FOOD, DIETETICS AND NUTRITION IN ANCIENT INDIA

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ABSTRACT

In pre-agricultural era, entire mankind consumed meat as early man was a hunter. Possibly he ate from plants sources which grew in the wilderness. With the advent of agriculture as an outcome of civilization, man acquired the ability to cultivate what he wanted, as by now he was influenced to some extent by the selection of the food that he wanted to eat. All this ultimately led to him taking to vegetarianism, which probably did not occur until approximately 1500 B.C. It is tried in this study to examine the concept of nutrition, balanced diet, appetite, food etiquette, food sanitation and food poisoning etc. in ancient India.

Food is vital for survival. Early man ate what was around him. In the pre-agricultural era, entire mankind consumed meat as early man was a hunter. Possibly he ate from plants sources which grew in the wilderness. As agriculture is an outcome of civilization, man acquired the ability to cultivate what he wanted. This decision to cultivate not only depended on the ease of cultivating but also on what he wanted to cultivate. By now he was influenced to some extent by the selection of the food that he wanted to eat. All of this ultimately led to man taking to vegetarianism which probably did not occur until approximately 1500 B.C. Widespread Vegetarianism probably did not occur until approximately the 4th century A.D. This was mainly due to the spread of Jainism and Buddhism in India.

This chapter examines the concept of nutrition and a balanced diet in ancient India. No data is available on the knowledge of food and nutri-

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tion in the earliest inhabitants of India - the Negritos or the Proto-Australoids. The Dravidians who lived later and were considered the people of Harappa and Mohanjodaro civilization (2800-2500 B.C.) recognized cereals, used household utensils and, thus, could be considered somewhat knowledgeable on food and, perhaps, on nutrition. Remarkably, they had a water supply and drainage system. By the time of Mahabharata (1500 B.C.) and Rigvedic period (1500-1000 B.C.) dairying was well developed, fermented (Soma) and alcoholic (Sura) drinks were also consumed suggesting that an advanced level of food preparations had developed. A sufficiently advanced knowledge of dietetics and the concept of nutrition was in existence by the time of Atreya (1000 B.C.) one of the earliest author of the Charaka Samita (School of Physicians). Details of nutritive values of foods, food interaction, nutritional deficiency diseases, and the concept of absorption and metabolism were described in Charaka Samita. Subsequent writers, such as Vagbhata (6th century A.D.) in his authoritative work “Ashtanga Sangraha,” makes reference to several food articles, deficiency diseases (such as anemia), and delirium tremors related to alcohol withdrawal. Dietetics as a recognized part of medicine in Ayurvedic literature is found in “Bhava Prakasha” written by Bhava Mishra (1550 A.D.).

The study of foods and nutrition in India poses certain problems. From the early periods there have been several foreign invasions. Each of the invading groups introduced flora with the resulting food items being absorbed into the main stream of foods. European sailors who started arriving in the 16th century introduced such items as cabbage, carrots, cauliflower, beets, Italian squash, etc. Some of these foods are clearly identified as being from the west with a prefix “Western” to the vernacular name. For example, Italian squash (Chayota) has been called “Western egg plant”, whereas the indigenous egg plant has been in use prior to arrival of European sailors.

In order to understand the concept of well balanced diet in ancient India, one needs to evaluate a suit-
able model. The criteria for such a model is that it should be a whole meal, it should have its origin at least prior to arrival of European sailors, should be balanced and the items that are used should be defined including substitutions that are to be permitted due to seasonal variations. Additionally, the recipe should have been passed on for several generations. After considerable thought, it was felt that the meal served at Shraaddha, which is the ceremonial meal served annually in the memory of the dead, met the criteria. This meal is wholesome in light of the modern knowledge of nutrition as it has all the nutritional requirements both in quantity and quality. Some of the items are prescribed by Manu (1st century A.D.).

In Rigvedic period (1500-1000 B.C.) meat was part of this ceremonial meal but, subsequently, due to impact of Jainism and Buddhism, this meal became wholly Vegetarian except for milk and milk products. The items that are permitted in this meal are included in table 1.

Items such as garlic and onion were not permitted. Asafoetida (which was imported from Prussia), saffron (which was, perhaps, imported from Europe) and all European Vegetables such as cabbage, beets, carrot, cauliflower were not permitted. Red (hot) pepper was also not permitted.

