

Major Research Project on
A Study on Sustainability of Vegan Diet

Submitted By:

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2K20/DMBA/136

Under The Guidance of

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CERTIFICATE

This is to certify that the Project titled - “A Study on Sustainability of Vegan Diet” is an academic work done by - “Tanvi Gulati” submitted in the partial fulfilment of the requirement for the award of the Degree of Masters of Business Administration from Delhi School of Management, Delhi Technological University, Bhawana Road, Delhi-42. It has been completed under the guidance of “Mr. Yashdeep Singh”. The authenticity of the project work will be examined by the viva examiner which includes data verification, checking duplicity of information etc. and it may be rejected due to nonfulfillment of quality standards set by the Institute.

STUDENT DECLARATION

This is to certify that I have completed the Project titled “A Study on Sustainability of Vegan Diet” under the guidance of “Mr. Yashdeep Singh” in partial fulfilment of the requirement for the award of degree of Masters of Business Administration at Delhi School of Management, Delhi Technological University, Bhawana Road, Delhi-42. This is an original piece of work and has not been submitted elsewhere.

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ACKNOWLEDGEMENT

At this ecstatic time of presenting project report on “A Study on Sustainability of Vegan Diet”, I would like to express my deep gratitude to Mr. Yashdeep Singh (Professor, DSM, DTU) for believing in my potential and ideas to carry out the study as well as encouraging and guiding me throughout.

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EXECUTIVE SUMMARY

This project was undertaken to study the different types of perspectives available in the form of published articles on web for the purpose of understanding the consumer behaviour towards sustainability of vegan diet.

In this project various thoughts towards the sustainable aspect of vegan diets have been studied which were based on the factors such as cost, nutrition, psychology, personal experiences, weight, diet, ultra-processing food, local, environmental, culture etc.

The research methodology used in this project exploratory research for which qualitative data was collected from various secondary resources in the form of websites including Quora, The Guardian etc., and thematic analysis using Voyant Tool was done to analyse the data.

At last, it was concluded that there are many types of diets available in the market including vegan for which many products have become accessible in the markets throughout the globe. The study suggested that eating local and fresh food will lead to a sustainable and healthy existence.

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1. INTRODUCTION

1.1 Background

Chronic diseases have increased dramatically worldwide in recent decades. Obesity, diabetes, heart disease, respiratory disease, and malignant tumours account for 63 percent of global total mortality each year. Furthermore, chronic diseases account for nearly 45.9% of all disorders globally (Szakály, Z., 2017). People's wellbeing has worsened in recent decades, a phenomenon that can be connected to an unhealthy living, poor nourishment, and excessive consumption of discretionary foods and drinks (Rigó, J., 2007). According to (Tóth, G., 2004) humans take more than one and a half tonnes of food per capita throughout the course of their lifetime, the content of which is particularly important because diet is responsible for 40–60 percent of diseases. Hungarians invest 23.1 percent of their earnings on meals, alcoholic drinks, and tobacco, which is a large chunk of their earnings (Eurostat, 2018). As a result, the make-up of our everyday food does create an impact. Corresponding to the fast spread of chronic illnesses, the population of developed nations is ageing, resulting in an increase in the number of people who are inactive and require medical treatment. Furthermore, average age of onset is rising, and this, together with the ageing of the population, will place an ever-increasing strain on healthcare systems in the future. As a basic norm, the longer individuals' lives, the costlier their medical treatment becomes, which can be ascribed to a variety of factors, including increased levels of immobility and stressed living (Szakály, Z., 2017; World Health Statistics, 2014). The element of health plays a significant role amongst the many aspects of conservation (social, ecological, and economic) (Mertens, E., et. al., 2016). According to (Tilman, D.; Clark, M., 2014), healthy nutrition choices, ecological sustainability, and people's health are all interconnected aspects. Managing them is a worldwide concern that is of critical importance to the ecosystem and public wellbeing. The aforementioned issues have clearly presented new problems to the food sector. It is now vital to establish dietary habits and produce foods that can halt the spread of chronic diseases plaguing humanity and lay the groundwork for a prolonged healthy life expectancy for the older population due to their good health effects (Szakály, Z., 2017). As a result, the bulk of society places a high value on health. In most situations, customers make a link among adopting a healthier living and altering their eating habits. As per Fürediné Kovács (Fürediné Kovács, A., 2007), there are 3 possible pathways to a healthier dietary

transition. On the one hand, a balanced lifestyle might be viewed as a means of curing diseases, but on the other hand, a newer sort of health awareness is emerging that promotes well and emphasises on health-promoting activities. Between the two ways outlined above, there is another framework that aims on customer behaviour aimed at lowering and minimising hazards. When a customer takes this strategy, they choose meals that will help them avoid some undesirable wellness outcomes.

A shift in nutritional science has occurred, defined by malnutrition-related disorders (bulimia and anorexia), sociocultural embeddedness, and an intra-active view of humans (nutrition as part of a way of life). As a result, diet can be regarded as an important aspect of health science's functional toolkit as a preventative and restorative technique. Veganism (a plant-based diet) is rooted in human individuals' interpersonal and inter perspective, emphasising a mindful standard of living and customer health awareness (Kökény, T., 2005; Kulcsár, Z., 2002). "Plant-based or plant-forward eating patterns focus on foods predominantly from plants," says (McManus, K.D., 2018), a Harvard Medical School contributor. This encompasses nuts, seeds, oils, whole grains, legumes, and beans, in addition to fruits and veggies. This does not imply that you are a vegetarian or vegan who just doesn't consume meat or dairy products. Rather, you are choosing a greater share of your foods from plant sources." The plant-based diet can be employed at any point of time of a person's specific life cycle (Melina, V., et. al., 2016), which should be provided to the explanation above. Many subgroups of vegetarian (plant-based eaters) can be identified. Vegans do not eat any animal-derived goods. Thus, they resist include them in their diet. Lacto-vegetarians, on the other hand, ingest milk and dairy products. Semi-vegetarians eat mostly a plant-based diet that may be supplemented with poultry and fish in moderation. Flexitarians are similar to the previously stated subgroup in that they consume largely fruits and vegetables but do not have to avoid meat and fish. Pesco-vegetarians are considered one of the most lenient consumers of a vegan food, as they consume milk, milk-based goods, eggs, and fish in addition to plant-based elements (Rigó, J., 2007; Ádány, R., 2011; Kökény, T., 2009). Plant-based diets have been around for hundreds of years. "Pythagoras", "Plato", "George Bernard Shaw", "Mahatma Gandhi", "Albert Einstein", "Leonardo da Vinci", and "Leo Tolstoy" were among those who followed such a diet (Leitzmann, C., 2014). Moreover, these diets have become increasingly popular. These food preferences, on the other hand, cannot be regarded fad diets because the most of of them are supported by science based factual information. As a result, the "plant-based diet" is a dietary movement in which animal-derived goods including eggs, animal meat, meat-based products, milk and milk-based products, as well as "highly

