

# **LACTO-VEGETARIAN DIET- A DIET FOR A BETTER HEALTH**

*Report of the research work carried out under the*

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### **Declaration**

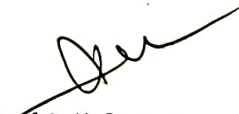
This is to certify that the research work carried out by me under DSRFP-2022 titled " **Lacto-Vegetarian Diet – A Diet for a Better Health**" is original. The contribution of others has been clearly indicated with due reference to the literature. This work has not been submitted elsewhere in any form.

Ritika Kapoor  
(Ritika Kapoor)

## Certificate

This is to certify that the report titled "Lacto-Vegetarian Diet – A Diet for a Better Health", submitted by Ritika Kapoor, in partial fulfilment of the requirement for DSRFP-2022, is the record of her own work carried out under my supervision. The matter embodied in this project has not been submitted elsewhere in any form.

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# Lacto-Vegetarian Diet: A Diet for a Better Health

## ABSTRACT

There has always been an unspoken fight between diets as to which one shall be the most beneficial for humans in terms of life span, mood, and other psychological or physiological factors. Vegetarianism has gained more popularity in recent years. Many diets, such as Lacto-vegetarian diet, Vegan Diet has been the hot topics owing to their beneficial results in terms of skin care, health, etc.

This study aims to focus on how Lacto-Vegetarian Diet, a part of Vegetarian diet can be superior in terms of life span as compared to non-Vegetarian diet. It focusses on the comparison between the diets, the health issues faced by the respective eaters, which type of eaters are more prone to diseases, how we can choose one diet in such a manner to get the best results out of it.

**Keywords:** Diet, Vegetarian Diet, Non- Vegetarian Diet, Lacto- Vegetarian Diet, diseases, psychological factors, physiological factors.

## 1. INTRODUCTION

Vegetarianism or vegetarian diet in simple words is the practice of abstaining from any kind of meat or by products of animal slaughter. It is not necessary that vegetarians don't eat by products of animals such as eggs, milk, etc. There are various kinds of vegetarian diets which are described below.

Vegetarian diet is broadly divided into the following types- Flexitarian, Pescatarian, Pollotarian, Macrobiotic Diet, Lacto-ovo-vegetarian, Lacto-Vegetarian, Ovo- Vegetarian, Vegan, Raw Vegan Diet and Fruitarian.

1. Flexitarian Diet- Flexitarian is a new type of vegetarian diet which has come to the market. As the name suggests, it is that type of diet wherein people have flexibility. They usually eat plant-based products but can occasionally eat animal products such as meat, etc. They are usually criticized for their choices.

2. Pescatarian Diet- People who follow Pescatarian diet do not feed on meat, poultry, etc. but they do eat fish and eggs. Most people don't include this diet within vegetarian diet.
3. Pollotarian Diet- In this type of diet, red meat, fish and sea food are avoided but people can eat poultry, fowl and eggs. Just like Pescatarian and Flexitarian diet, it is also a controversial type of diet as usually people don't include this type of diet within vegetarian diet either.
4. Macrobiotic Diet - This diet includes only unprocessed and unrefined foods that include mostly fruits, vegetables and whole grains. People can occasionally eat fish in this diet.
5. Lacto – Ovo – Vegetarian Diet - In this type of diet people can eat both eggs and dairy products apart from plant-based diet but poultry, fish and meat are not allowed.
6. Lacto – Vegetarian - The word lacto is derived from a Latin word, 'lactis' meaning milk. This diet includes dairy products but does not include meat, fish, eggs, etc.
7. Ovo – Vegetarian – These are the type of vegetarians who don't include meat, fish, etc. in their diet but do eat eggs.
8. Vegan - Vegan diet is such a vegetarian diet where people don't include fish, eggs, meat, sea food or even dairy products in their diet. They usually do so in order to protect animal rights and the environment.



9. Raw – Vegan Diet - This diet includes all the foods as mentioned in vegan diet excluding any unprocessed food or food that has been heated above 46 degrees Celsius. It is believed that it might damage the nutritional quality of food.