Various aspects of food and nutrition in ancient India including those mentioned in Ayurveda will be discussed under several separate headings.

Balanced Diet

What is a balanced diet? In the light of modern science, a balanced diet can be defined as “a diet that contains adequate amounts of carbohydrates, proteins, fats, vitamins, minerals (including trace elements), fiber and water.” Of the proteins and fats, at least a small percentage must come from an animal source in order to provide the essential fatty acids and essential amino acids which cannot be synthesized in the body or cannot be provided by Vegetables sources. The diet should be adequate both in quantity and quality.

The largest contribution for scientific understanding of food, di-
etetics and nutrition comes from the Charaka Samhita. The Charaka Samhita appears to be the work of more than one author. The earliest work was from Atreya who was connected with Takshashila University about 1000 B.C., followed by Charaka himself (200 B.C.) who simplified and enlarged the original text and later by Dridhabala (400 A.D.) who further expanded it. Charaka recognizes that food is a form of energy as it is composed of five elemental entities (bhutas) - earth, fire, water, wind and ether. These five elements exist in the form of substances (dhatus); rasa, blood, flesh, fat, bone - marrow, and semen. The function of food is to nourish these dhatus. Food is first converted into rasa and then in turn into blood, flesh, and other dhatus. This later concept is identical to what is understood in modern physiology about components of food getting converted into body constituents. Charaka has very clearly mentioned the concept of a balanced diet for which he has used the words ‘Sarvagraha’ and ‘Parigraha’. The former means total quantity of food which is a balanced or wholesome diet and the latter denotes quality of individual items which are essential from the point of nutrition meaning various subgroups such as Vitamins, essential amino acids, etc. Charaka also divided foods into various subdivisions. For example, the foods were divided into categories according to source - immobile (plant kingdom) and mobile (animal kingdom) and were two types classified according to effect wholesome and unwholesome. There were four types based on type of intake; drinks, edibles, chewables, and lickables; six types according to taste; and twenty types according to properties such as heavy-light, cold-hot, unctuous-rough, stable-mobile, soft-hard, etc. Foods have innumerable variations due to abundance of substances, their combinations and preparations. Further, food substances were divided according to the groups such as shukadhanya (awned grains), shamidhanya (legumes), mamsa (meat), shaka (vegetables), phala (fruit ), harata (salads), madya (alcoholic drinks), Jala (water), gorasa (milk and milk products), ikshu (sugar cane and its products) and aharayogi (condiments).
The items of diet which were mostly used were classified into materially wholesome or unwholesome based on, possibly an understanding of the nutritive values. The foods which maintain the balanced dhatus in normalcy and restore the equilibrium were taken as wholesome. All others were considered unwholesome. Foods which were considered naturally wholesome are as follows: among several types of rice - the red shali rice, among legumes - green gram, rock salt among salts, among several meats that of buffalo and game birds, rohita among fish, cow milk among milks, cow-ghee (butter fat) among ghees, sesamum oil among the vegetable oils, lard among the fats of marshy animals, grape among fruits, and sugar among products of sugar cane. The worst food items, considered to be naturally unwholesome, were also defined. These were as follows: barley (yavaka) among awned cereals, beef among the animals meats, blackgram among the legumes, rivers water during rainy season among the various types of water, and sheep-milk among milks.

Food was considered the best among life-sustaining factors, wine among the fatigue-alleviators, milk among the vitalizers, meat among body-builders, salt among those producing relish in food items, and sour among cordials.

Group of Meats (Mamsa)