processed" foods like refined oils, refined sugar, and wheat flour, are relegated to the background. Cereal grains, potatoes, lentils, greens, plus fruit make up the majority of these diets, which are mostly raw, uncooked, or barely cooked fruits and vegetables. It is crucial to note that this sort of diet cannot be considered uniform or standardised, because the people typically choose their own nutritional trend, potentially after consulting a professional (usually a dietician). Individuals might switch to a vegan diet for a variety of reasons, including animal welfare, political, economic, ethical, ecological, and spiritual grounds, or because their current diet is unhealthy. Vegan diet is becoming increasingly important in dietary research and other areas of medicine that deal with nutrition (Leitzmann, C., 2014; Leitzmann, C., 2003; Macdiarmid, J., et. al., 2012, Marlow, H.J., et. al., 2009, Steinfeld, H., et. al., 2006; Szabó, Z., et. al., 2016). Priority is given to anticipated medical benefits amongst vegetarian mindsets (intentions). Plant-based eaters do not believe meat to be a vital and essential element of their everyday nutrient intake. Some people prefer to limit the amount of animal products they consume rather than eliminating them entirely from their diet (Kökény, T., 2005; Szabó, Z., et. al., 2016; Lea, E., et. al., 2003). Considering numerous forms of vegan diets are separated a priori by the professionals and may differ in between countries, determining the specific number of customers who adopt a vegetarian diet is notably complex. Furthermore, there are no standardised surveying methodologies that are accurate throughout nations and that can distinguish between vegetarians and the wider public. Due to the various methods study reports employed, the percentage of people choosing a vegan diet might indeed be larger than the factual reality. The following are few important trends focused on statistics and research presented by vegetarian organisations in various nations. India has the maximum ratio of vegetarians, with 30–40% of the country are following a vegetarian eating habit (Oláh, A., et. al., 1985; Shridhar, et al., 2014). The ratio of vegetarians in Europe is higher in Italy, the United Kingdom, and Germany (9%), although it is lowest in the Netherlands (4%) (Leitzmann, C., 2014). It's also essential mentioning Austria and Switzerland, where the vegetarian population is 3–3% (Leitzmann, C., 2014; Schüpbach, Wegmüller, Berguerand, Bui, & Herter-Aeberli, 2017). (Cramer, et al., 2017) conducted a nationwide relevant survey for the same. These individuals were usually between the ages of 30 and 65, female, college educated, chronically ill, and physically active. They had a lower likelihood of being in a relationship. Only 6% of them sought medical help for their health complications (being overweight or obese has been the concern mostly stated). Twenty-six percent began following the particular diet as a result of a certain health issue (Cramer, et al., 2017). Researchers believe that there are about 150,000

vegetarians in Hungary, or about 1.5 percent of the country (no statistical investigation has been conducted in the region as mentioned by the researchers) (Kökény, T., 2009). As per "Ahimsza Hungarian Vegetarian Association", ovo-lacto vegetarians account for 43% of Hungarian vegetarians, lacto vegetarians for 46%, and people following plant-based, for 11% (Kökény, T., 2009). As per a report by UN also states that the global census of vegan diet consumers stands at 79 million and specifically in India at around 5 million (Meyer, M., 2021). It can also be stated that by 2050, the population of the planet will rise to 9.8 billion individuals, and per the UN (2017). This represents a nearly 30% growth over the existing estimate of 7 billion people (Scarborough, et al., 2014). Changing demographics and community expansion mean that demand for livestock goods, especially meat, milk items, and harvests, is increasing, which producers must meet (Scarborough, et al., 2014). Dairy and meat output are predicted to grow by 58 and 73 percent, respectively, by 2050 (Gerber, et al., 2013). Issues regarding animal conservation have existed for generations, but changing climate and carbon emissions have only lately gained traction (Weber & Matthews, 2008). Modern food practices, particularly agricultural production, have a very unsustainable environmental effect. The use of ecological assets (land, water, and fossil energy) to breed animals and grow crops contributes to deterioration of the ecosystem. Agricultural production's greenhouse emissions are accountable for around 12 percent of the whole planet's emissions. As we are approaching 2030, it is said that the emission of greenhouse gases might increase by 150 percentage than what we are experiencing today (Friel, et al., 2009). As a result, discovering strategies to reduce the detrimental effects of climate disruption and the ecological imprint of the present food chain has become increasingly important. A viable diet is one that is high in nutrients, safe, wholesome, socially appropriate, and cost effective, with minimal impact on the climate. It also protects and respects diversity and habitats (Aleksandrowicz, Green, Joy, Smith, & Haines, 2016; Pimentel & Pimentel, 2003).

