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## Significance of vegetarian diet on athlete's nutritional status and physical performance: A review

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#### Abstract

With the growth of social media as a platform to share information, vegetarian food habit is becoming more visible, and could be becoming more accepted in sports and in the health and fitness industry. However, to date, there appears to be a lack of literature that discusses how to manage vegetarian diets for athletic purposes. The study's primary goal was to identify the nutrient content of vegetarian diet and the importance of vegetarian diet athletes. Secondary sources were used to collect data. It was discovered that vegetarian diet contains a wide range of nutrients that have a variety of positive health effects and enhancement in physical performance. Strategic management of food and appropriate supplementation, nutritive vegetarian diet can be designed to achieve the dietary needs of most athletes satisfactorily. As a result, to comprehend the significance of vegetarian diet empirical research is needed to examine the effects of vegetarian diets in athletic populations however, especially if this movement grows in popularity, to ensure that the health and performance of athletic vegetarian is optimised in accordance with developments in sports nutrition knowledge.

**Keywords:** Vegetarian diets, athletes and nutrition

#### Introduction

In recent studies nutritional and dietary practices of Indian athletes are found to be reportedly subnormal. Most studies on the nutrient intake of elite Indian athletes report an inadequate intake, with lower biochemical profiles such as haemoglobin, anthropometry, and eating disorders. The relationship between poor dietary intake and anthropometry, physiological and performance parameters remains unexplored. Nutrition education is frequently reported to be lacking in sports programmes across the country. In India, there is a scarcity of nutrition education interventions in various sports. A well-balanced diet helps to improve athletic performance and optimise training adaptations. To avoid deficiencies, limit fatigue, and replenish energy reserves, athletes' diets should be adequate in both quality and quantity. Athletic performance is determined by macronutrient and micronutrient intake, as well as the availability of stored energy substrates to power muscle contraction. A well-balanced diet may also help athletes' immune systems function, reduce inflammation, as well as improve recovery and injury repair. Even in ancient times, the concept of vegetarian or vegan diets has been strongly linked to sports and exercise. However, since 2017, there has been a greater frequency of publication of review articles on veganism in sports than ever before, all of which contribute to and reflect the growing scientific interest in the connections between a vegan diet and sport and exercise.

Interest in vegetarian and vegan diets is growing, not only among the general population, but also among elite athletes. Vegetarian diets may reduce the risk of chronic diseases and have been linked to ergogenic benefits for athletes in terms of exercise performance and recovery. A vegetarian was traditionally thought to be deficient in certain micronutrients (iron, zinc, calcium, iodine, vitamin A, B2, B12, D), as well as protein, omega-3 fatty acids, and total energy requirements. A vegetarian diet, on the other hand, typically contains more complex carbohydrates, dietary fibre, magnesium, nitrates, folic acid, vitamin C and E, carotenoids, and other phytochemicals, which may provide athletes with performance benefits.

A vegetarian or vegan diet can meet all of an athlete's nutritional needs if properly planned. Certain macro- and micronutrient intake considerations, such as iron, are unique to a plant-based diet. Zinc, calcium, vitamin A, vitamins B2 and B12, iodine, vitamin D and total energy intake are all important. A vegetarian athlete's protein requirements are no different than a non-vegetarian athlete's, as long as the plant-based athlete can meet EAA (including leucine) requirements and total protein intake throughout the day.

An athlete can also enjoy comparable strength/power, aerobic and anaerobic exercise performance with proper meal planning.

### Methodology

Starting with 2002 to present 2022 the published term papers, review papers and write-ups from internet which are in English concerning to athletic nutrition, vegetarian diet and its impact on athlete's health and physical performance. A number of data collection sources and web browsers, together with Google scholar, Research Gate, Krishikosh, Academia were used to search the articles related to the study. The references mentioned in printed publications were also carefully examined in order to find the appropriate research papers. Most frequently used terms like "nutrient content in vegetarian diet," "importance vegetarian diet," "sports nutrition," etc. were used as search terms to find relevant research publications.

### Discussion of review

The female athlete vegetarians were more likely than non-vegetarians to engage in strenuous physical activity observed by Barr *et al.* (2014). They also indicated that they were in the maintenance stage of exercise more frequently, implying a more consistent and long-term commitment to physical activity. This divide did not exist among male respondents. Another lifestyle choice investigated in this study was smoking. Vegetarian respondents were less likely to be smokers in both male and female participants. Avoiding this behavior is a major indicator of living a healthy lifestyle. The survey results show that vegetarian adults lead a healthier lifestyle.

Berning (2015) suggested that vegetarian athlete must carefully plan to avoid nutritional deficiencies and a negative impact on performance. Vegetarian athletes typically consume a higher proportion of their energy as carbohydrates. Athletes who engage in heavy training will benefit from increasing their dietary carbohydrates. Athletes should not attempt vegan diets without prior experience or consultation with a dietitian or health care provider. Athletes should choose a wide variety of foods and ensure that their energy intake is adequate to meet their needs when planning vegetarian diets of any kind. Vegan diets should be considered only if an athlete is willing to devote time and effort to learning the proper food combinations and amounts.