Meats were grouped based on the habitat of animals from which the meats were derived and later the nutritive value and medicinal effect were described. Meats of cow, camel, panther, mule, python, frog, iguana, porcupine, lion, bear, tiger, goat, sheep, tortoise, crab, crocodile, whale, catfish, dolphin, bear, yak, buffalo, elephant, antelope, deer, swan, pig, various fish, parrot, pigeon, peacock, chicken were consumed. Meat of male animals was considered superior to that of female animals as females have a higher fat content. Undamaged meat of adult animals, fish, and birds living in suitable environment and killed with non-poisonous weapons was to be eaten. Meats of animals who died of natural causes, those were emanciated, obese, old, young, killed by poisons, not maintained on proper graze
or were bitten by snakes, tiger, etc. were to be discarded. Many medicinal effects of various meats were described. Eggs of swans, hens, peahens, and sparrows were eaten. Meats were eaten cooked. Meat soup was considered nourishing and cordial. Among various fishes, rohita (Cyprinus rohita) was considered the best, and among various meats those of game birds and buffalo were considered best. Less wholesome meats were beef and pork. It is now considered that consumption of beef and similar “red meats” are less desirable as their high fat content may be related to arteriosclerosis and possibly colon cancer.

Groups of Grains (Shukadhanya)

Cereals and legumes were recommended for use when they were about one year old. The legumes that were dehusked and properly fried or cooked were considered easy to digest. Frying and cooking breaks the cell wall, releasing the starch and other substances for easy exposure to digestive juices and enzymes, thus, making them easily digested and ready for absorption. Of the several rices known at that time, red shali was considered the best. This particular rice compared to other varieties seems to have a higher content of vitamins and other nutrients and is less likely to be spoiled in a tropical climate when left at room temperature. Wheat (godhuma) and barley (Yavaka) were known, but the later was considered unwholesome among cereals.

Groups of Legumes (Shamidhanaya)

Green gram (mudga) was considered best among the legumes used as pulses. Black gram (masa) was considered strength-promoting and other legumes such as horse-gram (kulattha), chick peas (chanaka), lentils (masura), peas (harenu) were consumed. Black-gram was considered unwholesome. Excess consumption of this was said to lead unto deafness. Whether black-gram contains an ototoxin is not established.

Vegetables (Shaka)

Vegetables were consumed raw (harita) or cooked. Onion (palandu), garlic (lashuna), and radish were in use. Several vegetables were dried
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and used in off-season. Various mushrooms were described. Since early days, it was a common practice to grow a kitchen garden (Grhavatika) which was looked after by women.

Vegetables which were affected by insects or wind, were old, unseasonal, or cooked without fat were discarded.

Fruits (Phala)

Grapes were most popular until about the time of Gau-thama Buddha (500 B.C.) who popularized mango. Fruits occupied an important place in religious fasts, in worship and in entertaining guests. It was to be noted that vitamin C is not stored in the body and, hence, if this is not taken during prolonged fasting, one might suffer from certain diseases. Perhaps this was recognized and may be the reason why fruits were permitted during fasting including those cultivated and ones grown in the wilderness. Fruit juices were extracted. Dwarfing of plants (Vallikama) was practiced. Apricot (urumana), pomegranate (dadima), tamarind, orange (nagaranga), lemon, coconut, and several other fruits were cultivated and consumed.

The fruits which were old, unripe, damaged by insects, snow or sun, or grown in unnatural places and seasons were considered unfit for consumption.

Fats and Oils

Oils and fats, both from animals source and vegetables source, were consumed. Fats were said to be of four types - ghee (butter fat), oil, muscle fat and marrow. The sesamum oil was considered the best among oils. Mustard oil and oil from various other vegetable seeds were in use. Castor oil and linseed oil were used for medicinal reasons. Various animal fats were in use. Of these, lard was considered the best.

Salts and Spices

Several salts were in use. Of these, rock salt (saindhava) was considered the best. Salts were considered to aid in digestion and relishing, but one was cautioned against consuming too much salt. Excessive use of salt was said to cause baldness, graying of hair, and wrinkles - all signs of premature aging.
Ginger and hot pepper were used both fresh and dried. Black pepper was in use. Other spices, such as cummin and cardamon were noted. Asafoetida (Hingu) was in use and was imported from Prussia.

Different Kinds of Water

Water was considered a component of food in Ayurveda a view held in the modern nutrition. The water from rivers, ponds and wells was used but it was felt that water collected in the autumn was the best. The river water polluted with soil, feces, insects, snakes or rats was considered unhealthy. The water of rivers originating from the Himalayas was beaten and agitated and, thus was considered wholesome and virtuous. Water originating from certain other mountains such as Vindhya in central India was considered to cause filaria, leprosy and diseases of heart and head. The quality of water from ponds, spring lakes and streams were classified from the point of suitability on the basis of where they are located - marshy, hilly or other regions. The rain water by nature was considered to have 6 qualities - that it is cold, pure, wholesome, palatable, clean, and light (without sediments). The water quality depends on the soil on which it has fallen or flows. When it falls or flows on white soil, it is astringent, on pale soil it is bitter and on black soil it is sweet, etc. The various seasons were known to affect both taste and quality of water.