This research concentrates on vegan diet (i.e., diet that does not comprise any animal-derived components) and the reasons why people choose to eat vegan cuisine. This is a crucial matter in the light of our planet's ecological challenges, such as planetary heating and climatic changes in general. Vegan diet is considered to be a more ethical choice to food generated by modern farming (i.e., meat and dairy products), and growing vegan food intake can assist alleviate these primary difficulties (3). Veganism is becoming increasingly acceptable amongst general public (Clarys, et al., 2014; Castañé & Antón, 2017; Dinu, Abbate, Gensini, Casini, & Sofi, 2016; Rosenfeld & Burrow, 2017). In terms of environmental concerns, the

vegan diet has a distinct benefit over an omnivore one. On aggregate, plant - based food has a substantially higher carbon, water, and environmental impact. Cattle farming now occupies around 70% of the planet's agricultural area, contributing to species extinction and soil depletion. As per international standards, vegan diet should be substituted with a vegan diet that promotes fruits, veggies, beans, and grains to increase sustainable development (Rosi, et al., 2017). According to a research, people move to vegan eating for a number of causes, including moral considerations, degradation of the environment, religious views, cultural challenges, wellness concerns, and even distaste for meat (Dinu, Abbate, Gensini, Casini, & Sofi, 2016; Rosenfeld & Burrow, 2017; Marrone, et al., 2021). The top three drivers which lead people to shift towards a plant-based diet are; reasons which relate to animals (89.7%), environment related concerns (46.8%), also, welfare goals (69.3%) (Janssen, Busch, Rödiger, & Hamm, 2016). In comparison to the omnivore diet, research has shown that the plant-based diet offers the highest nutritive value of all diets (according to "HEI-2010, (Healthy Eating Index)" & "MDS, (Mediterranean Diet Scores"). Diets which are based on plants like vegan, have also achieved popularity with a sense of understanding to prolong excellent health by dropping cholesterol and blood pressure, and also lessening the risks of severe illness (such as "cardiovascular disease", "type 2 diabetes", and "cancer") and death rates (Dinu, Abbate, Gensini, Casini, & Sofi, 2016; Radnitz, Beezhold, & DiMatteo, 2015; Marrone, et al., 2021; Beezhold, Radnitz, McGrath, & Feldman, 2018, Sakkas, et al., 2020). Vegan diets that are correctly structured could be nutritiously balanced, healthy, and provide health advantages in terms of illness prevention & cure (Marrone, et al., 2021; Wirnitzer, 2020).

The project aims to understand the long-term sustainability of vegan diet, being followed worldwide. This study will be able to impart a better knowledge of the themes surrounding sustainable diet by addressing this concern. Rather than using standard methods like carrying out interviews or surveying of different customers, gathering and analysing the data of experts' perspectives by monitoring articles and blogs was used. Later, using Voyant Tool, the data was analysed and themes were discovered.

The following is the outline of the paper. A review of the available literature on the subject has been first presented, followed by the methods used to obtain and interpret the relevant information. The study's conclusion, as well as observations on the study 's results for further additions on the work, are included in the upcoming sections.

1.2 Problem Statement

The vegan diet has nowadays become a trend to be followed by people for various reasons, which can vary from person to person. But “is the vegan diet being followed, sustainable”, is the question this paper is trying to explain.

1.3 Objective

- ❖ The study's primary goal is to understand if there was a shift in consumer behaviour with regards to the hype created towards vegan diet being followed by many.
- ❖ Identification of the various factors contributing to the topic is another objective to be obtained from the study.

1.4 Scope

The project might support the consumers to understand the right attitude towards the various types of food available in the market, as well as cultural and psychological factors attached to the food we eat.

2. LITERATURE REVIEW

A vegan diet might help decrease excess fat and consequently overweight (NONCÉS, 2003; Cummings, Parham, & Strain, 2002; Fehř et. al., 2020). It's worth noting that while a lower total body weight may result in a lesser overall body composition, the level of obesity is not certainly reduced. According to research by (Berkow & Barnard, 2006), who examined the body weight of people who do not eat animal-based food & who eat animal-based food, it was found that the men who do not eat animal-based food weighed 4.6–12.6 kgs lesser & similarly women who weighed 2.9–10.6 kgs lesser than their counterparts who were animal meat eaters, according to statistics. Hence, heart - related illnesses, which are primarily caused by obesity or conditions related to being overweight, can be minimized by adhering to a well-planned diet (Szabó, et al., 2016; Friedewald, Boden, Stone, Yancy, & Roberts, 2011; Fehř et. al., 2020). Vegetarian food also has a lower saturated fat consumption, which is a significant health advantage (Kökény, T., 2009; 21; Lea, E., et. al., 2006; Fehř et. al., 2020). Experts used human experiments to show that people who ate food which was based on plants and plant products had higher “serum albumin” concentrations & had a better integrated nutritional level than people who ate a diverse diet (Benzie, I.F., et. al., 2009; Fehř et. al., 2020). Individuals who eat vegan food have greater levels of vital nutrient content like “magnesium, potassium, folic acid, fibre, antioxidants like vitamins C and E, and phytochemicals”. Vitamins could help with iron intake from plants if there are enough of them (NONCÉS, 2003); Dwyer, J.T., 1988; Pomerleau, J., et. al., 2002; Fehř et. al., 2020). Plant-based foods have the potential to reduce warning signs associated with disease progression, which must be regarded a major health benefit (Weinrich, R., 2019; Fehř et. al., 2020). Cardiovascular disease deaths have decreased, as has the occurrence of "type 2 diabetes, dementia, gallstones, kidney disease, rheumatoid arthritis, and numerous allergies" {12; Lea, E., et. al., 2003; Dwyer, J.T., 1988; Fehř et. al., 2020). In light of the above, certain nutritional recommendations highlight the potential impact of consuming red meat & meat which is highly processed, in the development of cardiovascular diseases. Furthermore, an increased frequency of academic investigations has revealed that the sole concern element that may be regarded is higher intake of meat eating (Leroy, F., et. al., 2019; Micha, R., et. al., 2010; O'Connor, L.E., et. al., 2017; Fehř et. al., 2020). Nonetheless, the general negative attitude toward meat intake aids individuals who prefer plant-based diets, which is deemed better (Leroy, F., et. al., 2019; Micha, R., et. al., 2010; O'Connor, L.E., et. al., 2017; Fehř et. al., 2020}. Most vegans have cholesterol and blood pressure levels that are near

