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The Vegetarian Alternative

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Despite the increasing prices, beef consumption in the United States has continued to rise. In 1940 the average beef intake per person was 55 pounds, in 1960 the average was 190 pounds, and in 1970 it was 236 pounds.[1] For the next quarter of a century, moreover, the meat industry expects this figure to increase. Their prediction is based on the assumption that as a person's material well-being increases, his or her "predilection to increase the intake of animal protein" increases.[2]

And the meat industry may be correct. The meat industry has successfully fostered the notion that only "good red meat" can supply the essential minerals and vitamins to our bodies, and so a meat-centered diet became a sign of prosperity.

It is not true, however, that *only* red meat can supply the nutritional requirements of the body. In fact, with the exception of vitamin B_{12}, which can be obtained from all dairy products,[3] non-meat sources provide a very substantial amount of the necessary vitamins and minerals. Most of our calcium is supplied by non-meat foods: good sources are plant foods such as collards, turnip greens, and lettuce. Although meat is an adequate source for potassium, the baked potato and lima bean are better. Iron can be obtained in nearly equal amounts from animal products such as eggs, milk, and cheese; various seeds and nuts contain abundant iron. For magnesium, meat is a poorer source than cocoa, nuts, soybeans, whole grains, and leafy green vegetables.[4] According to Professor Fredrick Stare, head of the Department of Nutrition at Harvard University, even vitamin A, which is a naturally-occurring substance in various animal products, could be obtained without eating meat. He asserted that "about 60% of our vitamin A intake comes from carotene, which is a pigment, out of which we make vitamin A in our bodies."[5]

To most people food is a matter of habit and taste, and is not eaten strictly for its nutritional quality. Meat is eaten partly because it tastes good; and it is the fat that gives meat its taste. Along with fat, meat supplies a large amount of cholesterol to the body. Dr. Gerald Combs, director of the Nutrition Program at NIH, indicates that both of these substances may be dangerous. He says that, "From the work that's been done so far--highly suggestive but not yet proven--there is certainly a correlation between the level of saturated fat and cholesterol in blood and heart disease."[6]

Professor Stare concurs, adding that, "Most Americans would probably be in better health if they consumed less meat. Americans probably average between 10-12 oz. of meat per day. If that meat intake was cut in half, most Americans would probably be in better health, primarily

because of less saturated fat."[5]

To a vegetarian, food is more than simply habit or taste: it is a way of life. The aims of the vegetarian's lifestyle are threefold; to eliminate meat from the diet but still obtain the nutritional requirements of the body, the alleviation of the world food crisis, and the contribution to the furtherance of 'bioethics'--regarding the conservation of wild life, agriculture, and natural resources.

Vegetarian diets can be of various sorts, some wholly nutritious, others requiring specific vitamin supplement. The two main classes of vegetarian diets may be based only on plant food sources (total vegetarians, or *vegans*) or plant foods plus dairy products and eggs (*lacto-ovo*-vegetarians). Other classes of vegetarians include the lacto-vegetarian, who consumes plant foods plus milk, the fruitarian, the herbivore, and the granivore (seeds and grains).

With the elimination of meat from the diet, other sources of protein must be utilized. Only protein supplies nitrogen, sulfur, and phosphorus to the body, substances needed to build tissue fiber, and to build tissues such as hair and nails which are continually growing. Protein builds cartilage, tendons, muscles, and bone, and is the primary ingredient for basic chemical reactions in the body.

The proteins our bodies use are made of 22 amino acids. However, of these 22 only 8 cannot be synthesized directly by our bodies, so they must be obtained from outside sources. These 8 essential amino acids are leucine, tryptophan, lysine, isoleucine, valine, threnonine, methionine, and phenylalanine.

The difficulty arises in obtaining these 8 essentials. Our bodies need each of these 8 *simultaneously*, and in the right proportion. That is, if a person were to eat protein containing enough lysine to satisfy 100% of the body's requirement, and another 100% of the valine level, but only 50% of the tryptophan needed, then the body only utilizes 50% of the total protein ingested. These 8 acids, when properly combined, form a single utilizable protein unit.

