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## International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

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# Vegetarian Diet: An Overview through the Perspective of Quality of Life Domains

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**ABSTRACT:** Vegetarianism has gained more visibility in recent years. Despite the well-described effects of a vegetarian diet on health, its influence on the quality of life of the individuals who follow it still needs to be properly investigated. Quality of life relates to a subjective perception of well-being and functionality, and encompasses four main life domains: physical, psychological, social, and environmental. The adoption of a vegetarian diet, despite being a dietary pattern, could potentially influence and be influenced by all of these domains, either positively or negatively. This review aims to present an overview of the background, conceptualization, features, and potential effects of vegetarianism in all quality of life domains. The choice of adopting a vegetarian diet could have positive outcomes, such as better physical health, positive feelings related to the adoption of a morally correct attitude, an increased sense of belonging (to a vegetarian community), and lower environmental impact. Other factors, however, could have a negative impact on the quality of life of those choosing to abstain from meats or other animal products, especially when they go beyond one's control. These include the environment, the social/cultural group in which a person is inserted, gender-based differences, economic aspects, and a limited access to a wide variety of plant-based foods. It is important to understand all the effects of adopting a vegetarian diet—beyond its nutritional aspects. Not only do studies in this area provide more consistent data, but they may also contribute to mitigating all factors that might prevent individuals from adopting a vegetarian diet, or that may have a negative impact on the quality of life of those who already follow it.

**KEYWORDS:** quality of life; quality of life domains; vegetarian diet; vegetarianism

## I. INTRODUCTION

Vegetarianism has its origins in 3200 BC, when ancient Egyptian civilizations started adopting vegetarian diets based on the belief that abstaining from meat consumption would facilitate reincarnation. In India, another important cradle of vegetarianism, this practice was also associated with the fact that Hindus see cows as sacred and uphold nonviolence principles. Later, Greek philosophers also adopted a vegetarian diet, with Pythagoras being a leading figure among them—indeed, for many centuries, vegetarianism was known as the “Pythagorean” diet. In the Christian Era, vegetarianism lost its strength, gaining some visibility again only in the late 18th and early 19th centuries, when Darwin's theory of evolution challenged the Church's views that animals had no souls, and that their only purpose on Earth was to serve human beings.

Throughout history, the expansion of vegetarianism has been associated with religions that preach respect for all living beings and adopt nonviolence principles, such as Hinduism, Jainism, Sikhism, Buddhism, the Hare Krishna movement, and the Seventh-day Adventist Church. In addition, in the 20th and 21st centuries, science has observed several health benefits potentially associated with the reduction in meat consumption. Such benefits have strengthened the practice of vegetarianism around the world, and attracted more and more followers.

Currently, the worldwide prevalence of vegetarianism is not uniform. Asia is the continent with the highest prevalence, with 19 percent of the population adopting this practice. India, the single country with the highest prevalence in the world (almost 40 percent of the population), contributes to the results of the Asian continent. The prevalence in Africa and the Middle East is about 16 percent; and in Central and South America, 8 percent. The lowest prevalence of vegetarianism is found in North America (about 6 percent of the population are vegetarians) and Europe, where vegetarianism is adopted by only 5 percent of the population.



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In view of the recent growth in the number of individuals adopting a vegetarian diet, as well as the wider interest in the topic in recent years, it is critical to understand the different effects of vegetarianism on one's QoL. Therefore, this review aims to present an overview of the background, conceptualization, features and potential effects of vegetarianism considering all QoL domains.

### II. HISTORICAL BACKGROUND OF VEGETARIANISM

Over most of their 24 million years of evolution, humans' anthropoid ancestors were almost exclusively vegetarian, except for the occasional ingestion of insects and larvae. Anatomically, both humans and their ancestors present significant features that distance them from meat-eating animals, including, for example, wide flat teeth and more mobile jaws, which facilitate the chewing of grains and seeds, as opposed to sharp teeth and jaw movements on a vertical axis, which are characteristic of carnivores. In addition, carnivorous animals have shorter intestines, which enable the rapid elimination of toxins, unlike humans and other predominantly herbivorous animals, with long intestines that allow longer digestion, fermentation and absorption processes.