the bottom of the usual BP levels (Lea, E., et. al., 2003; Lea, E., et. al., 2002; Lea, E., et. al., 2006; Graça, J., et. al., 2015; Dwyer, J.T., 1988; Barnard, N.D., et. al, 2009; Berkow, S.E., 2005; Knutsen, S.F., 1994; FehÅ©r et. al., 2020). Reduced meat intake and an inclination for vegan food can help to reduce the risk of getting some (but not all) kinds of cancer. Red meat is "probably carcinogenic to people," as per the "International Agency for Research on Cancer (IARC)", whereas processed meat items are "carcinogenic to humans" {20; IARC, 2015; Nechuta, S.J., et. al., 2012; Pérez-Cueto, F.J., et. al., 2012; Richman, E.L., et.al., 2010; FehÅ©r et. al., 2020). Research says that vegan food leads to better efficient resource extraction, which might also lessen ecological effects {50; Weinrich, R., 2019; Candy, S., et. al., 2019; Sabaté, J., 2001; FehÅ©r et. al., 2020). Whenever it concerns to ecosystem protection, experts focus on reducing the effects of climate change and pollution (Kökény, T., 2009; 15; Schenk, P., et. al., 2018; Candy, S., et. al., 2019; Mylan, J., 2018; FehÅ©r et. al., 2020). An increasing number of studies have shown that increased meat manufacturing and intake, and also industrialized agricultural techniques, create an unfair burden upon the ecosystem (Mullee, A., et. al., 2017; Könczey, R., et. al., 1997; Vanhonacker, F., et. al., 2013; FehÅ©r et. al., 2020). For all metrics, drivers of ecological effects are said to be significantly advantageous in the vegan diet than in the Mediterranean diet (which includes fish & products which are based on meat) (Castané, S., et. al., 2017; FehÅ©r et. al., 2020). In Denmark, life-cycle assessments (LCAs) have been used to evaluate typical meals to plant-based meals, basing on components that have an effect on the ecosystem. The results of the plant-based diets are significantly better than the mixed diets. There have been no significant changes amongst the plant-based diets, moreover (Goldstein, B., et. al., 2016; FehÅ©r et. al., 2020). The preservation of life is very important, which means that animals as individuals and as species must be prioritised (Schenk, P., et. al., 2018; Weinrich, R., 2019; FehÅ©r et. al., 2020). People are hesitant in supporting the development of industrial farming circumstances that abuse and eventually kill animals, in necessary to defend animals for moral grounds ("the ahimsa principle") (PADADC, 2003; Kenyon, P.M., et. al., 1998; FehÅ©r et. al., 2020). The researchers, (Backer, C.J.S., et. al., 2015) examined the connections among both human and animal well-being perspectives and donating readiness, as well as connections between ethical issues and diet choices among meat eaters, flexitarians, and vegetarians (FehÅ©r et. al., 2020). The willingness of the respondents to donate to charitable organisations that seek to preserve animals and humans was used to measure their giving behaviour. According to their findings, vegetarians were more willing to contribute to animal's rights organisations as compared to persons who ate a combined diet.

A vegan customer segment was uncovered during one of the investigations, and they might be open to the manufacturing of animal-derived goods if animal welfare is considered (Janssen, M., et.al., 2016; Fehřr et. al., 2020). According to surveys, the most significant barriers to switching to vegan food are the satisfaction of consuming meat and the enormous difficulties in giving it up {21; Lea, E., et. al., 2006; Graça, J., et. al., 2015; Lea, E. et. al., 2001; Fehřr et. al., 2020}. Factors related to health and convenience have been proven to be less significant than the acceptability of consuming meat (Lea, E.; Worsley, A, 2003; Lea, E., et. al., 2006; Lea, E., et. al., 2006; Pohjolainen, P., et. al., 2015; Graça, J., et. al., 2015; Lea, E. et. al., 2001; Fehřr et. al., 2020). Vegan detractors commonly claim that such diets are protein-deficient. It's important to mention that there are differing viewpoints with regards to protein content of vegan diets. Studies suggest that there is no significant difference in protein supply among diets which are based on plants & diets which are based on animals, found after numerous trials (12, Thomas, D.T., et. al., 2016; Fehřr et. al., 2020). Nonetheless, there are numerous methods present today to address this problem. Many vegan protein-rich food products are available, including "soy products, tofu, seitan, and tempeh" (Kökény, T., 2009; 20; Lea, E., et. al., 2006; Dwyer, J.T., 1988; Lea, E. et. al., 2001; Fehřr et. al., 2020). Micronutrient imbalances can readily occur in vegetarians due to a lack of, "vitamin B12 and vitamin D, as well as riboflavin, iron, calcium, and zinc consumption" (Candy, S., et. al., 2019; Fehřr et. al., 2020). Vitamin B12 is essential because it can only be absorbed via, "water-soluble meals, mostly from animals (e.g., liver, meat, milk and dairy products, and eggs)" (Kökény, T., 2009; Dwyer, J.T., 1988; Balk, E., 2005; Fehřr et. al., 2020). However, according to the findings of a 2014 study, "nori sheet made of dried seaweed", that are widely consumed in Japan, may be an important source of vitamin B12. Many similar foods or nutritional supplements may also be beneficial (Szabó, et al., 2016; Watanabe, F., 2007; Fehřr et. al., 2020).

3. RESEARCH METHODOLOGY

The project has been based on exploratory research and qualitative data for the same was collected from various secondary sources, including Google Scholar, The Guardian, BBC, Quora, Telegraph etc.

Thematic analysis was the method used to analyse the contextual data of this project. The inductive approach was used to determine the themes which were being reflected after the thorough study of all the blogs, articles and the research papers. Therefore, semantic approach was used to study the data.

4. DATA COLLECTION & ANALYSIS

4.1. Data Collection

The sources for collecting data were secondary. Data was collected in the form of blogs or articles from various websites which were, Quora, The Guardian, The Hindu, Times of India, BBC, Harvard Politics, Telegraph, Food Unfolded, Tree Hugger, Daily Titan, BBC Good Food, Business Insider, Her Circle, Oxford Study, WebMD, Food Ethics Council etc. these blogs included various perspectives with regards to why plant based diet should be followed, what are its impacts on the environment at large, whether the alternatives which people throughout the world have started adopting are truly sustainable or are there any points which are hidden from the public.

Process of collecting data was as follows:

Firstly, keywords or phrases were typed on the search engines or search bars of the social media handles, like:

- ❖ “Is vegan processed food healthy”
- ❖ “Is vegan considered sustainable”
- ❖ “Are people moving away from veganism”
- ❖ “Are people against vegan”
- ❖ “Change of perspective of consumers towards vegan food”
- ❖ “Is plant-based diet sustainable”
- ❖ “Is plant-based diet economical”
- ❖ “How sustainable is cooking plant-based diet”
- ❖ “Negative effects of plant-based diet”

Step two included finding the right set of data in the form of blogs, articles and research papers. Later, all the relevant data found which included 23 articles and blogs were compiled in the word document.