Protein foods of animal origin (eggs, milk, and cheese) contain these 8 amino acids in abundant amounts. Thus, they are called "high-quality proteins." Cereal grains, however, are relatively low in lysine, though high in methionine. Thus, they provide "lower-quality proteins." In a single meal, though, if cereal grains were combined with legumes such as dried beans and peas, which contain lysine, then the 'balance' would be improved and sufficient amounts of methionine *and* lysine would be supplied.[7]

In comparing meat to plant protein, two criteria need to be considered--the *quantity* and *quality* of protein in the food. For instance, soybean flour is over 40% protein. Certain cheeses, such as Parmesan, are 36% protein. Meat is 20-30% protein. Generally, plants rank highest in *quantity* of protein.[3]

However, when the *quality* (or usability or digestibility) of those same protein foods are considered, a different story emerges. Meats, in terms of protein quality, range from 65-70%, whereas plant foods rank below meat. (Exceptions may be soybeans and whole rice, which approach or top the meat quality value.) On the average, plant foods rank around 50% "net protein utilization."[3] Therefore, in order to obtain an equal amount of the essential proteins (amino acids) from plant foods, as one would obtain from meats, a vegetarian should follow

one of several alternatives: to receive an adequate amount of the 8 essential amino acids, one should eat large amounts of lower-quality protein; eat alternate animal-protein sources, such as dairy products; or eat a wide variety of plant proteins which have mutually complementary amino acid patterns.[3] The best solution would be to combine a variety of plant foods with dairy products in the same meal.

The most important nutritional safeguard for any vegetarian is variety in the diet. The greatest risk for a vegetarian comes from undue reliance on any one plant food source. Restricting the variety of foods only restricts the variety and amount of nutrients digested. If, as has been outlined, certain essential amino acids are left out of the diet, then the body's protein requirements are not met.

This has been the case with one of the more recent diet-fads, the macrobiotic diet. This diet progresses in seven stages, the elementary stages being fully nutritious. With each stage, however, certain foods are eliminated until only brown rice and tea remain. Predictably, there have been reported cases of *kwashiorkor*--a severe protein malnutrition disease native to North Africa--occurring among macrobiotic dieters and their children. In a study of the physical measurements of vegetarian infants, macrobiotic children were found to be significantly smaller in size than children of other dietary groups. Measurements included recumbent length, width, head circumference, triceps, and subscapular skinfolds.[8]

Another dangerous diet could be a single grain diet. Dr. Combs asserts that, "These are potentially very harmful. A cereal grain is seriously lacking in several things, such as vitamin C and some of the B vitamins."[6] Vitamin supplement to a single grain diet would be a necessity. Otherwise, scurvy or beriberi may occur.

For those reasons, the vegetarian is in a precarious position because he or she must know which foods contain sufficient amounts and "quality" of protein and vitamins. The vegetarian's foods must complement each other in terms of amino acids. An excellent guide, with recipes, is Frances Moore Lappe's *Diet for a Small Planet.*[3]

Like the lacto-vegetarian and the lacto-ovo-vegetarian, the vegan, or strict vegetarian, can obtain an adequate supply of protein. The vegan, however, faces a very real danger in another regard. Unlike the lacto- and lacto-ovo-vegetarian, the vegan does not eat eggs, milk, or cheese. Therefore, a vegan can not obtain vitamin B_{12}, which is found primarily in animal products, especially in kidney, liver, and various seafoods. It cannot be found in nuts or grains.[5] Consequently, a vegan must take vitamin B_{12} for vitamin supplement, or drink *fortified* soy milk.[9]

A vitamin B_{12} deficiency can damage the nervous system and cause spinal cord degeneration. This condition has been referred to as "vegan back."[10] A vitamin B_{12} deficiency can also lead to the development of pernicious anemia because B_{12} is necessary for normal blood formation.[11]

The vitamin B_{12} deficiency is especially dangerous in that it is impossible to detect until the damage has been done--and the damage is irreversible. A vitamin B_{12} deficiency may go undetected because it can be masked in the diet by the intake of folic acid. Combs comments on this problem: "Vitamin B_{12} and folic acid are both effective in curing the initial stages of the anemia problem in humans. If you have a

B_{12} deficiency and consume higher levels of folic acid you can have an apparently normal hemoglobin level, and mask the deficiency. And of course a person who eats a vegetarian diet consumes leafy green vegetables and obtains folic acid. So you can commonly have advanced B_{12} deficiencies that are masked by folic acid that result in secondary neurological lesions that you don't spot until they occur, and they are irreversible. This can be a lack of feeling in the fingers or toes. You could stick pins in a person's back and he wouldn't feel it. This is what you get in a long-term B_{12} deficiency as a first symptom. This condition is known as vegan back in the vegan diet because it's so common. You get a lot of folin but no B_{12}."[6]

Generally speaking, a vitamin B_{12} deficiency is the single danger of the vegan diet, but it need not be a problem if the proper nutritional know-how is applied. There are also special nutritional problems for a vegan child and a pregnant woman, but these can be easily resolved.

