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Perception towards high biological value foods among nutrition students

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Abstract : In an era where awareness about health, nutrition and fitness has taken center stage, there still is much to be known about the essential 'building block' of life – Protein. Many reports indicate that majority of Indians are not aware of what is their ideal daily protein intake requirement. The information regarding the perception of high biological value foods among nutrition students were collected using the questionnaire in the Google form. Among the 100 selected nutrition students, 19% are vegetarians and 81% students preferred non- vegetarian sources. Nearly 95% of the students aware of the term high biological value foods. Among the vegetarian respondents, 17±1.8 of them preferred milk and yogurt, whereas 79±1.5 respondents preferred egg in non-vegetarian respondents. Majority of the students both dayscholars and hostellers had high biological value foods by weekly once or twice only. Regarding the intention towards high biological value food consumption, it was clear that 72% of the total respondents consumed for its nutritive value, 20% for taste, 5% for its variety and only 3% consumed for its aroma. Hence majority of the selected nutrition students have knowledge on the high -biological value foods but the intake need to be improved.

Keywords: High biological value foods, protein, vegetarian source, non-vegetarian source, nutrition, students

INTRODUCTION

Protein is a nutrient that the body requires to grow, repair, and function effectively found in a variety of foods, and it's critical to consume enough protein in the diet on a daily basis. The amount of protein that require in the diet is determined by the weight, gender, age, and health. Eating a variety of meals can help a person to meet the protein requirements. Plant and animal sources of protein include meat and fish, eggs, dairy products, seeds and nuts, and legumes such as beans and lentils (https://www.betterhealth.vic.gov.au/health/healthyliving/protein). Proteins are made up of building blocks called amino acids. There are about 20 different amino acids that link together in different combinations. Our body uses them to make new proteins, such as muscle and bone, and as an energy source. Some amino acids can be made by the body - there are 11 of these and they're known as non-essential amino acids (https://www.livescience.com/53044-protein.html). Dietary proteins are found in animal-based foods, plant-based foods, and alternative sources such as algae, bacteria, and fungi (mycoproteins). FAO, report (2010) states that globally, plant-based foods are the leading source of protein, comprising 57% of daily protein intake, followed by meat (18%), dairy (10%), fish and shellfish (6%), and other animal products (9%). In contrast, Food Standards Agency & Public Heath England National Diet and Nutrition Survey (NDSN) reports that the main source of protein in the British diet is animal-based, contributing to nearly two thirds of total daily protein intake.

Hoffman and. Falvo (2004) states that a complete protein is another term for a high-quality protein. Several key definitions and descriptions of high-quality protein are provided below:

- **Complete protein** is a type of protein that contains all of the essential amino acids. Protein is made up of amino acids, which are the building components.
- **Biological Value (BV)** – Biological value, or BV, is a metric that assesses the quality of a product. When a protein has a high BV, it suggests it has enough amino acids to make all of the proteins your body requires.
- **Digestible Protein** - The capacity of your body to break down and utilize food is a factor in how digestible it is. Tough meat is usually more difficult to digest than lean meat. Cooked eggs of any kind are considered easily digestible.

Animal protein

Proteins from animal sources (i.e. eggs, milk, meat, fish and poultry) provide the highest quality rating of food sources. High protein diets are associated with high intakes of saturated fats and cholesterol. There have been a number of health concerns raised concerning the risks associated with protein from primarily animal sources.