Table 4.1: Blog Titles & Publications

Blog Number	Blog Title	Publication
Blog 1	Rujuta & Alia burst popular food myths	Times of India
Blog 2	Every diet comes like a cult, says Rujuta Dwekar	The Hindu
Blog 3	Is Veganism Sustainable? Vegan Diet Environmental Effects	American Ostrich Farms
Blog 4	Why the vegan diet is not always green?	BBC
Blog 5	Why Veganism isn't an environmentally friendly as you might think.	Independent
Blog 6	Vegan shouldn't be the last word in sustainability	Harvard Politics
Blog 7	Why vegan food isn't as sustainable – or healthy – as you think	The Telegraph
Blog 8	Veganism isn't necessarily the most ethical or sustainable option	The Pittnews
Blog 9	Don't eat vegan, eat sustainable	Food Unfolded
Blog 10	Is the vegan diet as sustainable as promised?	Times of India
Blog 11	A vegan diet is not automatically the most sustainable choice	Treehugger
Blog 12	Benefits of a vegan diet don't outweigh its environmental impact	Daily Titan
Blog 13	5 least sustainable vegan (plant-based) foods	Impact Ninja
Blog 14	Is vegan diet better for the environment?	BBC Good Food
Blog 15	How a vegan diet could affect your intelligence	BBC
Blog 16	How veganism may one day become sustainable	Business Insider
Blog 17	Vegetarianism: Should we rethink its role in sustainability?	SDG Knowledge Hub

The steps involved in analysing the data were; familiarization, where the overview of the collected data was done before starting with the analysis part. Later, the themes were identified and reviewed. Thereafter, the results in the form of evidences for each theme from the data have been provided.

Table 4.2: Frequency of Contextual Themes

Terms	Frequency	Total
Meat, Meats, Livestock, Animal, Animals	= 206+12+32+81+48	379
Diet, Diets, Dietary, Dieting	=223+101+24+5	353
Health, Healthy, Healthier, Diseases	=144+72+9+9	234
Environmental, Environmentally, Environment	=97+18+73	188
Milk, Milks, Dairy	=67+7+76	150
Emission, Emissions, Emitted, Emits, Emit, Releases, Release, Released, Footprint, Footprints	= 65+1+5+3+8+6+4+43+5	140
Plant, Plants	=135+20	155
Local, Locally, Localized, Regional, Native, Region's, Region, Indian	=50+14+2+9+7+3+3+11	99
Protein, Proteins	= 66+16	82
Production, Manufacturing	= 58+2	60
Cost, costs, costed, costly, expensive	= 19+6+1+1+9	36
Waste, Wasting, Wastage, Wasted, Wastes	= 21+2+1+1+1	26
Processed Food	=11	11

Source: Voyant Tool

- ❖ Diet & Cost: Following a plant-based diet will lead to the increment of the expenditure on the food as per the learnings from the collected data.
- ❖ Environment & Local: The effect of eating from local markets can reduce the greenhouse effects of food produce on the environment because the transportation carbon footprint is cut down and the pesticides and herbicides used for preserving plants to travel long distances is reduced.
- ❖ Cost & Health: In contrast with the consumption of vegan food it was understood that for following a vegan diet one is required to spend more than regular, which is possible only for individuals with high income.
- ❖ Environment & Health: Health has a connection with environmental changes. The bad effects of greenhouse gases on environment in the form of pollution of resources will impact the health too.
- ❖ Diet & Meat: There are different kinds of diets being followed throughout the world, plant-based diet is one of them which aims at cutting down the consumption of meat products.
- ❖ Wastage & Meat: The connection between reducing the consumption of meat and the wastage of food was understood in a way that only basing our diet on plants can lead to wastage of food as there are foods which are highly perishable in nature. This can put a lot of pressure on the farmers as their efforts will be put down the drain each time when the harvest will not be consumed wholly, but there are studies going on with regards to how the food waste can be used, for example, in creating eco-friendly packaging or using the waste as a compost for growing other food like mushroom.
- ❖ Meat & Processed Food: They both have a direct connection with each other as with the reduction of meat consumption due to the rise of plant eaters lead to the emergence of meat alternatives which are plant based but are highly processed in order to provide the same texture and taste of the meat.
- ❖ Processed Food & Cost: The cost involved in consuming vegan but highly processed food was evident while analysing the collected data.
- ❖ Local & Diet: Eating a localized food for fulfilling our nutrient requirement would be more sustainable with regards to the various factors like preserving the culture and creating less impact on the environment.

5. FINDINGS & DISCUSSIONS

The findings of the study include the various perspectives in the form of evidences with regards to the identified themes, which are as follows;

Processed Food

- ❖ We should also consider the environmental impact of meat substitutes (which are heavily processed). Goot goes on to add that problems in the "water" and "energy" procedures which are needed to create livestock substitutes restrict the ecological benefits they want to achieve (Blog 3).
- ❖ Customer opinions about processed foods are frequently divisive, and inappropriate marketing regarding packaged food is a problem when it is not founded on accurate understanding of production processes that can preserve food taste and quality whilst still assuring sustainability. There are various degrees of sustainability and quality when it relates to meat production (Schmidt & Mouritsen, 2020).
- ❖ People who eat meat frequently argue that vegan alternatives taste bad and are overly processed (Blog 7).
- ❖ Even though majority of vegan meat is classified as "Ultra Processed Food", Prof Kuhnle claims that this is a "red herring" and therefore human beings should rather concentrate on nutrient content. "The processes don't sound appetising, but then neither are slaughterhouses," as have been quoted (Blog 7).
- ❖ Plant-based substitutes to meat, such as "Beyond or Impossible Burgers", are nevertheless "highly processed" (Blog 6).