In the winter, when the child's access to sunshine is restricted, it may be necessary for the child to take a vitamin supplement to obtain an adequate amount of vitamin D.[10] The nutritional problem for the pregnant woman concerns the acquisition of enough protein. On a theoretical basis, the pregnant woman can obtain the required level if the best plant sources are utilized: peanuts, soybeans, and nuts.[6] Nevertheless, many vegans have had to resort to consuming milk and eggs to restore health, and it is likely that a vegan woman who is pregnant would need to do the same. For a lacto-ovo-vegetarian woman who is pregnant little dietary advice is needed. She will probably have an adequate supply of nutrients.[12]

Since vegetarians consume less saturated fat and cholesterol they may have a lessened chance of developing heart disease. Persons with heart problems should certainly cut their meat intake. And the *risk* of heart attacks can be reduced by sharply decreasing the consumption of foods high in saturated fats and cholesterol. These include meats, whole milk, cream, ice cream, butter, lard, heavily hydrogenated shortenings, and margarines.[13]

Vegetarians often have lower blood pressure simply because they weigh less. "The decrease in blood pressure is probably correlated more with being 10 or 15 pounds lower in weight than anything else."[5] In a Harvard study, the blood pressure and individual dietary habits of 210 men and women were observed. They lived in communal households subsisting mainly on vegetable sources. The mean blood pressure for this group (ages 16-29) was less than that usually found in Western populations. The report suggests "a relation between blood pressure levels and consumption of food from animal sources."[14]

Dr. Combs pursues this relation between food from animal sources and higher blood pressure. He comments that the correlation between a vegetarian diet and lower blood pressure "might be true on the basis of something like sodium content, because sodium content in plant material is considerably lower (than in non-plant foods). And of course sodium is one of the key nutrients that influences blood pressure. A lot of the processed foods have sodium added, salts added, so a higher plant diet would probably have reduced salt intake and probably would tend to favor normal blood pressure."[6]

Despite these benefits of the vegetarian regimen, vegetarianism continues to be

viewed in the U.S. more as a fad than as a legitimate dietary alternative. Perhaps this is due to the somewhat extreme claims made in vegetarianism's behalf. One source contends that, "Intemperance which is the chief cause of pauperism and crime may be greatly discouraged by cultivation of vegetarianism."[15] Gandhi, the great Indian leader who experimented with his diet in order to observe personality development, asserted that the simplest foods (especially fresh fruits and nuts) were most beneficial for "calming of spirit and allaying animal passion."[16]

Adolf Hitler, a vegetarian, claimed that vegetarianism increased his working and intellectual capacities.[1] He constantly advocated the claims of the German composer, Richard Wagner, that a vegetarian diet had been the primeval diet of the human race. Hitler customarily entertained his associates--such as Bormann, Goring, and Himmler--at meals of vegetarian fare. After the meal, Hitler's associates often retreated to the kitchen and asked the cook for a second meal of their own choosing. This one case, however, says little about any notion that meat-eating and aggressiveness may be associated.

Perhaps these claims for vegetarianism are extreme, but they are not unusual. Strange notions about the peculiar properties of various foods have always existed. It was once popularly thought that seawater was helpful in cleaning out the digestive system. The same was later considered true of garlic. Sometimes these notions may be correct, such as the 16th century idea that by some mysterious process lemons and limes, consumed on long sea voyages, protected men from scurvy.[17]

One notion that persists until this day is the idea that fish is brain food. In the 19th century, Professor Louis Agassiz of Harvard University urged people to eat fish.[18] Fish is abundant in phosphorus, he argued, and phosphorus has been connected with thinking because certain compounds containing phosphorus are abundant in the brain. Mark Twain satirized Agassiz's assertion when he replied to an aspiring "Young Author's" letters which sought confirmation on this point.[19] Wrote Twain: "Yes, Agassiz *does* recommend authors to eat fish, because the phosphorus in it makes brains. So far you are correct. But I cannot help you to a decision about the amount you need to eat--at least, with certainty. If the specimen [writing] composition you send is about your fair, usual average, I should judge that perhaps a couple of whales would be all you would want for the present."