10. Fruitarian – Fruitarian diet as per its name only includes fruits in its diet.

Now coming to the non- vegetarian diet, non-vegetarian food or non-veg food contains all types of meat, eggs, fish, etc. This diet is eaten by majority of people in the world. They are also referred as omnivores. We will be analyzing both type of diets in terms of health and wellness which aims to help us in choosing which diet shall be the most beneficial for us.

The rest of the paper is organized as follows-

- Section 2 presents the benefits of Lacto – Vegetarian diet over Non – Vegetarian diet, describing how it is more beneficial in terms of health aspects.
- Section 3 describes few deficiencies which might occur by adapting a vegan or Lacto – vegetarian diet, i.e., plant-based diet.
- Section 4 is all about how such deficiencies can affect our health and how few supplements can help us overcome them.
- Section 5 concludes this research paper.

## 2. BENEFITS OF LACTO – VEGETARIAN DIET OVER NON – VEGETARIAN DIET

There is no denying that non- vegetarian diets have caused the highest number of diseases among humans as shown by a review published by Parker and Vadiveloo [1] wherein he they compared both vegetarian and non-vegetarian diets based on diet quality indexes. They conducted 12 studies which resulted in vegetarians having better diet qualities than omnivores.

The factor which helped the vegetarians have a better diet quality is that a lot of fruits, green vegetables, grains and sources of protein was found in their diet. The consumption of saturated fats and sodium is much lower in vegetarian diet. Hargreaves [2] also found out that a higher proportion of vegetarians had an adequate number of fruits and

vegetables in their diet when compared the Brazilian population where it is around 38.1 % vs 23.1% based on WHO recommendations. Not just this, a lower weekly consumption of artificial juices and soft drinks was also found in vegetarians as compared to non-vegetarians, 3.9% vs 14.4%. Out of all the types of vegetarians, vegans showed the best result. Another astonishing point which came up was that vegetarians in Brazil followed the diet recommendations led out for the Brazilian population. [3].

A study showed that cardiovascular diseases among other chronic diseases account for 43.6 percent of deaths [4]. Clinical trials which promoted vegetarian, vegan and plant-based diets showed much positive results in cardiovascular diseases [5-8].

An observational study which was done in 2018 assessed the cardiovascular risk factors in vegans and found out that in most countries, vegetarian diets included lower intake of saturated fats, energy drinks, and a better cardiovascular profile which included lower body weight, LDL cholesterol levels, triglycerides, fasting glucose, etc. [9].

Another study which was done by the Diabetes and Nutrition Study Group (DNSG) of the European Association for the Study of Diabetes (EASD) researched on vegetarian eating patterns and found out that there is a reduction of 28 percent in the incidence of coronary heart disease and a 22 percent reduction in mortality from such conditions. They gathered the data correlating different dietary patterns and cardiometabolic outcomes specially in diabetic patients [10] using systematic reviews.

Two main factors that are linked with cardiac vascular diseases namely, risk of diabetes and systematic inflammation were found much lower in a balanced vegetarian diet [11].

It was also found that plant-based diets have a protective effect over consumption of refined carbohydrates, sugary drinks and processed meats which helped in increasing the risk of type – 2 diabetes that too when combines with low consumption of fiber in the diet [12].

Kahleova and Palikanova [13] showed that the prevalence of diabetes is around 2 times lower in vegetarians as compared to omnivores.

A 24-week trial was held with diabetic and showed that those individuals who followed a vegetarian diet had a greater weight loss around 6.2 kg vs those who ate non-vegetarian diet, around 3.2 kg. They also showed better insulin sensitivity around 30 percent in vegetarians and 20 percent in non- vegetarians. There was also a greater reduction in visceral fats



and medication use along with a better hormonal profile and levels of anti-oxidants [14].

A major factor of longevity is the increased consumption of fruits and vegetables which are rich in phytochemicals. Cell structure damage can be prevented by control of low-grade inflammation provided by antioxidant protection which further leads to slowing down the aging process [15].