The health benefits of vegetarian and vegan diets are well recorded. However, data on their suitability for the unique nutritional needs of endurance runners is limited. Wirnitzer *et al.* (2018) <sup>[11]</sup> investigated the health status of vegetarian (VER) and vegan endurance runners (VGR) and compare it to omnivorous endurance runners (OR). Findings support the idea that following a vegetarian diet, particularly a vegan diet, is associated with good health and thus, at least an equal alternative to an omnivorous diet for endurance runners.

Plant-based diets have long been associated with improved physical and environmental health.

Lynch *et al.* (2018) examined the influence of plant-based diets on human physical health, environmental sustainability, and exercise performance capacity. Despite differences in macronutrient and micronutrient intake between vegetarians and omnivores, as well as some physiological differences such as lower total body creatine and plasma carnitine levels among vegetarians, exercise performance does not appear to

differ across multiple measures and types of activities.

Nebl *et al.* (2019) <sup>[9]</sup> conducted cross-sectional study to compare the micronutrient status of omnivorous, lacto-ovo-vegetarian and vegan recreational runners. Although less than 30 per cent of each group had depleted iron stores, no subject had iron deficiency anemia. The needs of the athlete for vitamin B12, vitamin D and iron can be satisfied by a well-planned, health-conscious lacto-ovo-vegetarian and vegan diet that also includes supplements.

The ability of plant-based regimens to lower risk and improve performance was examined by Barnard *et al.* (2019) <sup>[11]</sup>. Plants are typically high in carbohydrates, they promote efficient glycogen storage. They may improve vascular flow and tissue oxygenation by lowering blood viscosity and improving arterial flexibility and endothelial function. Many vegetables, fruits, and other plant-based foods are high in antioxidants, which aid in the reduction of oxidative stress. Plant-based diets have also been shown to reduce inflammation indicators. These characteristics of plant-based diets may provide safety and performance benefits for endurance athletes.

Vegetarian diets are of interest to the general public and athletes due to their potential to improve health and athletic performance. To avoid deficiencies, regular dietary assessment and nutrient status monitoring should be implemented. According to Zhou *et al.* (2019) <sup>[12]</sup> eating a vegetarian diet has no effect on athletes' physical performance, either positively or negatively.

Athletes at all levels of competition can meet their nutrient and energy needs on a vegetarian diet that contains a variety of foods. Meyer (2018) <sup>[6]</sup> suggested that a plant-based diet may provide numerous health benefits to both athletes and nonathletes, there is currently little evidence that vegetarian diets are superior to omnivorous diets for improving athletic training and performance.

Vegetarian and vegan diets are becoming increasingly popular, not only among the general population but also among elite athletes. Vegetarian diets may reduce the risk of chronic diseases and have ergogenic benefits for athletes in terms of exercise performance and recovery. Vitale *et al.* (2021) <sup>[10]</sup> concluded that with proper meal planning, an athlete can meet all their nutritional needs with foods derived from plants without any loss in physical performance.

Wilborn *et al.* (2022) concluded that several factors, including the consumption of a balanced, nutrient and energy dense diet, careful training, and adequate rest, serve as cornerstones to improve athletic performance and optimise training adaptations. In some cases, using a limited number of nutritional supplements that have been shown in studies to improve energy availability (e.g., sports drinks, carbohydrate, creatine, caffeine, -alanine, etc.) and/or promote recovery (carbohydrate, protein, essential amino acids, etc.) can be beneficial.

Therefore, vegetarian diet has been shown to be a crucial for athletes and sports person. A significant amount of protein, iron and vitamins are also provided vegetarian and plant based diet. Additionally vegetarian diets causes less pollution to environment.

### Conclusion

To recognize the nutrient content of the vegetarian diets and their benefits to athletes is the study's leading purpose. On the topic the benefits of vegetarian diets on athletes small number of studies are published till now. Through review of literature

it was found that till now vegetarian and vegan diets have vast variety of nutrients, they have a variety of positive health effects and enhance physical performance also. Vegetarian diet is cheaper than non – vegetarian diet and it is environment friendly also. Sports persons are not aware about their benefits as they can be consumed in any sports or physical activity. They contain large amount of carbohydrates, calcium, iron and vitamins which are beneficial for performance. Their effects on blood flow, body composition, antioxidant capacity, systemic inflammation, and glycogen storage all contribute to improved performance and accelerated recovery in endurance sports. These characteristics serve as a scientific foundation for the endurance athletes. Hence to understand benefits of vegetarian diets more research is needed to provide accurate information and encourage athletes to make healthy dietary changes.

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