Fish, like the meat of land animals, consists chiefly of proteins and fat. However, the protein content of fish is generally higher than that of meat, but has a lower caloric content because of less fat and a higher water content. Fish oils are rich in vitamin D, and fish liver in vitamin A.[21]

A recent report released by the Senate Select Committee on Nutrition and Human Needs recommends significant reductions in the consumption of various foods rich in fat, sugar, and salt. Red meat, specifically, is included within the fat category. The Congressional report calls for a reduction in overall fat intake by 10 percent, replacing meat with fish or fowl.[20] The report recommends that more protein can be obtained from fish and poultry, and that these should be eaten instead of red meat. Poultry, like fish, contains less fat than red meat.

A rich supply of minerals and vitamins may also be found in shellfish. The protein content of shellfish is the same as in fish and land animals. Its main value consists in its wealth of iron, copper, and iodine. When eaten raw, oysters offer a substantial vitamin C content, and are a good substitute for fresh fruit and vegetables.[21] However, shellfish is relatively high in cholesterol.

In order to ascertain what the food-eating patterns of early man consisted of--and what the "natural" diet of man should be today--anthropologists have studied the eating habits of our closest animal relatives, chimpanzees and gorillas. Their conclusions are neither a justification nor an explanation for the eating patterns of man. But the physical similarities between the two suggest interesting parallels. Until the 1960s, chimpanzees were considered to be complete vegetarians. But then the first-hand observations by Jane van Lawick-Goodal in Tanganyika revealed that chimpanzees occasionally eat meat. On the other hand, in Uganda in 1962 Vernon and Frances Reynolds also observed chimpanzees but failed to find any evidence of meat eating. In direct observations of gorillas in the wild, both Dian Fossey in Rwanda and George Schaller in East and Central Africa, found gorillas to be completely vegetarian in their natural habitat.[1] However, they will eat meat while confined in zoos.

These observations fail to define what the natural diet of man should be. Among anthropologists, there is a controversy as to whether primitive man was carnivorous or vegetarian. There is evidence for both views. Richard B. Lee lived for two years among the Kung Bushmen in the Kalahari Desert of Botswana. He reported that, by weight, 50% of the Bushmen's vegetable diet consisted of the mongongo nut. Meat is eaten only on special occasions. Besides the mongongo nut, the Bushmen's diet consisted of 84 species of edible plants, including 20 varieties of fruits, berries, and melons, and 30 types of roots and bulbs. Lee did not observe one case of nutritional deficiency,[1] suggesting that early human societies could have been vegetarian.

Robert Ardrey, author of *The Hunting Hypothesis*,[22] refutes the vegetarian hypothesis of early man. He dismisses Lee's data, claiming that the particular tribe examined was unrepresentative of Bushmen in general. Ardrey contends that primitive man was carnivorous. "Supreme, above all other reasons for rejecting the hunting hypothesis, is anthropology's will to believe in primal man happily, healthily chewing his mongongo nuts. Such an anthropological wonder can bear comparison...to the Rosseauesque image of primal innocence, primal goodness, that grips our minds."

Ardrey asserts that the Ice Age winters offer confirmation of his hunting hypothesis. Those authorities who insist that early man was dependent on plant foods, says Ardrey, forget that during the Ice Age in Europe and Asia there weren't any. To guarantee survival during these cold periods, man had to have been preadapted to a diet consisting exclusively of meat. Those modern hunting peoples such as the Eskimo, Ardrey contends, who live under ecologically comparable conditions as Ice Age man, consume a fully-nutritious diet of no more than 10% plant food.

Arctic regions provide few plants, roots, or fruits. An Eskimo diet consists of the meat of the seal, whale, narwhale, walrus, aquatic birds and their eggs, and such

land animals as the bear, fox, seal, and deer. Shellfish is eaten when found in the stomach of other animals. Eskimos consume most of their meat raw. The vitamin content of meat rises when the glands, brains, entrails, and organs are consumed.[21] If properly cooked, organs and tissues can supply every vitamin and mineral needed with the exception of calcium. Raw liver contains vitamin C and A. Other organs supply elements of the vitamin B complex and vitamin D. It has been suggested by one author[21] that "the consumption of brain, heart, kidney, liver, spleen, and other organs becomes an important dietary goal of our times. By discarding these organs we throw away practically all of the animal's vitamins and minerals just as we lose the most valuable substances of vegetables by discarding the water in which they have been cooked for long periods."