In recent years, vegetarianism has gained more visibility and a greater number of followers. Rosenfeld describes a great expansion in the scientific literature on the psychological and social effects of choosing a vegetarian diet. Some topics started to attract more attention, such as motivations; barriers to adopting such diets; differences between vegetarians and vegans; morality; and gender differences. New research lines have emerged to explore issues associated with personal identity and social and cultural experiences.

There are several types of vegetarian diets commonly described in the literature. The most consensual classification consists of four different types, namely: (1) flexitarian or semivegetarian diet, in which people consume meat sporadically (up to once a week) or exclude red meat, but consume white meat; (2) pesco-vegetarian or pescatarian diet, which excludes all meats, except fish and seafood; (3) ovolactovegetarian diet, which excludes all types of meat, but allows products of animal origin, such as dairy products and eggs; and (4) strict vegetarianism, which excludes all products of animal origin.

In addition to these categories, other diets can be considered subclassifications of vegetarianism, namely: (1) raw vegan diet, which is mostly based on food in its most natural (raw) state, with an emphasis on the choice of organic and self-grown products; (2) frugal or frugivorous diet, which is similar to the raw vegan diet, but with 70–80 percent of the diet being composed of fruits, with a small proportion of nuts, seeds and some vegetables; and (3) macrobiotic diets, which encompass various degrees of restriction but are primarily composed of whole grains, soybeans, algae and some vegetables.

### III. QUALITY OF LIFE

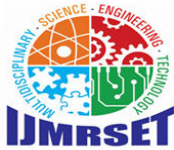
According to the WHO, QoL is a multifactorial concept that includes the following domains: physical (physical state), psychological (affective and cognitive state), social (interpersonal relationships and social roles in the lives of individuals) and environmental (quality of the environment in which individuals live). Conceptual, pragmatic and empirical dimensions, as well as spiritual and religious aspects, can also contribute to people's QoL and their ability to perform certain activities, or "functionality". Building on that, QoL is defined as "individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns".

#### *Physical Domain*

The physical domain refers to aspects as pain, discomfort, energy, fatigue, sleep, and rest. Aspects that positively contribute to a general feeling of physical well-being are therefore relevant for understanding QoL. These include better general health, lower rates of chronic and inflammatory diseases, and lifespan.

#### *Influence of Adopting a Vegetarian Diet on the Physical Domain Positive Influence*

Following a vegetarian diet may lead to better health outcomes and a lower risk of noncommunicable diseases, which could positively influence the QoL physical domain. A nutritionally adequate diet is essential to achieving



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and maintaining good overall health. A systematic review published by Parker and Vadiveloo compared the quality of vegetarian and nonvegetarian diets based on diet quality indexes. That review included 12 studies and showed that vegetarians have better diet quality results than omnivores. Furthermore, among vegetarians, vegans achieved the best results. Although different indexes were used in the studies, several common points allowed a combined analysis of the results. Higher consumption of fruits, green vegetables, whole grains, and vegetable sources of protein—and lower consumption of saturated fat and sodium— contributed to the best results found among vegetarians.

Vegetarian diets usually have a higher content of carbohydrates and fibers, in addition to lower levels of proteins and fats—in particular saturated fats. Studies comparing the microbiota of vegetarians and nonvegetarians show that a plant-based diet can benefit the diversity and profile of the bacteria that make up the intestinal microbiota. In addition to differences observed in the microbiota, with a more favorable bacterial profile, a vegetarian diet (with high consumption of whole foods, fruits, and vegetables) leads to increased production of metabolites from the fermentation of prebiotics and phytochemicals by these bacteria, which also have a positive effect on the host's health, both at intestinal and systemic levels, contributing to the prevention of chronic diseases.

Among chronic diseases, cardiovascular diseases account for 43.6 percent of deaths worldwide. Positive results in the control of cardiovascular disease risk factors were observed in clinical trials that promoted lifestyle changes, including adopting vegetarian, vegan, and plant-based diets. A review of observational studies conducted in 2018 assessed cardiovascular risk factors in vegans. In most countries, vegetarian diets were associated with a lower intake of energy and saturated fat, and a better cardiovascular profile (lower body weight, LDL cholesterol levels, blood pressure, fasting glucose, and triglycerides).