Milk and Milk Products

It appears that by the time of Maha-bharata (1500 B.C.) there was well organised dairying including milk and milk products such as buttermilk, butter, butter fat (ghee), etc. Charaka Samita also lists various milk and milk products. Milk and milk products such as yogurt and ghee where considered part of a balanced diet. Milk from cow, she-buffalo, she-camel, mare, donkey, she-goat, sheep, she-elephant and woman were described. Of these, cow’s milk was considered the best and sheep’s milk the worst. Yogurt was advocated in anorexia and emancipation for its strength promoting properties. Buttermilk (takra) was advocated for hyperlipidemia (snehavyapad), rightfully so, as buttermilk is low in fat. Fresh butter
was considered constipating, appetizing and cordial. Whey (takrapinda-ka), the solid portion when milk is acidified, was known. It was felt that rice should be dressed with a little ghee in order to make it wholesome (annaushadhi).

The milk was considered good when it is easily mixed with water (spoiled milk does not), is cold, clean white as a shell, or does not produce bubbles (perhaps due to growth of organism). As cattle was raised for milk and agriculture, veterinary science was well-developed. Usually, physicians treated domestic animals but some limited their practice to veterinary medicine and a few even specialized in elephants and horses. Shalihotra (800 B.C.) can be called “father of veterinary medicine”.

Alcoholic Drinks (Madya)

The art of making alcoholic drinks was known at least from the time of Rigveda (1500-1000 B.C.) Fermented drinks from grapes, date, rice, and barley were made. They were called sura (wine) and soma (liquor). Different types of grapes for making wine were also in existence. For examples, wine such as harahuraka and kapisayana was prepared from mridwika or superior grapes. Sura was considered beneficial to those

necessary to make up “Satvagraha” or wholesome food can come from milk and dairy products, vegetarianism could not ever have been practiced on a large scale or would not have persisted to the present day. It is, perhaps, India that introduced large scale vegetarianism to human civilization. While one could argue that the shortening of canine teeth itself had an impact on man taking up vegetarianism in reality humans cannot survive without some part of their diet containing animal proteins and fat and this is fulfilled only by way of milk and milk products. This does not involve, of course, killing the animal.
that were emaciated, those with deficiency in lactation, and those with anemia. Alcoholic drinks were considered helpful in digestion and for anorexia. Sushruta (600 B.C.) recognized the appetizing effects of alcoholic drinks. Various types of liquors such as sura, madira, jajala, arishta, shankra, pakvrasa, etc. were described. Fresh wine was considered heavy but the old wine appetizing, light, and relishing. Wine was also considered nourishing and able to remove fear, grief, and fatigue. It provided boldness, energy, imagination, satisfaction, corpulence, and strength. Wine was considered part of a meal. Improper drinking was considered to destroy intelligence and to restrain memory. There were warnings against excessive consumption of spirituous drinks. Alcoholic drinks were also used by Sushruta during performance of surgery possibly as an anesthetic. Stages of intoxication with spirituous drinks were described. Signs of delirium tremors were also known.

Vinegar was used in dietary preparations. Wine was advocated in winter and spring; but small amounts in fall and in summer. In summer, if at all taken, it should be mixed with plenty of water.

Alcoholic drinks were in use for several centuries, perhaps with no restrictions. Manu (100 A.D.) who laid rules for the society indicated that of the four major castes, three were not to drink. They were the Brahmin, who are involved in the teaching and advancement of knowledge, the Vaishya, who were involved in trade and commerce, and the kshatriya, who were warriors and administered the nation. The reason for laying such a rule is to prevent improper judgment under the influence of intoxication. There were punishments for improper drinking and drinking by a brahmin was considered a moral sin.