Animal proteins include casein, whey protein, gelatin, egg proteins, and fibroin. Proteins isolated from milk are one of the most commonly used proteins from animal sources. If milk is acidified or treated with chymotrypsin, then the casein precipitates, while the Whey protein remains soluble. Whey proteins are water-soluble globular animal proteins with a relatively low heat stability. Albumins are attractive proteins for the production of micro particles or nanoparticles

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as they are biodegradable and nontoxic. Albumins are water-soluble globular animal proteins with a relatively low heat stability. The sources of animal protein are poultry, red meat, processed meat, egg and sea foods

Vegetable protein

Vegetable proteins provide for all of the essential amino acids and are considered an excellent source of protein. Popular sources include legumes, nuts and soy. Vegetable protein can also be found in a fibrous form called textured vegetable protein (TVP). TVP is mainly a meat alternative and functions as a meat analog in vegetarian hot dogs, hamburgers, chicken patties, etc. The source of vegetable protein are legumes, nuts and seeds, whole grains and some fruits and vegetables

Animal protein Vs Vegetable protein

From infancy to adulthood, it appears that protein from animal sources is a major source of protein for humans. However, the potential health risks of a diet high in protein derived exclusively from animal sources must be considered. Vegetable proteins, when combined with other sources, may provide equivalent benefits to protein derived from animals. Moreover, maintaining lean body mass may become a concern. However, there is some fascinating data on the health benefits of soy protein ingestion.

Biological value of foods

Biological value (BV) is a measure of the proportion of absorbed protein from a food which becomes incorporated into the proteins of the organism's body. The biological value is a method of determining the quality of protein by dividing the nitrogen required for tissue synthesis by the nitrogen taken from meals. To express the overall proportion of nitrogen used, the biological value is converted to a percentage. To put it another way, the biological percentage is a measurement of how well your body utilizes – or absorbs – protein from your food. Foods that have a higher proportion of necessary amino acids have a higher biological value. As a result, animal sources have a higher biological value since they include more necessary amino acids (makes sense). The biological value of a protein is determined by its amino-acid content in relation to human needs, as well as its digestibility, absorption, and integration into body proteins. Much studies examining how much protein is taken as intact amino acids and used for protein synthesis, nucleotide bases, and other less abundant compounds (Meier et al., 2015).

In this digital era where awareness about health, nutrition and fitness has taken center stage, there still is much to be known about the essential 'building block' of life – protein. Many reports indicate that majority of Indians are not aware of what is their ideal daily protein intake requirement. It then comes as no surprise when surveys reveal that consumption of this macronutrient has been on a gradual decline (Source: NSSO), leading to protein deficiencies in approximately 73% of Indians today (Source: IMRB 2017). These startling statistics reveal the urgent need for sound awareness around protein, which is also the first step to tackling its widespread deficiency. This is where public health campaigns like the government's "Eat Right India" and others such as "Right To Protein" come to play. These initiatives are cultivating conversations around the nutrient to ensure that people are not only aware but, get access to necessary tools towards protein sufficiency leading to overall health and wellness (Indian Council of Medical Research (ICMR) report, 2020).

Evidence suggests that current dietary recommendations for protein intake may be insufficient to achieve this goal and that individuals might benefit by increasing their intake and frequency of consumption of high-quality protein. Hence the present study was aimed to know the consumption of high biological value foods among nutrition students.

METHODOLOGY

Around 100 college students were purposively selected for the study. The data regarding food preferences, availability, biological values, preparation of food and data whether the student is dayscholar or hosteller were collected using the online proforma schedule designed by the investigators. The responses regarding knowledge and preference of high biological value foods were collected. Constructed online questionnaire was circulated among the subjects and data about food preference, preparation, consumption and frequency of consumption of vegetarian and non-vegetarian food items and knowledge regarding questionnaire about high biological value foods were collected. Further question was included based on awareness about high biological value food consumption to know the knowledge of the above. The received responses were analysed using Microsoft Excel sheets and the results were expressed in percentage and mean with standard deviation

RESULTS AND DISCUSSION

1. Background information of the subjects

The participants of the present study were the college students undergoing their post-graduation in nutrition and dietetics. Among the 100 study participants, 89 participants were female and 11 were male. The goal proposed was to investigate if hostellers have the same easy access to non-vegetarian foods with high biological value as dayscholars. In the present study 54% were dayscholars and 46% were hostellers.

