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Vegetarian-Vegan Diet Forms and their Effects on Athletes

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ABSTRACT

It is known that vegan diets, where no animal products are used or consumed and vegetarian diets, where no animal meat is consumed in general, are quite popular today. There are also several sub-branches of vegan and vegetarian diets. The sub-branches of vegan diets are., zenmacrobiotic, fruvitarians and ravists. It is known that vegetarianism has different styles such as ovo, lacto, lacto-ovo, semi, pesco, polo. Today, it is obvious that studies are being conducted on sedentary and athletic individuals who integrate these diets into their lives. As it is known from such studies, it is an important factor that individuals who want to adopt these diets as a lifestyle should adapt to this life with the help of a suitable doctor and diet. In addition, it is very important to what extent individuals with any of these diets can get sufficient amounts of substances such as B12, iron, zinc, vitamin D and calcium from herbal products. Otherwise, it is obvious that many negative health factors may be encountered in individuals who want to switch to these diets incorrectly. In this context, the main purpose of the article is to examine what kind of a food consumption scheme vegan and vegetarian athletes go through and how they should go through it and to examine the data on what possible health problems are and may occur. At the same time, to examine the studies conducted on the positive and negative aspects of these diets on athletes and to try to reach a general opinion on this subject.

INTRODUCTION

Vegetarian diet, in short, is the consumption of no animal meat (meat, fish, chicken and other marine animals) in the diet and the consumption of secondary animal foods (milk and dairy products, eggs) in limited and small amounts or optionally. Vegan diet, on the other hand, is a diet and a lifestyle in which no animal products are used or consumed (including wool, silk, leather) along with secondary animal foods^[1]. Vegetarianism is a diet that includes the consumption of plant-based foods in general and predominantly. Vegetarian is a general name given to individuals who consume plant-based nutrition products and do not consume animal foods (such as eggs, red meat, chicken, fish, milk and foods made from milk) in limited amounts or at all. Vegetarian diet does not include poultry, fish, meat., vegan diet does not include dairy products and eggs beyond that^[2]. Vegetarian and vegan diets, which constitute the daily nutrition and energy sources of individuals, can be adopted by the athlete population, just like every other person. It is known that vegetarian and vegan athletes need different diets than omnivorous individuals^[3]. It is more difficult for these athletes to maintain their protein intake and muscle creatine stores, especially in plant-based diets. Professional support is needed due to such situations^[4]. It is known that the vegetarian diet has been accepted as a natural diet of humanity throughout history. It is known that this diet has generally emerged due to economic factors. One of these facts is the finding that growing plant-based products on a certain amount of land can feed a greater number of individuals in a shorter time and more cheaply than raising animals. It is said that moral judgments and values opposing the slaughter of animals have also contributed to the development of vegetarian nutrition in recent years. It is seen that the killing of animals is opposed through animal protection associations in many countries and the necessity of not using meat in nutrition is brought to the forefront. Today, there are communities that adopt vegetarianism within the scope of religious dimensions, as well as those who adopt a vegetarian diet for the purpose of protection from certain chronic diseases such as diabetes, cardiovascular diseases, hypertension and cancer and it is known that the number of these individuals is increasing day by day^[5].

Vegetarian Diets:

Vegan Diet: Those who follow this diet do not consume any animal products and only provide plant-based nutrition. It is known that the number of people who adopt a vegan diet is quite low today. It is also seen that veganism has subgroups such as zenmacrobiotic, fruvitarins and ravists.

- **Zenmacrobiotic:** This diet consists of grains, legumes, vegetables and fruits. Some people also

exclude fruits, legumes and vegetables from their diet and eat only grains.

- **Ravists:** These people do not believe in cooking foods. Cooking foods means that their nutritional values will be lost for them.
- **Fruvitarins:** These people only eat vegetables and fruits such as tomatoes, zucchini, cucumbers and peppers, which are considered fruits from a botanical perspective^[5].

Lacto-Ovo Vegetarianism: In this diet., meat, fish and poultry are completely abandoned, but eggs, milk and dairy products can be consumed. In this way, you can obtain the foods you realize you need from animal foods^[6]. This diet is based on the belief in Buddhism and Jainism that life is sacred and that killing animals is against moral values. It is a vegetarian diet that is quite popular nowadays^[5].

Lacto Vegetarianism: This diet includes the consumption of dairy products such as milk, cheese, eggs, yogurt and ice cream. It does not include the use of eggs, meat and fish^[7]. In this diet, the consumption of foods such as honey, milk and milk is allowed, but meat and eggs are not consumed^[8].

Ovo Vegetarianism: Egg consumption is also included in the diet along with the consumption of plant foods. In addition, meat and milk are not consumed^[5].

Polo Vegetarianism: It is a vegetarian diet that consumes only poultry in addition to plant foods^[9]. Red meat is not consumed in this diet. Along with plant foods, only poultry such as Türkiye and chicken are consumed as animal food^[10].