Meat

- ❖ "My general recommendations are to limit meat intake and, if possible, pay attention to how foods are grown and delivered," says Martin Heller, a sustainable researcher at the "University of Michigan" who led the research (Blog 4).
- ❖ There are strong claims that excessive animal husbandry is harmful for the environment and that we need to eat fewer animal made products to counteract climate change. In 2019, the "International Panel on Climate Change (IPCC)" released special research on global warming that contained a policy recommendation to reduce meat consumption (Blog 7).

- ❖ Lowering milk and meat intake is frequently recommended as among the most effective strategies for people to minimise their co2 emissions. And there's a lot of logic in this statement. Currently, the worldwide meat and milk sectors have a significant environmental impact (Blog 11).
- ❖ Oversimplifying some extremely complicated issues by limiting environmental discussions to a "vegan = good, meat-eating = bad" approach. As things stand, lowering meat consumption in general is a critical piece of the puzzle; but, completely cutting flesh from our meals implies leaving no opportunity for responsible production of meat to thrive. Where responsibly raised meat produced using environmentally favorable practises is accessible, as it is in my location, and other regional proteins such as lentils and nuts are scarce, it might be a better sustainable choice than depending on some other sources of proteins and foods (Blog 11).

Protein

- ❖ Alia asked a critical question concerning protein sources for vegetarians. "In our Indian culture, protein is found in every dish. "Even something as basic as dahi chawal provides protein," Rujuta explains. As a result, it's safe to conclude that a vegetarian's protein needs can be met with a variety of vegetables and grains (Blog 1).
- ❖ Proteins derived from animals is much cheaper per kilogramme. As per Archer, it's more humanistic, moral, and ecologically responsible food choice (Blog 12).

Diet

- ❖ As people's incomes & urbanisation increase, they consume additional animal-source food, sugar, fats and oils, processed grains, and overly processed foods. Obese is on the rise, as are diet-related disorders including heart related diseases and diabetes (Blog 2).
- ❖ Many of us have begun eating dairy-free due to the variety of diets available. Rujuta cited two explanations why milk-based food items are beneficial to our health and must not be spared: first, dairy fat aids fat reduction by metabolising resistant fat, and secondly, milk products are beneficial to our skin (Blog 1).
- ❖ Regrettably, the Indian nutrition sector has adopted the Western model, in which we reduce the human body to a measuring unit. "You should weigh this amount because you're 5'3". There ought to be awareness about it though, and it should begin in elementary school. The news press also plays a major role in this, considering how is it

saving lives if we all just speak about losing weight or how anyone looks skinny?"(Blog 2)

- ❖ “Every diet comes like a cult,” as mentioned by Ms.Rujuta in one of the interviews. “A diet that is only raw, or vegan will say it’s going to help you solve diabetes and obesity; a diet that is only meat will also say the same.” It's not just about the latest, most complicated-sounding elements that get you a social media hit; it's also regarding systemic and regulatory flaws (Blog 3).
- ❖ Plant-based diets require a plethora of healthy land in order for crops to grow. Soils act as a greenhouse gas chamber, and when they are ploughed and thrashed on a constant basis to farm the field, the churning releases carbon emissions which might usually be trapped in fertile soils. To attain the similar amount of agriculture productivity, nutritionally deficient soil requires more herbicides & insecticides, posing significant environmental problems by polluting soil, water, turf, as well as other greenery (Blog 3).
- ❖ Plant based diets benefit the planet in three ways: food diversification, reduced emissions, and the development of different food substitutes (Blog 3).
- ❖ People who follow vegan diet are more likely to seek out different nutrient meals, which serves to expand their eating options. To improve global and localised food production, we must focus on expanding our diets and purchasing habits (Blog 3).
- ❖ Although countless people believe that a diet which is based solely on plants is safer for our planet instead of one that includes meat and dairy, not all vegan products have a low ecological impact (Blog 4).
- ❖ If we do not even care as to where our food 's coming from & how it’s grown, our diets can have unintended consequences. Considering the strange example of two vegans who were found to get a substantially greater impact on the environment than many meat eaters in an Italian study. The experts investigated further and discovered that the two solely decided to eat fruits (Blog 4).
- ❖ A meal that is far more plant-based than it is presently, with 500 g of fruits and veggies per day and almost no red meat, is required. It is well known that many individuals struggle to consume that amount of green. Obstacles to consuming adequate fruits and veggies can be psychological, physiological, social, or cultural (Schmidt & Mouritsen, 2020; Cooper, Dedehayir, Riverola, Harrington, & Alpert, 2022).

Health

- ❖ Although meat and dairy are unquestionably important source of protein & essential minerals, the NHS advises avoiding red and industrialized meat due to the link to colon cancer. Fat content, which is found in a lot of cheese and meat, has indeed been related to heart problems (Blog 7).
- ❖ A vegetarian or vegan diet can be beneficial, but vegetarians and vegans must ensure that they obtain sufficient vitamin B12, calcium, iron, and zinc. The "Academy of Nutrition and Dietetics" warns that vegetarians and vegans are at danger of vitamin B12 deficiency. Vitamin B12 is just present in animal-based foods in nature. Anemia and blindness can result from a deficiency of vitamin B12 (Blog 23).
- ❖ Veganism is an excellent cure for the sickness of exploitative food systems in many circumstances. But, for the purposes of agricultural integrity, worker liberties, and the possibility of a relatively long transition, it's critical to recognise that it's not the solution (Blog 6).

Wastage

- ❖ Make all efforts to prevent "single-use packing" and recycling to be done as often as possible. Alternatively, concentrate on purchasing locally grown produce and consuming it all while discarding as much as possible (Blog 9).
- ❖ Fragile foods or food with short lives that degrade easily lead to the alarming fact that approximately half of all plant - based foods grown worldwide is lost every year, resulting in a complete wastage of all effort expended in their cultivation, transportation, and preservation (Blog 3).
- ❖ Moreover, according to a thorough investigation conducted by experts at the "University of Michigan's Center for Sustainable Systems", which collected information from round the globe and acknowledged other components of food like packing the food and the waste generated during manufacturing and transit, avocados have an overall carbon footprint of 0.55 kilogrammes per kilogramme (Blog 4).
- ❖ It is hoped that by utilising the leftover food to produce environmentally friendly compost substances for mushrooms to thrive in, through utilising the substance left also after post - harvest to generate compostable bags, and by channelising carbon dioxide in to the conservatory to cultivate the harvest, mushrooms will be considered completely organic (Blog 4).