Throughout history, dietary goals have played a large role in different civilizations. Vegetarianism, especially, has never been without its advocates during any period of time.[23] Most familiar in this category are Pythagoras, Buddha, Leonardo da Vinci, Montaigne, Percy Bysshe Shelley, and Benjamin Franklin, among others. Two contemporary Christian Protestant sects--the Bible Christians and the Seventh Day Adventists--require that their followers maintain a vegetarian food habit.

The largest group of vegetarians in the world today are the Hindus in India. Almost synonymous with vegetarianism and Hinduism in India is the sacred cow, which is forbidden to be killed or eaten, though younger and more liberal Indians now eat meat without regard for the established "reactionary" ways. The vegetarian basis of Hinduism is founded on the belief that the exclusion of flesh foods from the diet contributes to the principle of *ahimsa*--or non-violence. Thus, as Gandhi made known to the world, vegetarianism becomes a moral principle.

Some orthodox Jews abstain from meat eating entirely, but are commonly deemed kosher rather than vegetarian eaters. This is not to say that all Jews who eat kosher are vegetarians. The kosher laws are intended mainly to guide the observant Jew in the kosher preparation of meat. The prohibition against the consumption of blood (Leviticus 7:26-27; 17:10-14) is the basis for the process of koshering meat.[24] The purpose of the process is to draw out and drain the meat of non-veinal blood, before it is cooked. The blood can be removed either by salting the meat, or by roasting it over an open fire. The term *kasher,* or kosher, was originally used in the Bible in the sense of "fit" or "proper." From the point of view of the Jewish dietary laws all fruit and vegetables are "fit" for consumption, and do not require, as in the preparation of meat, a Rabbi's certification that a certain food has been koshered. This is based upon the first dietary directive in the Bible: "Behold I have given you every herb yielding seed which is upon the face of the earth and every tree..." (Genesis 1:29).

An ancient sect of Jews, the Essenes, lived rigid, ascetic lives in the proximity of the Dead Sea area. The Essenes cultivated and ate simple vegetarian food. Ancient historians such as Josephus and Pliny the Elder wrote about these communities.[25] The Essenes withdrew from the cities and organized society of their time (the 1st century) and formed a society of their own. There is speculation that John the Baptist was a member of the Essene community, and possibly Jesus Christ, though

Jesus was not an ascetic like John the Baptist, and Jesus ate meat.

In 1947 the American Vegetarian Party was born. In the presidential elections of 1948 a Vegetarian Party slate was nominated; its campaign motto was a diet without the flesh of meat, fish, or fowl. Symon Gould was the real force behind the Party, though it wasn't until 1960 that Gould himself actually ran for President. In 1962 he campaigned for state senator from New York against Jacob Javits, keeping vegetarianism and pacifism in the forefront of the campaign. When Gould died in 1963, the American Vegetarian Party died with him.[1]

It would be impossible to accurately count the number of vegetarians in America today. A conservative estimate may be four million persons. Most of these would be lacto- or lacto-ovo-vegetarians; there are few vegans in the U.S. In recent years, however, there appears to have been a resurgence of vegetarianism in America, especially on college campuses. One reason for this may be the financial savings in excluding meat from the diet, or it could be due to ethical beliefs of "returning to nature." Whatever the reason, an individual contemplating a vegetarian regimen should become familiar with the potential dangers. With proper knowledge and education, a vegetarian will encounter no difficulty in obtaining the full nutritional requirements. Vegetarianism is not a recent fad, but it can be an enjoyable alternate to meat, providing a sound protein diet from the abundant sources that the earth provides.

Apart from all the reasons cited above it is also argued by vegetarians that meat consumption is an unfair use of land resources to serve the rich. It requires a much larger per capita expenditure of energy and land to support a meat eating population. It is all the more ironical that the U.S. should be thought of as the world's breadbasket since we, like the Argentinians, are so meat oriented. Were we to feed less grain to animals for meat consumption we would have much more to export.