Several factors contribute to the reduction in risks and a better control of diabetes. The first one is vegetarians' better weight control. It is known that both obesity and the accumulation of visceral fat are linked to increased insulin resistance, which contributes to the onset of diabetes. Vegetarians' lower intake of saturated fats also contributes to reducing the risk of diabetes. It has been shown that reducing the consumption of saturated fats or replacing them with unsaturated fats may contribute to improving insulin sensitivity. Other factors, such as higher fiber intake, lower ferritin levels and lower intake of heme iron among vegetarians are also related to better insulin resistance and lower risk of diabetes.

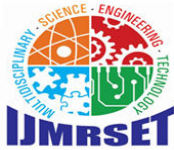
A vegetarian diet may also contribute to improving inflammation control. Foods of plant origin—when consumed in their most natural form—are rich in antioxidants, which can assist directly in the control of free radicals in the body (as in the case of antioxidant vitamins C and E), or even through several signaling pathways that modulate our immune response and the production of antioxidant compounds and enzymes, suppressing inflammatory responses. Therefore, a plant-based diet that is rich in fruits, vegetables, whole grains, seeds, and nuts can help to control inflammatory processes.

A vegetarian diet may also bring benefits regarding cancer prevention. In addition to vegetarians' better weight control results, which can be considered a protective factor against cancer, their higher consumption of dietary fibers could have protective effects due to the modulation of the intestinal microbiota. In addition, as previously described, excessive protein consumption can lead to an increased production of inflammatory metabolites by the intestinal microbiota, and the consumption of saturated fats (found mainly in foods of animal origin) is capable of activating Toll-like receptors in immune system cells. This stimulates the production of proinflammatory cytokines, and all these factors together can create a cancer-promoting environment.

### Negative Influence

Despite the potential health benefits from adopting a vegetarian diet, special attention should be given to the adequacy of iron, zinc, vitamins B12 and D, calcium, iodine, omega-3, and protein in adults, and especially in infants. Low intake of such nutrients could lead to nutritional deficiencies and impair an individual's health, with a negative impact on their QoL.

Vitamin B12 deficiency should be highlighted, as this nutrient can only be found in animal-origin foods.



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Vegetarians (especially vegans) have been shown to have lower levels of serum vitamin B12. In addition, increased homocysteine levels are observed, a metabolite that is elevated due to deficiency of vitamin B12 (and other nutrients), and which is associated with increased inflammation. B12 deficiency and increased homocysteine can lead to neurological problems, anemia and developmental delay in children, in addition to increasing the risks of cardiovascular disease, dementia, osteoporosis and death. For this reason, it is necessary to monitor and supplement vitamin B12 levels among this group, and possibly encourage the intake of fortified foods.

### Influence of the Physical Domain on the Adoption of a Vegetarian Diet Positive Influence

Seeking health improvement is one of the reasons why people chose to adopt a vegetarian diet. According to Hopwood et al., health was the most common reason why nonvegetarians considered adhering to a vegetarian diet. Vegetarianism is currently being more widely studied, and a growing number of scientific papers about the topic have been published over the past few years. Consequently, the topic has received more attention from the media, and more information is reaching the general population. As more people are informed about the health benefits of adopting a vegetarian diet, the need or desire to improve their health might serve as a trigger. A study conducted in Germany with 329 vegans showed that more than two-thirds of them (69.6 percent), despite having more than one motive for following the diet, included health and well-being among them.

In this sense, following a vegetarian diet is both the cause and consequence of the positive outcomes related to the physical domain. People who seek health improvement may be prone to adopting a vegetarian diet; and, once they do it, the physical benefits may serve as further motivation for maintaining their new diet.

### *Psychological Domain*

The psychological domain is related to positive or negative feelings, self-esteem and body image/appearance, and thinking/learning/memory/concentration. Different aspects of vegetarianism can either influence or be influenced by psychological factors.

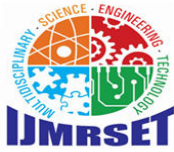
### Influence of Adopting a Vegetarian Diet on the Psychological Domain Positive Influence

Avoiding meat and other animal products can enhance positive feelings arising from the fact that person is adopting an attitude that confirms their beliefs. The positive psychological impact goes beyond the individual sphere, as it can also increase social connections with others adopting similar ideas and behaviors. According to Rosenfeld and Burrow, being a vegetarian goes beyond the choice of a dietary pattern, as it gives individuals a new social identity, which influences their way of thinking, behaving, and socializing. The adoption of a plant-based diet can have a positive effect on well-being and contentment, which could positively impact someone's QoL.