- ❖ “A strict adherence to plant-based diets can also prevent us taking opportunities to minimise waste. Supermarkets throw away a quarter of a million tonnes of food every year here in the UK alone. So, I still buy meat and fish in supermarkets occasionally, but only when it’s on the yellow-label, “still fresh” discount counter – to me, that feels like the most sustainable decision at that point, as it avoids us wasting such an environmentally-costly product (and the death of an animal), without creating an increased demand that would encourage more such products onto our shelves. And what about offcuts and other less-desirable animal products that regularly go to waste – shouldn’t we be celebrating the people who eat tongue, trotters and snout rather than turning their noses up at it?” (Blog 9)

Local

- ❖ Rujuta's stance on local produce is based on the idea of "food miles", which she discussed. Meal miles basically means that the shorter the distance our food takes to travel, the smaller our belly will be (Blog 1).
- ❖ We're on the verge of a dietary transformation as we abandon our own local, conventional, diverse dietary habits which have always been locally sourced and accompanied the seasonal nature of yield. Overweight & all noncontagious diseases like diabetes, heart problems, psychological problems, which come along, might follow. (Blog 2)
- ❖ According to Scazzina, the ideal method is to adhere to domestically sourced, in-season fruits and veggies (Blog 4).
- ❖ “Clare Smyth, three-Michelin star chef and owner of Core restaurant in London, is a true believer in buying locally:” “As a chef I feel a responsibility to support sustainable, independent producers and do my bit for the environment by using local, good quality produce” (Blog 5).
- ❖ Plant-based diets can also have undesirable effects on conservation if we don't pay enough attention to the local context. Veganism is an insufficient remedy to the "ethical and environmental" difficulties it aims to answer because it places a narrowed focus on food products over food production. It also fails to prioritise agricultural production (Blog 6).
- ❖ The carbon footprint of cuisine which is plant based varies widely based on the customers' and suppliers' geographical contexts. One localized environment to examine is

culture. Veganism's classification as a morally better diet may have negative consequences for vulnerable groups (Blog 6).

- ❖ Localized analysis has the ability to uncover solutions that will render meat food items and the overall food business more viable (Blog 6).
- ❖ "Just a beginning point," Ulusoy, a vegan, says, "the most pragmatic answer that exists for us to actually exercise." Following a diet based on plant produce is a meaningful adjustment for those who have limited accessibility to a good standard of domestic and fairly traded food, and for those who are hesitant to assist to the reform of the commercial food industry as a whole. Veganism is an excellent cure for the sickness of unethical food production in several circumstances. But, for the interests of food autonomy, rights for workers, and the possibility of a relatively long transition, it's critical to recognise that it isn't the solution (Blog 6).
- ❖ Authentic produce is created in a sustainable and responsible manner; it is good exchange, supports food security, and is sourced domestically (Blog 6).
- ❖ Buying domestically procured, humanely reared chicken instead of a heavily processed substitute looks more perfectly reasonable — and purchasing domestically reduces gases generated by shipping fruits and vegetables out all over the nation, which is up a different area where the assertion that vegetarianism is more viable than other diets fall short (Blog 8).
- ❖ To lessen the environmental impact, just beginning to purchase the most of our food domestically — that is, at a local market instead of a hypermarketplace that buys goods from another region or even another nation (Blog 8).
- ❖ "I sometimes describe myself as a "sustainavore." In other words, I try always to make sustainable choices when it comes to what I eat. This means that, for the most part, I enjoy a plant-based diet. But I am not vegan, nor even entirely vegetarian. I do eat eggs from my rescue chickens, local honey, and occasionally local meat or fish" (Blog 10).
- ❖ Purchasing from a regional super marketplace is better for the ecosystem since farm owners produce their fruits and vegetables naturally rather than using fertiliser, their livestock and dairy come from livestock grown without steroids or antibiotics, and one can assist a local business (Blog 12).
- ❖ It's crucial to note, that 'food miles' are not really necessarily the ideal indicator of sustainability - and that certain locally produced fruit can offer a larger environmental impact than foreign goods (Blog 1).

- ❖ Although a meatless diet is linked to fewer emission levels, this does not imply that all plant-based products are exempt from ethical considerations. Numerous academics recommend that individuals, regardless of whether they are vegetarians, consume seasonal and domestically grown food to mitigate these significant ecological implications (Blog 17).
- ❖ “If you hop across the street, you’ll get berries from Portugal, but you won’t get fruit that’s growing 50 kilometres away from you.” There are significant gaps between rural and urban marketplaces (Blog 2).

Environmental

- ❖ Some items are discovered to have a larger carbon impact merely since they are transported by air. There are few types of berries which are frequently imported to make up for a shortage of local produce (Blog 10).
- ❖ Although vegan meat alternatives may not have the same negative climatic effects as meat, they nevertheless contribute to deforestation, habitat disruption, and carbon pollution during transit and manufacturing (Blog 6).
- ❖ In particular, any diet that cuts down on the intake of meat has a lower global impact than one that is high in animal proteins. This is because traditional meat industry has a lot of adverse consequences, notably for grazing animals that generate large amounts of carbon pollutants and demand a lot of resources to grow (Blog 3).
- ❖ Cattle bred for meat, devour plants as they develop, and because those plants are inefficiently transformed to protein, consuming animal protein significantly increases the proportion of natural resources necessary to create the exact calorie count as just growing plants for sustenance (Blog 3).
- ❖ Limiting meat intake and boosting intake of grains damages not only numerous animals but also the ecosystem (Blog 12).
- ❖ Why is the diet based on plants and plant products seen to be beneficial for the entire world? The enormous ecological impact of industrial livestock production is one solution. Meat and dairy (farmed livestock) account for 14.5 percent of all manmade greenhouse gas emissions, according to the United Nations. That's about the same amount of pollution as every automobile, train, ship, and airline on the planet! According to a 2016 analysis published in the academic journal "Proceedings of the National Academy of Sciences," if everyone went vegan, the world's food-related emissions would reduce 70% by 2050 (Blog 14).