This is a very narrow view of the world's food and agricultural problems. The meat-eating habits of Americans, even if changed, will not serve the basic problems of agriculture in India, the USSR, or any other country. Certainly a drastic reduction in per capita meat consumption would be healthy.

You can support considerable intake of meat-fat and cholesterol if you match it with a strong regimen of exercise. I've never known a person who performed heavy labor who could survive without meat. Weight lifters, football players, and other athletes consume large quantities of meat without apparent damage to the cardiovascular system. It is when they stop exercising but maintain established meat-eating habits that they get into trouble.

Until some better evidence comes along the moderate, well-balanced diet is the safest course of action. Knowing how often and how easily we succumb to celebrations and feasts, we need to balance such abuse of our bodies with exercise and occasional fasting. The ideal weekly regimen for me would be a vegetarian meal on Monday, a T-Bone steak on Tuesday, a dairy-vegetarian meal on Wednesday, a seafood dinner on Thursday, a chicken dinner for Friday, and on Saturday a 12-course Chinese dinner to be shared with as many friends. On the last day I might fast, as a convenient way of watching my weight.

REFERENCES

1. **Barkas J.** *The vegetarian passion.* New York: Charles Scribner's Sons, 1975.
2. **Meeker B K.** Rising world meat consumption--and national policies. *Foreign Agriculture* 14:2-5, 15, 8 November 1976.
3. **Lappe F M.** *Diet for a small planet.* New York: Ballantine Books, 1975.
4. **Guthrie H A.** *Introduction to nutrition.* St. Louis: C.V. Mosby Co., 1967.
5. **Stare F.** Personal communication, 31 October 1976.
6. **Combs G.** Personal communication, 18 November 1976.
7. **Crosby W H.** Can a vegetarian be well nourished? *Journal of the American Medical Association* 233:898, 1975.
8. **Dwyer J T.** Physical measurements of vegetarian infants and preschool children. Paper presented at meeting of the American Society for Clinical Nutrition, Atlantic City, New Jersey, 1 May 1976. (Paper abstract in: *American Journal of Clinical Nutrition* 29:477, 1976.)
9. Committee on Nutrition Misinformation, Food and Nutrition Board, National Research Council, National Academy of Science. Vegetarian diets. *Journal of the American Dietary Association* 65:121-22, 1974.
10. **Jenkins R R.** Health implications of the vegetarian diet. *Journal of the American Collegiate Health Association* 24:68-71, 1975.
11. Introduction to anemia. *Harvard Medical School Health Letter* 1(12):2, October, 1976.
12. Dietary advice for a pregnant, vegetarian patient. *British Medical Journal* 3:689, 29 September 1973.
13. **Keys A.** The diet and plasma lipids in the etiology of coronary heart disease. In: *Coronary Heart Disease.* Edited by Russek HI & Zohman BL, Philadelphia: Lippincott Co., 1971, p. 59-75.
14. **Sacks F M.** Blood pressure in vegetarians. Paper presented at meeting of the Society for Epidemiologic Research, Berkeley, California, June 19-22, 1974. (Paper abstract in: *American Journal of Epidemiology* 100:525, 1974).
15. **Groom-Napier CO.** *Vegetarianism, a cure for intemperance.* London: William Tweedie, 1875.
16. **Gandhi M K.** *Diet and diet reform.* Ahmedabad, India: Navajivan Publishing House, 1949.
17. **Mendelssohn K.** *The secret of western domination.* New York: Praeger, 1976.
18. **Atwater W O.** How food nourishes the body. *Century Magazine* 34:50, 1887.
19. **Twain M.** Memoranda. *Galaxy* 11:159, 1871.
20. **Burros M.** Hill report asks diet changes. *Washington Post* 15 January 1977, p. A3.
21. **Graubard M.** *Man's food: its rhyme or reason.* New York: Macmillan, 1943.
22. **Ardrey R.** *The hunting hypothesis.* New York: Atheneum, 1976.
23. **Bryce A.** *World theories of diet.* London: Longmans, Green and Co., 1912.
24. **Rabinowicz H.** Dietary laws. *Encyclopaedia Judaica* (Jerusalem: Keter Publishing House Ltd., 1971) Vol. 6, p. 26-46.
25. **Flavius Josephus.** *The Jewish war.* London: William Heinemann Ltd., 1969.