Original Research Article

Nutritional Profiling & proximate analysis of Developed Vegan Honey Tender Bamboo Shoots Murabba

ABSTRACT

The nutritional value of plant-based foods, which account for a substantial portion of the diet, is crucial in determining how well all humans grow and develop. The main components of the food are proximate principles, sometimes known as carbohydrates, fats, and proteins; minerals and vitamins make up a very small portion of the diet. The relative concentrations of various ingredients, such as proteins, lipids, vitamins, and minerals, define the quality of food. Data about the sample's quality, such as the quantity of moisture, ash, volatile matter, and fixed carbon, are usefully obtained via proximate analysis in plants. Because bamboo shoots have such important health benefits, the current study concentrated on using them to produce items. The aim was to produce the highest-quality desserts using less expensive ingredients while maintaining a high nutritional profile. The bamboo shoot had relatively highfibre content (24.44%), protein content (3.26%), and a low-fat content (1.46%), energy (244.01 kcal), ash(1.50), and moisture (18.11%) according to its approximate composition. Bamboo murabba Similar mean values for T1 were discovered to have 3.25% protein and 2.48% fibre, followed by mean values for T5 with 3.39% protein and 1.97% fibre. Means for fat percentage were found to be non-significantly different across all treatments. All treatments had a considerable impact on physical traits like thickness, width, and spread factor. The spread factor of the murabba was noticeably reduced as the amount of vegan honey tender bamboo shoots murabba increased. Bamboo shoots, a cheap and easily accessible source, present a fascinating new potential component as a food element, particularly in murabba. When mixed with vegan honey, cinnamon powder, cardamom powder, water, jaggery, lemon, and ginger, physical traits demonstrated characteristics. The sensory analysis conducted for this inquiry demonstrates that the vegan honey tender bamboo shoots murabba was determined to be acceptable.

Keyword: Development, Proximate analysis, Antimicrobial activity, Bamboo shoots murabba, vegan honey

1. INTRODUCTION

The Poaceae family of bamboos is most recognised for its industrial use. Because of their distinctive life form, ecological significance, and the numerous uses and values they provide for humans, they are plants of universal interest. More than 2 billion people rely on it to meet their basic requirements today, and as a plentiful, renewable, useful, adaptable, cheap or free resource that improves the environment, it has the potential to enhance quality of life, particularly in rural areas of emerging nations. Bamboos are gaining popularity as a substitute crop that offers a variety of advantages and applications while also giving people access to a variety of living resources. They are a crucial component of the cultural, social, and economic realities of rural and tribal groups since they are intertwined with their tradition and culture. In addition to being delicious, bamboo shoots are also high in nutrients, particularly proteins, carbs, minerals, and fibre, while being low in fat and sugar. They also contain phytosterols, which can be classified as nutraceuticals or natural medicines, and a significant amount of fibre, which are grabbing the interest of both scientists and health advocates.According to recent studies, bamboo shoots can improve appetite and digestion, help people lose weight, and even treat cancer and cardiovascular illnesses.

According to reports, the shoots have antiviral, antibacterial, and anticancer properties. Shoots have the ability to act as antioxidants since phenolic chemicals are present. The field of functional foods has been pushed by consumer tendencies towards more health consciousness, and bamboo shoots may fall under this category. Breakfast cereals, fruit juices, meat and bread products, sauces, shredded cheeses, biscuits, pastas, snacks, frozen desserts, and many more culinary items now frequently contain bamboo fibre.The demand for natural and organic foods has grown significantly throughout the world, including for bamboo shoots (Narmilan and Amuthenie, 2015). According to Nirmala et al. (2011) and Bhatt et al. (2004), edible bamboo species are crucial to the nutritional security of tribal populations in many countries. They have also recently emerged as one of the key commodities in the international trade of bamboo goods. The two native species of bamboo shoot are traditionally consumed in Ethiopia.The produce the highest-quality desserts using less expensive ingredients while maintaining a high nutritional profile. The bamboo shoot had relatively highfibre content (24.44%), a protein content (3.26%), and a low fat content (1.46%), energy (244.01 kcal), ash(1.50%), and moisture (18.11%) according to its approximate composition. Bamboo murabba Similar mean values for T1 were discovered to have 3.25% protein and 2.48% fibre, fat 0.31% carbohydrate 61.35%, energy 260.25 kcal, ash 1.60, moisture 25.16% followed by mean values for T5 with 3.39% protein and 1.97% fibre, fat 0.31%, carbohydrate 62.68%, energy 267.07 kcal., ash 1.75, moisture 31.87%. Means for fat percentage were found to be non-significantly different across all treatments. All treatments had a considerable impact on physical traits like thickness, width, and spread factor. The spread factor of the murabba was noticeably reduced as the amount of vegan honey tender bamboo shoots murabba increased. Bamboo shoots, a cheap and easily accessible source, present a fascinating new potential component as a food element, particularly in murabba. When mixed with vegan honey, cinnamon powder, cardamom powder, water, jaggery, lemon, and ginger, physical traits demonstrated characteristics.Bamboo shoots with vegan honey as a value-added product. Murraba can help to improve childhood height, and it can also help to normalize bone-aging discomfort. The distinctive feature of this bamboo murabba is that it aids in the treatment of bodily joint ailments. The fact that we cooked this murabba at home is also a plus. Eating bamboo with your food offers numerous health benefits, including enhancing immunity, defending against infections and viruses, reducing weight, increasing height, improving heart health, building up the body's strength, and preventing exhaustion and sloth, among many more. We are striving to increase the nutritional benefits of bamboo murabba by putting vegan honey into our product.