After Dinner Drink

The after-dinner drinks were both alcoholic and non-alcoholic including water. The types of after-dinner drinks suitable for a person was based on the biologic constitution of the individual as classified in Ayurveda (Vata, Pitta and Kapha). For those who are easily susceptible to respi-
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ratory ailments and those that are emaciated, meat soup was considered the best after-dinner drink. For those exhausted by (religious fasting, travelling on foot, etc.), milk was considered the best after-dinner drink. For the obese who were on a reducing diet, honey and water was considered the best. Wine was recommended for lean persons, those with mild appetite, and those experiencing poor sleep, anxiety, fear exhaustion due to physical work.

The role of the after-dinner drink is to moisten and break down the food mass, add bulk to it, help in digestion, easy transportation and quick absorption of food.

Diet in Pregnancy and Infancy

Charaka Samitha advises suitable diets for expectant women and “strength-giving food and drink” after the birth of the baby. If the fetus is benumbad and does not quicken, the woman should be advised to take soft and cool cooked rice of red shali, along with meat soup of falcon, fish, gayal cow, peacock, chicken and partridge added with ghee or soup of black gram or radish with plenty of ghee. According to Sushruta, the newborn is given a mixture of butter and honey for the first three or four days as the woman produces colostrum and not milk. Subsequently, the child is breast fed. It was advised to wash the breast before the child is fed. Some milk is to be let out before feeding the child. Emotional disturbances such as anger, fear, grief etc. were known to affect milk production. Weaning was advised at the end of six months with cooked rice. It was considered that mother’s milk is the best food for promoting growth and nourishment but in cases where it is not available, the services of a “wet nurse” were sought.

The wet nurse should come from the same caste and social status, should be healthy, of good behaviour, clean, loving, should have a living child and, of course, should have plenty of milk. In addition, she should be of youthful age; beautiful; submissive; and free from impatience, deformities and addictions. She should be born in the same place, not mean-minded and not indulge in mean acts. She should also be free from diseases. Normal and abnormal qualities of breast milk were also
recognized. In case a wet nurse was not available, then milk from cow was accepted as the next substitute. In order to increase the production of milk, the woman was advised to eat barley, wheat, rice, flesh of swampy animals, garlic, fish vegetables, and spirituous drinks with the exception of rum. Excretion of drugs in the milk was known and, often, the child was medicated through giving the drugs to the mother! Now, it is well established that certain drugs are excreted in the milk.

The Concept Of Appetite And Food Etiquette

Charaka recommended that meals be consumed twice a day; the first between morning and noon and the second in the late evening. The pattern of meal serving varies widely in India. One of the recognized ways is that the members of the family, or if it is a community dinner, all members would sit with an empty plate (metal or disposable made of banana or lotus leaf and the like) after washing their hands and feet. The food would be served starting with salt, salads, vegetables and other side dishes. Rice would be the last one to arrive and no food was to be eaten until a spoonful of ghee was poured on the rice. While this would take several minutes of waiting, it had the most effect on the appetite. What else could be more stimulating to the appetite than sight and aroma of the food?

Charaka Samhita advises that one should eat in a favourable place and with favourable accessories to avoid psychological disturbances. One should not eat too fast or too slow. When eating too fast, choking may result or defects in food may not be detected. On the other hand, eating too slow may result in not getting enough satisfaction, eating too much and food not getting digested properly. One should not eat while talking or laughing. One should pay attention to food while eating as when the mind is elsewhere the results may be the same as eating too fast. When all possible, food should be consumed warm as it will taste better and will digest properly. One should eat a proper quantity. This is important for production of proper digestive juices and propulsion of
food through digestive channels resulting in digestion without discomfort. One should eat after the previous meal is digested so that digestion takes place properly, appetite is arisen and the proper time interval is allowed for passing of urine, flatus, and feces. May be on this basis, Charaka recommended two meals a day. Finally, one should eat after due consideration as to what makes one comfortable. Manu (1st century AD) discouraged eating between the two meals a day and considered overeating prejudicial to one's health.