The different motivations for adopting vegetarianism are also able to influence individuals psychologically. Those who adopt vegetarianism for ethical reasons tend to create more aversion to meat due to the association between its consumption and animal suffering. Such individuals also exclude more animal foods and tend to adopt stricter diets than those who become vegetarians for health or environmental reasons. That does not necessarily implicate a negative outcome, though. As it has been shown by Cruwys et al., vegetarians and vegans are more likely to report no barriers to diet adherence (25.2 percent of vegans and 15.6 percent of vegetarians) when compared to individuals following a gluten-free, paleo, or weight-loss diet. Indeed, both vegans and vegetarians had higher diet adherence when compared to the other groups, which might be connected to positive psychological effects related to the social identification within the vegetarian/vegan community.

### Negative Influence

Potentially negative outcomes of vegetarianism in the psychological domain could be related to mental health impairment. The data related to the effect of vegetarianism on mental health are conflicting. Adopting a vegetarian diet was positively associated with a better mood in a cross-sectional study with Seventh-day Adventists. A study of South Asians living in the United States found that the likelihood of depression was 43 percent lower among vegetarians. However, a contrary association has also been observed: in the United Kingdom, a positive association of depressive symptoms was found in men, even after adjusting for confounding factors such as nutritional deficiencies and sociodemographic data. Similar results were found among adolescents in a study conducted in Turkey, in which higher levels of anxiety, as well as eating disorders, were observed. That study raises the possibility



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that a vegetarian diet might be adopted among young people as a way of limiting food intake, and that it might be related to preexisting eating disorders.

Discrepant results have already been observed in a study that evaluated mental health in representative population samples from Germany, Russia, and the United States, in addition to samples from students in China and Germany. An increase in anxiety and depression was observed only in the sample from China, but the result was considered mild since a vegetarian diet would explain only 1 percent of the variance in cases of depression and anxiety. In addition, the motivations that led Chinese students to adopt a vegetarian diet differed from those of the other groups studied, being more related to cultural and economic factors. A study with Chinese elderly people also found a positive association between adopting a plant-based diet and depression compared to a meat-based diet. However, the correlation was observed only in men.

A systematic review study carried out by Medawaretal. points out that, despite several health benefits related to adopting a vegetarian diet, its effect on mental health has yet to be properly studied. It is possible that nutritional deficiencies, such as lower levels of vitamin B12, contribute to worsening the nervous system's health. On the other hand, a diet that favors a more balanced intestinal microbiota, such as a vegetarian diet, positively contributes to the maintenance of neurological functions due to its importance in modulating the gut-brain axis. In a meta-analysis study published in 2016, it has also been observed that the consumption of fruits and vegetables is inversely associated with the risk of depression. Vegetarians consume more fruits and vegetables than omnivorous individuals, and also tend to have better health markers and lower risk of other chronic diseases. In view of this, the conflicting results on the relationship between vegetarianism and depression may reflect a lack of standardization with regard to diet quality and adequate intake (or supplementation) of nutrients in some of the studies, as well as the possibility already raised of reverse causality.

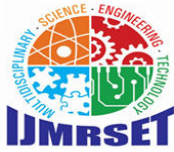
### Influence of the Psychological Domain on the Adoption of a Vegetarian Diet Positive Influence

The main reason individuals decide to adopt a vegetarian diet is because of ethical/moral reasons, which is related to compassion and empathy towards the animals. Since some people feel that eating animal products is wrong, abstaining from their consumption could contribute to a better psychological state. Adopting a vegetarian diet can bring about positive feelings, such as altruism and a sense of purpose, while the pursuit of such guilt-free peace of mind could also positively influence one's choice to adopt a vegetarian diet. A study conducted by Antonetti and Maklan showed that experiencing either guilt or pride could change consumers' behavior and their intention to purchase more sustainable products. Building on that, feeling guilty about eating animal products could lead to a behavioral change, and feeling proud of doing it could reinforce the maintenance of a vegetarian diet.