2. Material and methods

2.1 Collection of material

The samples used for the research work were Apple fruits, Jaggery, Spices i.e. Ginger, Cinnamon and lemon market of purchased from local market of BBAU Gate no -1, Lucknow, UP, India. The Dendrocalamus strictus sample's edible shoots were procured from local sources in the Indian village of Muda Neemgaon, in the district of lakhimpur kheri, in the state of Uttar Pradesh. 2 weaks after collection, the samples were brought to the lab. The shoots underwent defoliation and washing in the lab. After the undesirable components were eliminated, the soft, palatable sections were used for further processing.

2.2 Location of the study

The preparation of bamboo murabba was carried out in the Food Science & Technology laboratory, USIC Laboratory, and chemistry lab. Department of Food and Nutrition, School of Home Science, Babasaheb Bhimrao Ambedkar University, Lucknow, in addition to complete all the study's.

2.3 Proximate composition analysis

The moisture content of the sample is determined by drying it in a hot air oven at 100 0c and then sun drying it. By incinerating the sample in a Muffle furnace at 558 °C for 10 hours, the ash concentration was determined. The crude fat content was calculated using the Soxtec technique using petroleum ether as the extracting agent (60-80 °C). The fibre content was determined using Foss FibretecTM, and the crude protein content was determined using a digestion unit, an auto distillation unit, and titration using the Kjeldahl method.

2.3.1 Moisture

Moisture is always present in foods. The sample was dry in an oven for 12 hours at 100°C before being chilled in desiccators to absorb moisture and measure moisture content. The process was repeated until the sample showed the same weight each time.

$$\textbf{Percentage \% moisture} = \frac{\mathbf{W1 - W2}}{\boldsymbol{W1 - W}} \times \mathbf{100}$$

W- Is the weight of the empty crucible,
W1- is the weight of the crucible with the sample, and
W2- is the weight of the crucible with the dried sample.

2.3.2 Ash

Ash was measured by properly weighing 5-10 grammes of the bamboo murabba sample into a previously weighed crucible. The sample was burnt at 600°C to ensure that all of the ingredients burned except the minerals in the food.

$$\textbf{percentage of ash} = \frac{\textbf{mass of ash}}{\textbf{mass of sample}}$$

2.3.3 Protein

Protein levels were estimated using the Kjeldahl approach (Parveen and Khatkar, 2015). A sample's digestion, distillation, and titration are all steps in the process. Fresh tender bamboo shoots was using a digestion mix and concentrated sulphuric acid. Following dilution, 10 mL NaOH (Sodium hydroxide) was added, which was followed by distillation. The distillate was then collected in a conical flask (capacity 50 ml) containing 5 ml boric acid and 2 drops indicator, which were combined until the solution changed colour.To determine the value, the distillate was titrated against standard hydrochloric acid.

$$\textbf{Percentage of protein} = \frac{(c-b)\times 14\times d\times 6.25\times 100}{a\times 100}$$

a = sample weight (gm);

b = volume of NaOH necessary for titration for sample;
c = volume of NaOH required for titration for blank;
d = normality of NaOH used for titration; the conversion factor is 6.25; and the atomic weight of nitrogen is 14.

2.3.4 Fat

The soxhlet extraction method was used to examine crude fat. Five grams fruit sample was taken in preweighed thimbles. Extraction was performed for 2 hours using petroleum ether.

$$\text{Percentage of fat} = \frac{W2-W1}{Weight\ of\ the\ sample} \times 100$$

W1 = weight of beaker;
W2 = weight of beaker with fat

2.3.5 Crude fibre

The crude fibre content was determined using Fibre plus (Parveen and Khatkar, 2015). For acid and base digestion, sulphuric acid (0.255N) and sodium hydroxide (0.313N) solvents were utilised, respectively. After boiling the extract, it was placed in a muffle furnace for 30 minutes to eliminate carbonaceous elements, and the weight loss was calculated as crude fibre.