**Food Sanitation And Food Poisoning**

In ancient India, the concept of food sanitation was understood along with food being a vehicle for causation of certain diseases. The orthodox brahmins would eat food only after taking a shower and eat only freshly cooked food as in tropical climates food becomes stale in a few hours. Vegetables and foods are always washed before consumption and milk was never consumed raw to avoid the transmission of diseases such as typhoid, cholera, abdominal tuberculosis, and others. Often, the orthodox brahmins would cook not only for themselves but also for others as they were considered to know and follow all the precautions necessary for food preparation. Thus, such diseases as typhoid, cholera and other water or milk borne disease were uncommon in those who followed rigid food hygiene. In ancient India, metallurgy and pottery was well advanced and utensils made of metals and clay were available from even before the time of Indus Valley civilization (2800 to 2500 B.C.). Yet orthodox brahmins would use disposable plates made from leaves of lotus, banana, etc. were used to prevent the spread of food borne diseases! Leaves were often dried and stored for off-season use. For drinking, cups made of pottery or leaves were used once and disposed of.

According to Sushruta, the court physicians had to protect the king from poisoning and to inspect the royal cooking. During war, he, in addition, should purify wells and inspect food and drinks to protect against being poisoned by the enemy.
It was not uncommon in India to first feed some of the meal that was prepared to birds such as crow and watch them and then, after prayers, consume the meal. This practice was such a daily routine that, most often, many crows would come and wait at meal time. This was a way of testing for food poisoning, i.e., if the birds died after eating the food, then it was possibly poisoned. The poisoning would occur not only from the enemies but also known food poisoning. Toxicology as a science was fairly advanced in ancient India. Charaka Samhita mentions food poisoning and some of its treatments.

Food-Drug Interactions And Food Incompatibilities

Sage Atraya identified certain substances which are contrary to deha-dhatus and behaved with verodha (antagonism). This antagonism may be in terms of properties, combination, processing, place, time, dose, etc. Among them, certain food/food combinations and food/drug combinations have antagonistic effect. Thus, he recommends not combining fish with milk. As, due to conflicting viryas, this may be considered harmful. Both are high in proteins and vitamin A. Similarly, when many of the drugs are prescribed they are to be taken in the absence of certain food items. Many of the food items were themselves described to have medicinal effect. This drug-food interaction is recognized in the cosmopolitan medicine only very recently. One good example is avoiding protein rich foods along with levodopa in the treatment of Parkinson’s disease. It is now known that, due to competitive inhibition, the absorption of levodopa is impaired due to release of certain amino acids in high levels from the proteins in the food.

Digestion Absorption And Metabolic Effects Of Foods

Atraya (600 B.C.) suggested that food should be taken in proper quantity. This quantity of food should depend on power of digestion. Further, whatever quantity of food taken that gets digested in time without disturbing the normalcy should be regarded as a measure of proper
quantity. This quantity varies from person to person based on individual capacity of digestion. Foods were also divided into heavy, meaning those that are difficult to digest, and light, meaning those that are easily digested. It was also suggested that the heavy foods when well cooked would become more easily digestible. The term “agnibala” was used to define power of digestion. Eating during indigestion and during the period when the previous meal is not digested was discouraged. Irregular meals and food consisting of antagonistic items were among those causing irregularity of digestion. Additionally, foods with the same or identical nutritive values were discouraged. For example, it was suggested that fish and dairy products should not be consumed together. It was also recognized that antagonism becomes inert due to suitability, small quantity, strong digestive power, in young age, and persons havingunction, physical excercise and strength. Food and drinks with suitable smell, taste and touch and which have been taken according to the prescribed method are said to produce energy, constitution of dhatus, strength, healthy complexion, and clarity of sense organs. Meat soup was considered nourishing and cordial. This was regarded as nectar for those suffering from phethesis during convalescence and for the emaciated. Certain metabolic effects of foods were also recognized. Such foods as egg plant, jaggery, cheese, etc., are considered to have the effect of “Ushna” (meaning that excess consumption might cause such symptoms as burning sensation during defecation, urination with urine turning dark yellow, general feeling of warmth all over the body, and burning of eyes, nose and other mucus membranes. etc.) The recent work done at National Institute of Nutrition, Hydrabad, India, demonstrated that these foods when consumed in human volunteers to an excess quantity shows higher levels of sulphur containing amino acids compared to the period when these volunteers did not consume the above foods. Thus, the symptoms of Ushna could be related to an excess amount of sulphur containing amino acids.