Moreover, some individuals adopt a vegetarian diet due to spiritual or religious reasons. Spirituality is a concept related to people's quest for the meaning in life and a connection to a higher or sacred power. On the other hand, religiousness is related to the degree in which an individual believes, follows, and practices a religion, which might influence how one chooses to live their lives. An individual who follows a religion that preaches abstention from animal products might feel encouraged to adopt a vegetarian diet. Good adherence to the diet could, in this case, be a positive psychological reinforcement, as it would be in line with their own beliefs. As it has already been demonstrated, high levels of spirituality and religiosity are associated with better social, psychological, and environmental QoL outcomes.

### Negative Influence

Despite the positive outcomes related to the adoption of a vegetarian diet, some challenges can be found. For many, the barriers to adopting vegetarianism outweigh the possible benefits, and may prevent them from taking that step. Studies corroborate the evidence that attachment to the taste of meat constitutes an obstacle to adopting vegetarianism. In addition, other barriers may be considered, such as the fear that a vegetarian diet could be nutritionally inadequate or monotonous, or that it may not favor satiety; the belief that preparing vegetarian meals is harder; difficulties in finding options when eating in restaurants; living with people who eat meat; and a lack of knowledge about meat-free eating. Especially among men, meat is considered a "comfort food", and its intake is associated with strength, muscle building, and masculinity. These beliefs represent a barrier to reducing meat consumption, as demonstrated by a study with soldiers from Norway who evaluated their perception of the



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implementation of the “Meatless Monday” program. The program is a worldwide campaign, adopted in more than 40 countries, which aims to make people aware of the advantages of reducing meat consumption.

All these barriers interconnect with the social domain, as they are influenced by the social context in which an individual is inserted. Nevertheless, the negative psychological effects refer to how individuals react to these fears or barriers, which might negatively affect their choice of adopting a vegetarian diet. As described by Schmittetal, the perception of discrimination, both about an individual and a group, has an impact on well-being, with potential psychological consequences (contributing to mental stress, anxiety, depression) and affecting other aspects, such as self-esteem, humor, and satisfaction with life.

### *Social Domain*

The social domain related to QoL includes personal relationships and social support. In fact, having good social connections is essential for mental health and well-being, positively influencing one’s QoL. In this case, the consequences of adopting a vegetarian diet have to be analyzed based on the social and cultural group in which an individual is inserted, as well as the attitudes of close people towards vegetarianism.

### Influence of Adopting a Vegetarian Diet on the Social Domain Positive Influence

Unlike other dietary patterns, vegetarianism goes beyond the definition of one’s food choices. Rather, it is defined as a social identity, which consists of how a person identifies themselves in terms of the social group in which they believe to belong. A study conducted with young vegan women revealed that not only did they identify with the diet, but they also passionately engaged in a “vegan lifestyle”. The choice of becoming a vegan had positive effects in many different ways, including social relationships, and identification and sense of connection with the vegan subculture. Therefore, the choice of following a vegetarian diet can enhance one’s connection with other people who share the same life philosophy, strengthening social bonds and positively influencing one’s QoL.

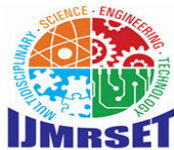
### Negative Influence

Many of those who decide to adopt vegetarianism suffer rejection from others and are victims of stereotyping and discrimination. Such negative attitudes towards vegetarians and vegans are known as “Vega phobia” or “vegan phobia”, a term already spread in the scientific literature. A possible explanation for the discrimination against vegetarians and vegans is related to the cognitive dissonance suffered by individuals who eat meat. In this context, cognitive dissonance refers to the contradiction experienced by individuals who like animals and feel compassion for them, but, at the same time, consume meat. Therefore, individuals who eat meat may discriminate against vegetarians not out of fear or dislike, but because they represent an affirmation that eating meat is not necessary and is, therefore, unjustified.

The negative consequences of a vegetarian identity usually have a stronger impact on vegans than vegetarians because the former suffer more rejection and are viewed more negatively by omnivores. Such discrimination comes not only from nonvegetarian people, but also from the media, as demonstrated by Cole and Morgan in a study that evaluated how veganism was reported in UK newspapers. Such a study concluded that the media tends to present vegans as sentimentalists, fanatics and extremists, in addition to mocking veganism and considering it impossible to maintain in practice.