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Around 19% of the participants were vegetarians and 81% non-vegetarians. It was found that 95% were aware of the term biological value foods and five percent were not aware of the term. Majority of the dayscholar and hosteller respondents 99% and 85% respectively reported that they have availability of high biological value foods, whereas 15% of the hosteller respondents recorded the unavailability of high biological value foods.

2. Preference of biological value foods:

Among the 100 nutrition student participants the choice of preferring high biological value vegetarian foods and non-vegetarian foods were discussed below.

a. Vegetarian foods

Table 1

Preference in high biological value vegetarian foods

S.No	Vegetarian food sources	No of responses (n=19)
1	Milk and yogurt	17±1.8
2	Whole grain cereals and legumes	16±1.7
3	Vegetables	14±2.2
4	Nuts and seeds	12±3.4

Each person will have their own specific preference and will eat different types of vegetarian food. In the given vegetarian options among 19 respondents, 17±1.8 of the total respondents preferred milk and yogurt, 16±1.7 preferred whole grain cereals and legumes, 14±2.2 chosen vegetables and 12±3.4 desired on nuts and seeds. It was clear that most of the students preferred milk and yogurt in vegetarian foods.

b. Non- vegetarian food

Table 2

Preference in high biological value non- vegetarian food

S.No	Non-vegetarian food sources	No of responses (n=81) (Mean±SD)
1	Egg	79±1.5
2	Fish	45±5.4
3	Chicken	44±6.8
4	Red Meat	11±2.3

In the given non-vegetarian options among 81 respondents, most of them (79±1.5) preferred egg, 45±5.4 preferred fish, 44±6.8 chosen chicken, and 11±2.3 opted red meat. It was clear that most of the students preferred egg in non-Vegetarian foods followed by fish and chicken.

3. Consumption pattern of high biological value foods

Based on short-term nitrogen balance studies, and ICMR report (2020) the Recommended Dietary Allowance (RDA) of protein for a healthy adult with minimal physical activity is currently 0.8 g protein per kg body weight (BW) per day. To meet the functional needs such as promoting skeletal-muscle protein accretion and physical strength, dietary intake of 1.0, 1.3, and 1.6 g protein per kg BW per day is recommended for individuals with minimal, moderate, and intense physical activity, respectively. From the below figure 1 it was clear that majority of the students both dayscholars and hostellers had high biological value foods by weekly once/twice only.

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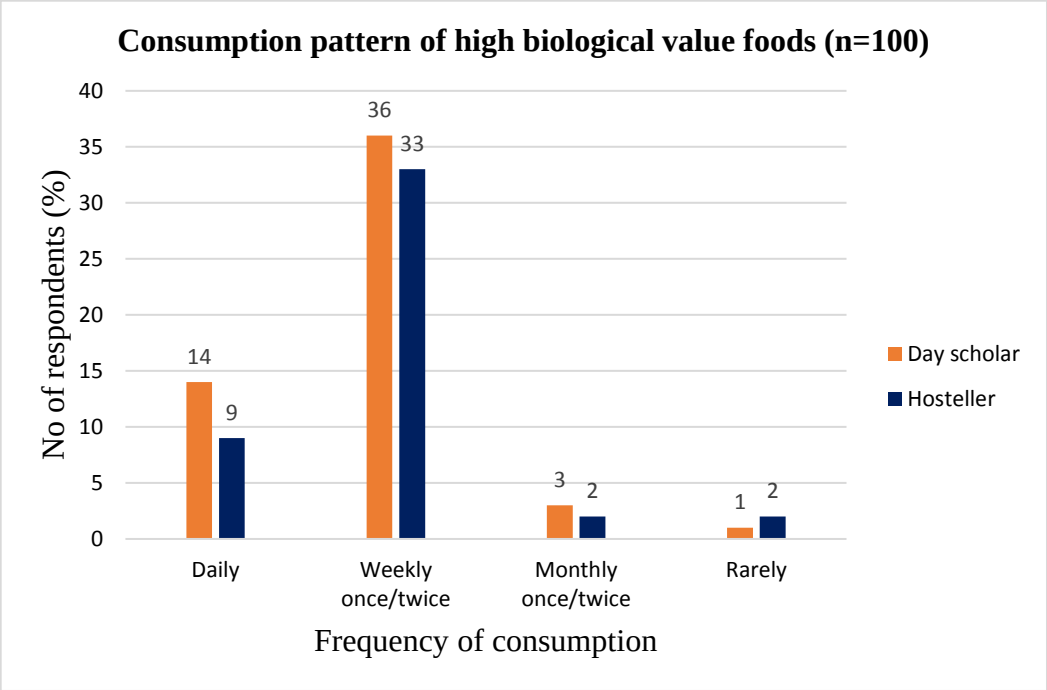

