when they get sick they take longer to get well. A good diet is particularly necessary in places where there is much malaria and hookworm. Both these diseases cause *anaemia*, which means lack of sufficient good rich blood. People without enough blood are weak and sickly. Iron enriches the blood, and *anaemia* caused by malaria or hookworm can be improved by taking iron pills or tablets. A

good diet contains more iron than a poor diet, so that proper feeding also helps to enrich the blood.

The right kind of food for Indian children. Sir Robert McCarrison, who worked for many years in India and is a great authority on diet, has written a little book called "Food", for use in schools in India. The following is a passage from "Food":

"The right kind of food for Indian children and, indeed, for children in any country, is one made up of the following simple things: (1) any whole cereal grain or mixture of cereal grains; (2) plenty of milk and the products of milk—curds, buttermilk, butter, ghee; (3) sprouted pulses; (4) eggs, or liver, or meat, or fish, occasionally, if religion permits their use; (5) tuber and root vegetables; (6) abundance of green leafy vegetables; and (7) fruit. These are the things with which the appetite should be satisfied; the things that should be eaten for health's sake. What else is eaten does not greatly matter so long as it is simple, clean, easily digestible, well prepared and not in excess of the body's needs."

THE INDIAN GOOSEBERRY (AMLA) AS A SOURCE OF VITAMIN C

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All fresh fruits and vegetables contain some vitamin C, which is now often called ascorbic acid; this is the vitamin which prevents and cures scurvy. The amount of the vitamin present in various fruits is very variable; for example, orange juice, which is usually accounted a rich source and which is often given to infants to supply their needs of the vitamin, contains about 40 milligrammes of vitamin C per 100 cubic centimetres (about 3½ oz.), whereas the common plantain contains only about one tenth of this amount. There is one very cheap and common fruit, namely the Indian gooseberry (*Phyllanthus emblica*, Linn.), which is very rich in vitamin C, —which, indeed, contains more of this vitamin than any foodstuff previously investigated. The fresh juice of the fruit contains nearly twenty times as much vitamin C as orange juice, and one single gooseberry is equivalent in anti-scorbutic value to one or two oranges.

The amount of vitamin C present in a foodstuff can be determined either by chemical methods or by animal experiments. Some years ago chemical investigations, carried out in the Bio-chemical Laboratories, Madras, and the Indian Institute of Science, Bangalore, suggested that the Indian gooseberry has a high vitamin C content. Chemical tests for vitamin C are not, however, invariably reliable, since the reaction may be given by other substances which are chemically akin to vitamin C but which cannot replace it in