### Influence of the Social Domain on the Adoption of a Vegetarian Diet Positive Influence

Vegetarians and vegans also showed more adherence to their diet when compared to individuals who follow a paleo, gluten-free, or weight-loss diet. Social identification was an important predictor of adherence in both quantitative and qualitative analyses. According to Crystal vegetarians and vegans described their diet not as an individual choice, but as a manifestation of their social ethics. Ethical and moral concerns were considered the most important facilitators of diet adherence, and a lack of adherence would go against the group’s moral code. Feeling part of a social group can also positively influence how strictly one sticks to a dietary pattern. The sense of belonging and the in-group social reinforcement could make it easier for individuals to maintain their dietary patterns, provided they feel supported by the group.



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Vegetarians that have a close circle of vegetarian contacts (friends, family or coworkers) have been shown to have higher QoL than those who do not. In this case, they can be positively influenced by their social environment. Moreover, just as the social context in which vegetarians are inserted may influence their adherence to the diet, individuals who eat meat may also be influenced by living with vegetarians. In their study, Geerts, Backer, and Erreygers described some characteristics of meat-consuming individuals, with emphasis on the fact that meat consumption is considerably lower among those living with vegetarians in the same household. In addition, discrimination against vegetarians was less common among individuals who had vegetarians in their household or circle of friends. Thus, greater acceptance and lower levels of vegan phobia among meat consumers (resulting from their close contacts with vegetarians) may have a positive influence on other individuals' feeling more comfortable when adopting a vegetarian diet.

### Negative Influence

Cultural aspects are relevant predictors of meat consumption. The consumption of different species of animals varies between cultures. Animals considered suitable for consumption in some countries may not be seen in the same way by individuals of other nationalities. As demonstrated by Ruby, in countries considered individualistic (such as the United States and Canada), a feeling of disgust is the primary attitude of certain individuals when faced with the idea of eating certain animals. On the other hand, in more collectivist nations, such as China and India, cultural norms influence individual emotions and the sense of morality, being the greatest predictor for not consuming meat.

Such gender differences may influence the adoption of vegetarianism depending on the sociocultural context in which an individual is inserted. A study by Rubye Tal with participants from Argentina, Brazil, the United States, and France (countries that are among the largest consumers of beef in the world) revealed that men consume beef more frequently and enjoy the taste of it more, while women show more negative attitudes towards the consumption of red meat, such as disgust. The same study also demonstrated that there are cultural differences related to the acceptance of vegetarianism. American women showed greater admiration for vegetarianism, while French women were the ones who admired vegetarians the least. Participants from Brazil and Argentina, considering the entire sample, demonstrated more positive attitudes toward beef consumption, followed by participants from France and, finally, from the United States.

### Environmental Domain

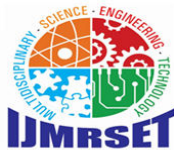
The environment in which an individual is inserted also exerts an important influence on their QoL. Living in a safe and healthy environment, with proper social care and an efficient transport system, opportunities for acquiring new information and skills, as well as recreation/leisure areas, are all relevant factors. Moreover, having good financial resources can positively contribute to a good QoL. On the other hand, factors that have a negative impact on the environment, such as pollution and climate change, could also negatively affect one's QoL.

### Influence of Adopting a Vegetarian Diet on the Environmental Domain Positive Influence

Following a more sustainable diet, which will contribute to a healthier environment, could positively influence QoL. In general, plant-based diets are more sustainable than those based on animal foods, as they require fewer natural resources for food production and have a lower impact on the environment. An omnivorous diet is estimated to require 2.9 times more water, 2.5 times more energy, 13 times more fertilizers, and 1.4 times more pesticides than a vegetarian diet. In addition, meat and dairy production contribute 80 percent of all gas emissions from food production, and 24 percent of total greenhouse gases coming from food. Livestock production uses about 70 percent of all agricultural land globally, and consumes 29 percent of all water spent on agriculture.

According to Aleksandrowicz, the change from a typical Western diet to more sustainable food patterns could reduce greenhouse gas emissions and land use related to food production by up to 80 percent, in addition to a 50 percent reduction in water use. In that study, all diets involved reducing or replacing animal foods with others of plant origin (such as, for example, vegetarian, vegan, Mediterranean and pescatarian diets), in addition to replacing the consumption of ruminant animals with monogastric animals. Similar results were observed in a study by Rosietal. In Italy, which showed that vegetarian diets (ovolactovegetarian and vegan) had a lower ecological footprint in the three aspects assessed: CO<sub>2</sub> production, water consumption, and land use. Corroborating these data, a global analysis of different dietary strategies to reduce the environmental impact and improve health estimated





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that, in developed countries, the replacement of animal foods with plant-origin foods could reduce the number of premature deaths by up to 12 percent, and greenhouse gas emissions by up to 84 percent.