- ❖ Huge commercialized avocado harvests are produced in Mexico and southern Spain, putting enormous stress on local ecology (Blog 4).
- ❖ People must resort to local food for the optimal achievement of a vegan diets (Blog 10).

Cost

- ❖ Another factor to keep in mind is the quantity of water resource used in vegan cuisine preparation. Fruits that thrive in hotter climates require large amounts of fresh water, which is often unavailable in local markets and must be imported. At 8.3 pounds per gallon, transporting water anywhere is an extraordinarily inefficient expense to the environment. Avocado irrigation is an excellent example of a popular and healthy plant-based protein replacement. Avocados are today being held responsible for the shortages as a result of this (Blog 3).
- ❖ How can we anticipate the less privileged in societal structure to prioritise the environment over their personal fundamental necessities when “oat milk” costs double as much as “cow 's milk” and “vegan cheese” are more expensive? (Blog 9)
- ❖ Changing climate is putting greater burden on the agribusiness, making it difficult to sustain a living providing food. Resulting in price swings in the agricultural sector, a widespread move to a plant-based diet may raise additional difficulties. The percentage of agricultural production for cattle feed would be reduced if people ate less meat (Blog 17).
- ❖ Although the advantages of vegan diets are well-known, authorities must take into account additional aspects in order to translate these advantages into sensible policy intervention and a peaceful transformation. Reduction in income for some farmers and cattle herders, dependency on international markets for food shipments, and special circumstances where meat may be advantageous are all factors to contemplate (Blog 17).
- ❖ Vegan diets are now the most cost-effective, saving close to a quarter on food. Dietary habits based on vegetables came in second. Vegan or vegetarian diets with minimal meat and milk consumption cut expenditures by 14%. Strict vegetarian diets, on the other hand, raised prices by up to 2% (Blog 19).
- ❖ Another apparent obstacle to a vegan diet is the cost of everyday diet, as well as the difficulty of obtaining vegan dietary supplies (Fehér, Gazdecki, Véha, Szakály, & Szakály, 2020).

The study suggested that instead of simply limiting meat and processed meals in general, a holistic approach may include many variables. All diets have benefits and drawbacks, so eliminating either one doesn't really fix the issue of climate change; instead, it causes new issues in other areas. We would not want to shift the balance further in either way or another by completely dismissing existing procedures or untested options such as plant-based foods, because the advantages of a broad, healthy diet are unlimited (Cooper, Dedehayir, Riverola, Harrington, & Alpert, 2022). The observations of Springmann et al. have supported such a comprehensive strategy. These researchers looked into a variety of options for achieving a worldwide viable food framework, such as plant-based diet modifications, technical advances, and food waste elimination, and discovered that no single metric is sufficient to keep planets impacts in check at the same time, and that a synergic approach is required (Blog 1). At the same time, the advent of mixed farming systems, which integrate agricultural and livestock production, reduces several of the ecological concerns linked with other, more intensive types of production, according to "Tuomisto." These farms avoid carbon pollution from commodity transit by utilising, for example, dung from animals effectively on plants. Concentrating on manufacturing process of food instead of the goods themselves results in successful solutions such as "mixed agricultural systems" (Blog 3). The consumer on the other hand can focus on consuming food more from their domestic markets, which will result in lower carbon footprint irrespective of the type of food being consumed. Hence, by moving ahead with a long-term vision, we will be able to make the right food choices to lessen the impact of climate change; maintaining our health in the process and at the same time, preserving our distinctive cultures on our way towards building a sustainable world.

6. RECOMMENDATIONS

- ❖ It is recommended that the governments, companies, institutes and NGOs support in spreading awareness about a sustainable living and hence a sustainable diet which focuses on creating a balance between the ecosystem.
- ❖ The study suggests that one should strive to purchase food from local markets and also eat seasonal food available in the domestic market in order to preserve the culture for instance as well as supporting the environment by producing less greenhouse gases and helping oneself in improving the health by going with the same approach.
- ❖ Focusing on how the food is being manufactured rather than only looking at the food products, which is a narrow perspective of viewing the prevailing situation.
- ❖ It is advised to consult a dietitian if following a plant-based diet as if one is not able to consume proper nutrition then it may lead to many nutrient deficiencies which may result in ill health.

7. LIMITATIONS OF THE STUDY

The project report had few limitations with regards to paucity of time to study the data available on various social media platforms such as content available on Instagram, YouTube, Facebook, Snapchat, Twitter etc. In this project, only few of the websites could be studied and analysed for understanding the shift in the consumer behaviour. The future researchers are suggested to gather data from various aforementioned platforms including the video blogs available and can also collect data by taking interviews of the experts in the industry.

8. CONCLUSION

The main aim of this project was to understand whether a plant-based diet is sustainable in the long run, based on the various factors which the experts have been quoting by not being influenced by the media houses but by understanding the bigger picture.

In recent decades, there has been an increase in the number of chronic diseases worldwide which is connected with the phenomenon of unhealthy lifestyle, poor dietary habits and consumption of excessive readily available food and beverages. Considering health as a major concern amongst many aspects of conservation (social, ecological and economic), it can be clearly said that establishing good dietary habits and producing food which can halt the spread of chronic diseases and help in laying the foundation for a prolonged healthy life expectancy, is of utmost importance. A shift in the consumer behaviour has been seen which is aimed at “lowering and minimising hazards” strategy as they are choosing meals that might help them avoid some undesirable wellness outcomes, following vegan diet is one of them. This plant-based dietary movement has become popular in recent years throughout the world, including consumption of fruits, vegetables and nuts in their raw form, as well as consumption of highly processed food products as an alternative to food available in its natural form like meat. Other reasons for this kind of a dietary switch include welfare of the animal, eco responsibility to combat climate change, spiritual grounds etc.

The analysis and findings of this paper share the importance of following a holistic dietary approach by catering to all the aspects seen from a broader perspective (including conservation of culture, minimum environmental effects of food etc.), would be the most feasible solution in the long-run.

Moreover, it should be considered that due to paucity of time, in this project, only data available on few of the websites could be studied and analysed, to understand the sustainability of vegan diet. Therefore, the future researchers are suggested to gather and analyse data available on various other social media platforms including the video blogs, posts etc. and are also advised to collect data by taking interviews of the experts in the industry.

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