### 3. FEW DEFICIENCIES

Even though vegetarian diet provides tons of health benefits, there are still some points which we need to give attention to before adopting any diet. Vegetarian diets up to some extent have lower concentration of some nutrients which we need to look onto to have the best results. Such nutrients are iron, calcium, zinc, iodine, vitamins B12 and D, protein and omega-3 in adults [16] and especially in infants [17].

These nutrients being extremely important for a person's health could have adverse effects on their QoL and can impair an individual's health [16-18].

One of another main important deficiency which people might face is that of Vitamin B12 which is only found in animal-origin foods. Vegans have been shown to have lower levels of Vitamin B12. At the same time increased homocysteine is also found in vegans [19-21].

Neurological problems, development delay and anemia are caused by the deficiency of B12 and increased homocysteine. In addition to these, dementia, cardiovascular diseases and osteoporosis [19-21]. To avoid these adverse effects, we must make sure that we are getting enough supplement of B12 and increase the intake of fortified food.

We also need to adjust the level of iron in our body which is used for hemoglobin formation and oxygen transport in the body. The level of Serum Ferritin, a protein is usually lower in vegetarians which is responsible for storing iron in our body. As studies show that lower levels of iron cause anemia [22] which is also caused by deficiency of Vitamin B12 [21], both being nutrients which are usually in deficiency in vegetarian diet. This being the reason, vegetarian diets need to be planned keeping all the factors in mind as it could negatively affect the 'energy and fatigue' in the physical domain of QoL [22].

Bone health is also affected by vegetarian diet up to some extent. A review which was published in 2019 showed that vegans and vegetarians have lower bone density than omnivores or non-vegetarians and vegans

on top of that also have higher fracture rates. One of the factors behind these results is probably the lower calcium intake as bone health is made up of many different factors and mechanisms [23].

A recent study done by Menzel and his team mates showed that vegans have lower bone health when compared to omnivores when measured using QUS (Quantitative Ultrasound) [24], which solidifies the need and urgency for proper diet planning among vegetarians.

### 4. SUPPLEMENTS FOR LACTO - VEGETARIAN DIET

#### 4.1 VITAMIN- B12

Non-vegetarian diets include enough B12 as required by the human body but as vegans or vegetarians (some) don't intake animal products, it becomes difficult to meet the daily intake of Vitamin B12. An analysis among vegans, vegetarians and omnivores was done to find out the ratio of deficiency and it was found that out of 232 vegans who participated nearly half of them has Vitamin B12 deficiency. When compared to other dietary groups, vegans showed the lowest B12 levels and highest ratio of deficiency. As per NIH, National Institute of Health, teenagers and adults require 2.4 micrograms (mcg) of Vitamin B12 per day. People who are pregnant or are breastfeeding need nearly 2.6 mcg or 2.8 mcg respectively.

Symptoms of Vitamin B12 deficiencies are-

- Tiredness
- Constipation
- Unexpected Weight loss
- Weakness
- Balance problems
- Loss of appetite
- Tingling in the hands and feet

To overcome this deficiency, we need to take Vitamin B12 supplements or B complex supplement. Some vegan foods also provide B12 but it may not be enough. One should speak with their doctor before taking any action.

#### 4.2 OMEGA 3S

As we know Omega-3 fatty acids are much important for heart and brain health. It also affects the skin, if Omega-3 is not taken in adequate amount, it can cause itchy rashes,

swollen, dry patches. Types of Omega-3 are Alpha-linolenic acid (ALA), Docosahexaenoic acid (DHA) and Eicosapentaenoic acid (EPA). Our body has a system which can convert ALA to DHA and EPA, though in very small amounts. This is why usually people focus on their consumption of ALA. However, not much ALA is converted to DHA or EPA, the rate is very low around 5-8%, hence enough amount of DHA or EPA must also be taken.