Pesko Vegetarianism: Red meat is not consumed in this diet either. In addition to plant foods, only fish species, mussels and aquatic products are consumed as animal food^[10].

Semi-Vegetarianism: They do not consume red meat, but consume very small amounts of chicken and fish^[5]. It is a general vegetarian diet. They sometimes consume poultry, meat and fish^[11].

Fruitarian: Classified as botanical fruits., nuts, vegetables and fruits are consumed^[12].

Vegan and Vegetarian Athlete Nutrition: The main purpose of athlete nutrition is to ensure that athletes consume balanced and sufficient nutrients in accordance with their age, gender, physical activity level, energy expenditure and diet^[13]. While it is generally recommended that athletes eat a diet rich in carbohydrates, it is also recommended that they consume vitamins, minerals and proteins in sufficient

amounts and that the energy provided by fat is at a slightly lower level compared to sedentary individuals^[14-16]. Vegetarian athletes who cannot consume animal foods rich in vitamin B12 can meet their B12 needs with soy products and grains. At the same time, vegetarian athletes are recommended to consume green leafy vegetables, legumes and dried fruits and iron-enriched grain products in order to increase their iron intake rates. In order to provide sufficient calcium, calcium-rich tofu, calcium-enriched fruit juices and green leafy vegetables should also be consumed. Zinc bioavailability is higher in vegetarian individuals. The inclusion of oilseeds, legumes and whole grains in nutritional plans is extremely important in terms of zinc intake^[15]. In the event of insufficient intake of the energy required for the body through food for a long time, the energy needed by athletes is provided by the fat stores in the body^[17,18]. In such cases, along with weight loss, there may be a decrease in muscle tissues and performance may decrease with loss of endurance and strength^[19]. When looking at the results of different studies, endurance athletes are seen to have more advantages because they consume complex carbohydrates. It is considered necessary to adapt a menu plan accordingly, considering that athletes who work with strength need more protein consumption^[4]. Athlete nutrition is a type of nutrition that is considered important to balance efficiently and is currently considered as a different title under the name of sports medicine and is adapted for athletes^[16]. It is also known that this type of nutrition has different criteria and difficulties^[4].

Findings Regarding Vegan, Vegetarian Nutrition and its Effects on Sports Performance: Nutritional habits can be significantly affected by psychological and environmental factors^[20]. It is known that the number of athletes who have adopted vegetarianism is increasing day by day due to environmental factors such as religious beliefs, health status and successful results of athletes with a vegetarian lifestyle^[21]. A study has shown that athletes with a vegan diet can receive sufficient amounts of energy, micro and macro nutrients like athletes with other diets (omnivores), but the protein quality of vegan athletes' diets is lower than other athletes. In addition, it has been seen among the hypotheses of this study that vegan nutrition can increase the athlete's quality of life and that this diet positively affects the anthropometric measurements of athletes^[12]. However, sudden decisions and unplanned changes in the nutrition program can cause possible health problems in a short time^[21]. In another study, it was mentioned that protein intake has been considered very important for athletes for endurance, general growth and muscle development since the past and until recently, the

dominant view was that protein intake could only be obtained from animal foods. However, healthy plant-based foods are full of amino acids that our bodies need to create protein. When one or two of these foods are consumed at almost every meal, our bodies will also receive the proteins that our muscles need. Some of these products: Foods such as almonds, chia seeds, oats, cereals, pumpkin seeds, tofu, kidney beans, chickpeas, broccoli, edamame, green leafy vegetables, quinoa, lentils, peas, black beans, hemp seeds are the foods that contain the most protein^[22]. Ensuring sufficient amounts of micro and macro nutrients will be beneficial for athletes before, during and after training. It is obvious that athletes with a vegan and vegetarian diet need a different and varied nutritional level. In a well-balanced vegetarian and vegan diet that includes protein sources from plant-based foods, it is possible for athletes to get enough protein, iron, various micro nutrients and vitamin D^[4]. While 94-97% of nutrients from milk and meat are digested, 78-85% of legumes and grains are digested. For this reason, it is known that a 10% increase in protein intake is recommended for individuals on a vegetarian diet^[15]. In a study conducted, statistically significant differences were found in the evaluation of the protein quality of the diets of vegan and omnivorous athletes. It was observed that the actual protein intake of athletes with an omnivorous diet was significantly higher than that of athletes on a vegan diet. Again, in this study, it was stated that there were statistically significant differences in the intake of iron, vitamin B6, magnesium, fiber and vitamin C of athletes due to nutritional intake patterns. It has been determined that athletes on a vegan diet have higher levels of vitamin B6 and C, thiamine, magnesium, folate, fiber and iron intake, while athletes on an omnivorous diet have higher levels of B12 intake^[12]. It is known that the main energy source during training is glycogen, which is stored in limited amounts in the muscles and liver. Increasing endogenous glycogen stores will be possible with carbohydrate loading at an appropriate time. With the increase in these stores, an increase in performance will be achieved and fatigue will be reduced to a minimum level^[23]. In this study, it was also mentioned that due to the low-fat diet preferred, a decrease in testosterone levels may be observed in male athletes on a vegetarian diet compared to athletes or individuals who provide omnivorous food intake and that there is no statistically and definitive difference in androgen levels between male individuals with an omnivorous diet and men who adopt a vegetarian diet. In female athletes who adopt a vegetarian diet, having this diet can cause some mineral and vitamin deficiencies. Some of the