Of the several components of food, each has a different function. For
example, water moistens, alkali helps digestion, meat soup nourishes, grape wine stimulates appetite, meat promotes body building and items such as black-gram which is consumed along with the skin produces abundance of internal excrement (feces). The consumer of food should make room for food in the belly as three portions - one portion for solid food items, one for liquids, and one for digestive juices.

The food consumed in various forms participates in the non-stop process of conversion to dhatus (metabolism). During this process, rasa (clear essence of food) and the excretion (waste products) are produced. From 'essence of food' (ahara-rasa) blood (rakta) muscle (mamsa), fat (medas), bone (asthi), marrow (majja), semen (shukra), the basic materials of five sense organs (ojas) and the parts like ligaments, lubricating substance in joints, etc., are formed. The excretions include urine, feces, sweat, and digestive juices. All three dhatus (vata, pitta and kapha), supporting materials and the excretion maintain their normal measure according to age and body receiving proper nutrients. Thus, the body is a product of food. Similarly, diseases can also be produced by improper food. Thus, wholesome and unwholesome food produces good and ill effects, respectively.

Psychological factors on digestion were known at the time of Charaka. It was considered that even wholesome food consumed in proper quantity does not get digested due to anxiety, grief, fear, anger, and poor sleep.

Disorders Related To Nutrition

Atraya indicated that the consumption of wholesome food promotes growth and the consumption of unwholesome food is the cause of disorders. He further stressed the importance of a balanced diet adding that wholesome food alone was not capable of averting certain diseases as the abnormality in time factor, intellectual error, taste, smell, etc., had an influence on onset of diseases. Further, in those taking unwholesome foods the ill effects may not be seen immediately and, further, the degrees to which the various unwholesome foods influ-
enced the derangement of dhatus varied. Beyond this, there was also a factor of variation in susceptibility to various diseases among individuals due to differences in immune response. Individuals who are too obese, too lean, have incompact muscles and bones, are under-nourished and have a weak mind are less resistant to diseases. Because of variations in faulty diet, innate pathologic factors and the condition of the body, the diseases become mild or severe, acute or chronic. Loss of desire for food, distaste in mouth, nausea, feeling of heaviness, drowsiness, body ache, fever, obstruction in channels (such as constipation), malaise, loss of digestive power, could influence dietary intake. For proper health, timely eating, satisfaction among the quantities of food and adequate physical exercise are important. Excess intake of food was considered to cause obesity and digestive disorders. Improper drinking of alcohol was considered to destroy intelligence and memory (dementia).

The quantum of food was divided into two categories - appropriate and inappropriate. The appropriate quantity of food has been described earlier. Inappropriate quantity is of two types - deficient and excessive. The food deficient in quantity is considered to cause loss of strength, unhealthy complexion and underdevelopment; to reduce longevity, virility and immunity; to cause damage to body, mind, intellect and sense organs. Further, being over-lean could be caused by fasting, sparse diet, excessive subjection to evacuative therapy such as enema, grief and suppression of natural urges including sleep. The over-lean person does not tolerate physical exercise, hunger, thirst, certain drugs, cold, heat and is susceptible to diseases. They have dried up buttocks, abdomen and neck; a prominent vascular network; only a remnant of skin and bone; and thick (lymph) nodes.

The overobese persons have eight defects: a shortened life span, hampared movement, difficulty in sexual intercourse, debility, excess sweating, foul smell, too much hunger and excessive thirst. Over-obesity is caused by excessive intake of heavy, sweet and fatty diet. Genetic
defects as a cause of obesity was also recognized. There is excess accumulation of fat in the obese and not the other dhatus. As a result, the life-span is shortened. Due to excessive increase of fat these people suffer from defective metabolism and lack of energy and have pendulous buttocks and breasts.