Plant based foods that contain ALA are-

- Nuts
- Plant oils, such as canola oil
- Seeds, such as chia or flaxseeds
- Fortified foods, such as cereals or juices.

One shall make sure not to focus too much on ALA as it can cause too much of linoleic acid in the body which is a type of fat found in foods like soybean or canola which hampers the conversion of ALA to DHA and EPA.

One of the vegan sources of DHA and EPA is algae which can be consumed by vegans if they wish.

#### 4.3 IRON

Iron, as we all know is one of the most important minerals as it helps with functions throughout the body. It helps in blood cells carrying the oxygen and supports brain health. If Iron is not taken in adequate amount, it can cause anemia, which restricts oxygen delivery to cells of the body. There are many other symptoms of iron deficiency which are mentioned as follows- weakness, tiredness, difficulty concentrating, stomach problems and increased susceptibility to infection.

Non – Vegetarian food such as meat, fish and eggs contain Heme iron which can be easily absorbed whereas plant-based products contain nonheme iron which is not easily absorbed by the human body.

Adult males as per the NIH report require around 8 mg of iron per day and females as per the same require nearly 18 mg of iron. But for those people who are vegans or vegetarian usually intake nonheme iron which is harder to absorb, vegan people

The NIH report that adult males typically required around 8 mg of iron per day and adult females require around 18 mg. But as nonheme iron is harder to absorb, people with vegan diets require around twice these amounts.

Some of the plant-based sources of iron are mentioned below- lentils, raisins, nuts, beans, spinach, peas, etc.

#### 4.4 VITAMIN D3

Vitamin D is also such mineral that helps in absorbing calcium for healthy bones and protect the body against chronic diseases such as osteoporosis. One of the best sources for Vitamin D is sunlight. Some foods do naturally contain Vitamin D but due to manufacturing and methods of packaging they have to go through they lose their qualities. Basic examples of such foods being milk and cereals.

Two of the main types of Vitamin D are D2 and D3. Vitamin is more beneficial as it boosts the level of Vitamin for longer periods as compared to Vitamin D2. Since, animal products are the only source of Vitamin D3, vegans or vegetarians must feed on supplements to avoid any such deficiency. Lichen is used as a source. Whereas, vegans can get D2 from supplements, mushrooms and fortified foods.

Vitamin D deficiency is becoming common day by day and every person should get their level of Vitamins once in a while with a blood test. A supplement may be recommended by a doctor depending on the result.

DEFICIENCY	SIDE EFFECTS	SUPPLEMENTS
Vitamin B12	Loss of balance, tiredness, loss of appetite	Vitamin B12 supplement of B complex supplement
Omega 3S	Itchy rashes, swollen dry patches	Nuts, plant oils, seeds, cereals, juices
Iron	Anemia, weakness, stomach problems	Lentils, raisins, nuts, beans, spinach
Vitamin D3	Fatigue, bone pain, muscle weakness	Sunlight, Vitamin D3 medical supplements

Table describing the deficiencies, side effects and supplements



## 5. CONCLUSION

In conclusion, Vegetarian diet or to be precise Lacto – Vegetarian diet can have both positive or negative influences on a human body depending upon various factors such as life style, physical exercise, food quality, etc. But if we come down to choose which diet is superior in terms of life span or staying healthy, Lacto- Vegetarian diets wins it, provided we do undertake the necessary measures to make sure we don't face any deficiency. Non-Vegetarian diet, despite all of its significances have proved to cause adverse effects on human body from time to time whereas Vegetarian diet has proved to be more beneficial in terms of life span, activeness, mood of humans. We can't say that any particular diet is the best for every person out there as there are many factors which play a role in this. All we can say is that choosing a diet which is best for us and our surroundings is extremely important.

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## 7. CRITICAL ASSESSMENT BY THE SUPERVISOR

This paper talks about various types of vegetarian diets and how a Lacto-vegetarian diet is superior than a non-vegetarian diet. This study also points out some of the shortcomings of Lacto vegetarianism and suggests some supplements that need to be taken in order to overcome these shortcomings.