deficiencies in female athletes who are vegetarians are., hormonal imbalances, skeletal-muscle injuries, iron deficiency anemia, menstrual disorders and weakness in sports performance are also mentioned in this study^[24]. In order to prevent such negative situations, some of the vitamins and minerals that athletes should take in their nutrition plans are as follows: Calcium: Calcium, which is found in many foods, is generally found in dairy products.

CONCLUSION

Ensuring sufficient energy intake is a very important factor for athletes on a vegetarian diet. Insufficient energy intake can lead to muscle and weight loss, which can lead to a reduced work capacity, decreased strength and difficulty adapting to training. In such cases, the athlete may leave the competition or training he/she is in or be eliminated. Due to such situations, the calculations of the athletes' energy rates should be made specifically by a dietitian. The nutrition plan should be adjusted and implemented after the results. Animal-based proteins are richer in essential amino acids than plant-based proteins. Since vegetarian-based athletes do not use animal-based proteins, this balance should be tried to be achieved with the help of plant-based and milk-based proteins they consume. There is no need for additional protein intake support by providing balanced and sufficient protein intake with the use of foods such as soy products, grains and legumes with high protein content^[24]. The sub-branches of vegetarianism and nutritional intake patterns may differ in terms of vegetarianism. Athletes on a vegan diet are seen as risky in terms of calcium, vitamin D and iron intake, as they are insufficient in not only dairy products but also protein consumption. Lacto-ovo and lacto vegetarians who include milk and dairy products in their diets more than meet the calcium intake rate, while individuals who adopt a pesco vegetarian diet are seen as advantageous in terms of omega fatty acid intake. Studies have shown that vegan and vegetarian athletes who do not use certain food source groups are recommended to receive professional support and conduct their studies with the help of a dietitian. It is clear that vegetarian and vegan athletes need a different diet and style than other individuals^[4]. When the results of a study comparing people with vegetarian and omnivorous nutritional styles are examined., It has been stated that the protein intake that can be provided is sufficient to meet total energy needs, plant sources containing protein support athletic performances equally to animal proteins, vegetarians have lower average muscle creatinine and

their muscle concentrations are lower than omnivorous individuals, which may affect maximum exercise performance. In addition, it has been mentioned in this study that especially vegetarian female athletes are at great risk for non-anemic iron deficiency, which causes their endurance performance to be limited and that appropriately supported vegetarian diets greatly support their athletic performances^[25]. Another study has also stated that when the results are taken into account in general, vegan diets contain less fat, protein, energy, iodine, calcium, n-3 fatty acids, vitamin B12 compared to omnivorous diets and more fiber, micro nutrients, carbohydrates, antioxidants and photochemical. Again, as mentioned in this study, it was also mentioned that, except for some differences observed in studies comparing vegan and omnivorous athletes, there is no negative or positive effect of vegan diet on performance. It is considered extremely important to determine the nutritional status of athletes who have adopted a vegan diet and to perform health checks, and to take vitamins D and B12, n-3 fatty acids, protein, zinc, calcium, creatinine, carnitine, iodine, etc., which are not taken in sufficient amounts by vegan diet, externally through supplements if necessary and to monitor these intakes. As a result of inadequate intake of such nutrients., It has also been mentioned in the studies that it should not be forgotten that athletes can be affected both in terms of health and performance with problems such as low bone mineral density, problems in growth and development, decrease in muscle mass and strength, decrease in anaerobic and aerobic performance, increase in injury rates, decrease in resistance to stress and diseases, decrease in oxygen intake, increase in lactate accumulation, muscle fatigue and delayed recovery. At the same time, it has been mentioned that vegan sports nutrition should be planned, monitored and implemented with the help of a sports dietitian^[26,27]. As a result, it is seen as extremely important for athletes who are vegetarian and vegan to adopt these nutritional styles with the help of a dietitian in order to increase their performance. It can be said that athletes who prefer a vegetarian and vegan diet, who need a balanced and regularly planned nutritional scheme, should include a plant and fiber-based food consumption with high nutritional value in terms of protein in their diet in order to increase their energy intake rates. It has also been noted that in athletes with a vegetarian diet, the consumption of plant-based foods with protein content supports athletic performance in a way that is equivalent to animal proteins. In athletes with a vegan diet, it is considered

important to take some vitamins and minerals that are not taken in sufficient amounts through external supplements.

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