Figure 1. Consumption pattern of high biological value foods

4. Intention for the consumption of high biological value foods

The reason for the preference of high biological value food varies among student participants. By this study, it was clear that 72% of the total respondents consumed for its nutritive value, 20% for taste, 5% for its variety and only 3% consumed for its aroma. Thus, most of the nutrition student participants consumed high biological value foods for its nutritive value as shown in the below pie chart.

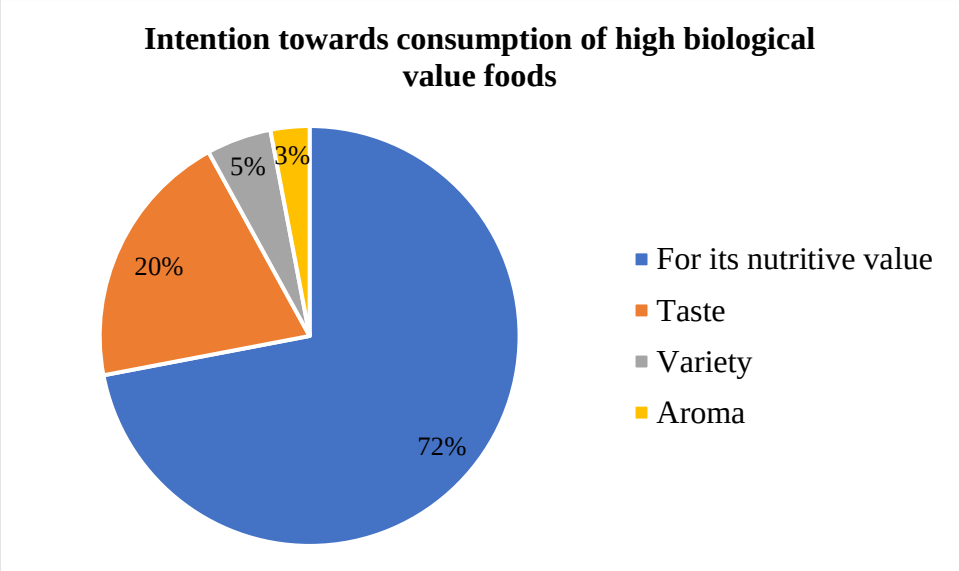

Figure 2. Intention towards consumption of high biological value foods

CONCLUSION

Nowadays up-skill education has improved and youngsters are very much aware of healthy food consumption. Technological development has lead to lifestyle and dietary changes. Students being indulged in education, other co-curricular activities and responsibility, they ignore to take attention on the type of food they consume. Majority of the

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student respondents both dayscholar and hosteller in the present study proved that they were aware of high biological value foods which was available to them. It was evident that most of the students consume non- vegetarian foods which has high biological value of protein. The study proves that the subjects who are vegetarian and lacto- vegetarian consume adequate amount of dairy foods. Students who prefer non vegetarian foods make it efficient by consuming meat and milk products. Though the majority of dayscholar and hosteller students in the study were aware of the high biological value foods, they need to improve the intake of high biological value foods.

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