**Dieting**

There were prescribed methods of dieting for the healthy and the sick. Upayogasamstha denotes the rules for dieting. One should try to understand them and thereafter desire for the wholesome foods only. Food or any other edible items which are liked but are unwholesome and with unpleasant consequences should not be used by ignorance or carelessness. There are eight specific factors of method of diet such as - nature, processing, combination, quantity, place, time, rules for use, and, finally, the consumer. Nature (swabhava) is the natural composition of food items and probably refers to whether the given dietary item is rich in protein, carbohydrate, fat etc. Processing (karana) refers to food processing including cooking, frying, etc. Combination (samyoga) is aggregation of two or more substances or food items. Quantity (rashi) has already been discussed. Place (desha) denotes distribution of substances. Time (kala) is eternally moving and also refers to seasonal suitability. Upayokta refers to consumer of food. Saatmya means that which suits the self. It is of three types - superior, medium, and inferior - and of seven groups according to six rasas individually or collectively. Among them, use of all the rasas collectively is superior, that of one rasa inferior and in between these two are medium.

Having regular physical exercise, taking food only after the previous meal is digested, eating barley and wheat may result in relief from obesity. Fasting was also advocated to treat obesity by Charaka. Fasting was advocated on specific religious days, both among Hindus and Jains. One day out of a fortnight was set for fasting (Eakadashi), at which time one avoids regular meals and might consume a very limited quantity of simple foods such as milk and fruits or even practice total abstinence. This concept to avoid eating when
food is available is not only for control of obesity but also for control of mind, that is learning one's ability to control one's will power. The syndrome of excess sleep and eating (bulimia) was recognized as this syndrome is identical to the character Kumbakarna in Ramayana, one of the Indian epics.

One affected with acute wasting regains normalcy by administration of immediate-acting saturating measures but for chronic wasting, prolonged administration is needed. Further, in chronic debility the physician should administer the treatment unhurridly keeping in view the body, power of digestion, and other factors. For such persons, meat soup, plenty of milk, ghee, baths, enema, oil massage and saturating drinks are beneficial. In addition, plenty of sleep, a comfortable bed, a relaxed mind, calmness, and avoidance of mental work, sexual intercourse, and physical exercise was recommended. New cereals, fresh wine, well cooked meat, yogurt, rice, black-gram, wheat, products of brown sugar (jaggery) were advocated.

Charaka also makes a reference to taking an improper diet leading unto illness and special diets were prescribed. Sushruta had described anemia as a condition where the skin, eyes, veins, etc., are pale, there is fatigue and a sensation of heaviness, cough, and difficulty in breathing. Iron was used therapeutically perhaps to treat this condition. Weak digestion was said to be a cause of swelling of the body (edema) which possibly meant hypoalbuminemia resulting in edema. Goiter, an enlargement of the thyroid gland caused by a deficiency of iodine, is mentioned in “Javananta” (the bliss of the soul) a play based on the principles and terminology of Ayurvedic medicine written by Anandavayanaakhi who was a poet, play writer and physician. He lived in the first half of the seventeenth century at Tanjore in Tamilnadu, India.
Table 1: Some of the Items included in Shraaddha

Rice, Green gramdal, Black gramdal
Butter, Ghee (butter fat), Yogurt, Buttermilk
Cucumber (Papada), Bitter gourds (Karala), Plantain, Stem of Plantain tree, Okra
Mango (raw and ripened), Banana, Jack fruit
Ginger, Black pepper, Salt, Coriander, Cummin, Cardamon, Jaggery (brown sugar).

REFERENCES

प्राचीन भारत में आहार, अनुपथ्य तथा पोषण

—बाल वि. मन्यम

पूर्व मानव एक शिकारी था अतः कृषि पूर्व युग में समस्त मनुष्य — जाति मांसाहारी थी और इसके अतिरिक्त वह पूर्व मानव संभवतः आरण्यक वानस्पतिक खोज से भी अपना भोजन प्राप्त करता था। सभ्यता के विकास के परिणाम स्वरूप कृषि की शुरुआत के साथ मानव ने अपनी इच्छानुसार खेती करने की योग्यता प्राप्त करती और तब कुछ हद तक वह अपनी इच्छानुसार खाने के लिये भोजन के चुनावसे प्रभावित हुआ। अंततः इन सभी कारणों ने उसे शाकाहारी बनने की ओर प्रेरित किया और प्रायः 1500 ईसा पूर्व तक ऐसा नहीं हुआ होगा। इस अध्ययन में प्राचीन भारत के संदर्भ में पोषण, संतुलित आहार, भोजन शिफ्टचार तथा भोजन स्वच्छता इत्यादि की धारणा को देखने का प्रयास किया गया है।