### Influence of the Environmental Domain on the Adoption of a Vegetarian Diet Positive Influence

Environmental issues are part of the motivations that lead individuals to reduce meat consumption or adopt a vegetarian diet. The concept of sustainability applied to food refers to a diet that, in addition to being nutritionally adequate and healthy, respects biodiversity and ecosystems, is accessible, culturally accepted, and contributes to preserving natural resources.

A motivation to live in a healthier and more sustainable environment may positively influence people to adopt and maintain a vegetarian diet, as it has already been proved that a more plant-based diet has a lower environmental impact when compared to animal-based diets. Individuals who are naturally engaged in sustainability and environmental issues are more likely to have positive feelings related to a sense of altruism achieved from adopting a vegetarian diet. The possibility of protecting their own environment and contributing to a better world can bring a sense of purpose in life, which could positively influence diet adherence and QoL.

### Negative Influence

Adopting a vegetarian diet may depend on other factors beyond an individual's will. Economic aspects, both at the global level (economic situation of the country) and the individual level (income and social status), could influence food choices. In general, the lower the income, the greater its influence on food. People with higher income suffer less from fluctuations in food prices and are more demanding in their choices. Likewise, in poorer countries, the consumption of certain foods is highly influenced by their prices, which does not occur with the same intensity in developed countries. The influence of economic aspects on the nutritional quality of a diet is quite variable. For example, it has been shown that increased income leads to a higher intake of fruit. However, the same increase might lead to eating out more often, or consuming more processed foods, in addition to eating more meat and fewer legumes. Moreover, a cross-sectional study carried out in the United States showed that lower income levels were associated with poorer quality of food—in particular, lower consumption of fruits and vegetables and higher consumption of sugary drinks and frozen desserts<sup>4</sup>.

## IV. VEGETARIANS' QUALITY OF LIFE

A vegetarian diet's effect on QoL was assessed in a cross-sectional study carried out with runners. A convenience sample was selected from German-speaking countries, namely Germany, Switzerland and Austria, and a total of 281 individuals (158 vegetarians and 123 omnivores) participated in the study. The instrument used to assess QoL was the WHOQOL-BREF, which was applied virtually to the study subjects. The results showed that all participants scored high on QoL, regardless of the type of diet adopted, with no difference between groups. Therefore, it was concluded that runners have high levels of QoL, and that a vegetarian diet was as good as an omnivorous diet for this population segment.

Just as some individuals might feel motivated to follow a vegetarian diet for a number of different reasons, others might feel discouraged due to psychological, social, or environmental factors. A fear of being stigmatized or excluded from their social group could hinder one's intention of becoming a vegetarian. Moreover, cultural aspects that enhance meat consumption could have the same effect, together with the connection that people make between meat and masculinity. Finally, since the adoption of an alternative dietary pattern also relies on environmental factors, such as food availability and economics, individuals may face difficulties when adopting a vegetarian diet if they lack a good supply of plant-based food options.

## V. CONCLUSIONS

In conclusion, vegetarianism can either influence or be influenced by different QoL domains. The choice of adopting a vegetarian diet can have positive consequences, such as better physical health, positive feelings related to the adoption of a morally correct attitude, an increased sense of belonging (to a vegetarian community) and lower environmental impact. On the other hand, factors that go beyond an individual's control, such as the environment and social/cultural



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group in which they are inserted, as well as gender-based differences, economic aspects, and limited access to a wide variety of plant-based foods, can negatively impact the QoL of those choosing to abstain from meats or other animal products. Despite the low number of studies on vegetarianism and quality of life, the existing evidence points toward a more positive impact. It is important to understand all the effects of adopting a vegetarian diet—beyond its nutritional aspects. Not only do studies in this area provide more consistent data, but they may also contribute to mitigating all factors that might prevent individuals from adopting a vegetarian diet, or that may have a negative impact on the quality of life of those who already follow it. Further studies are necessary to understand how strongly these connections between QoL domains and vegetarianism can influence the individuals who adopt this dietary pattern.

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