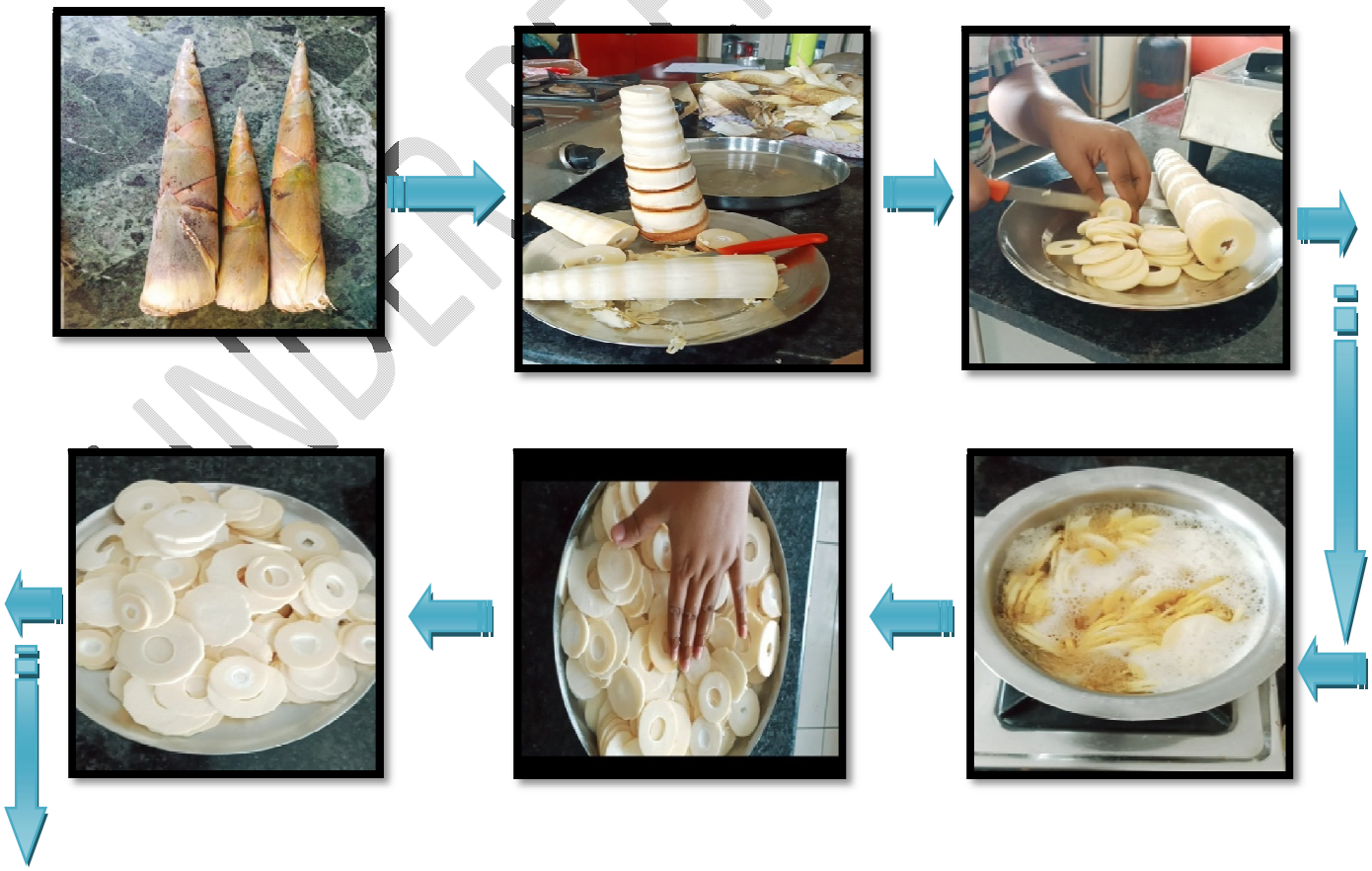
$$\text{percentageoffibre} = \frac{massoffibre}{massofsample} \times 100$$

2.3.6 Carbohydrate The following formula was used to calculate carbohydrate: Total carbohydrate (per 100 gm of sample) = 100 (ash + moisture + fat + protein + crude fibre). Energy (in Kcal) is calculated as 4 (protein and carbohydrate mass in grammes) + 9 fat mass in grammes.

3 RESULTS AND DISCUSSION

The proximate nutritive component of nine spice plants is presented. When compared to ash, crude protein, crude fat, crude fibre, and total high content carbohydrate and energy content, all of the samples have a comparatively moisture content.

3.1 Flow chart Preparation of vegan honey tender bamboo shoots murabba



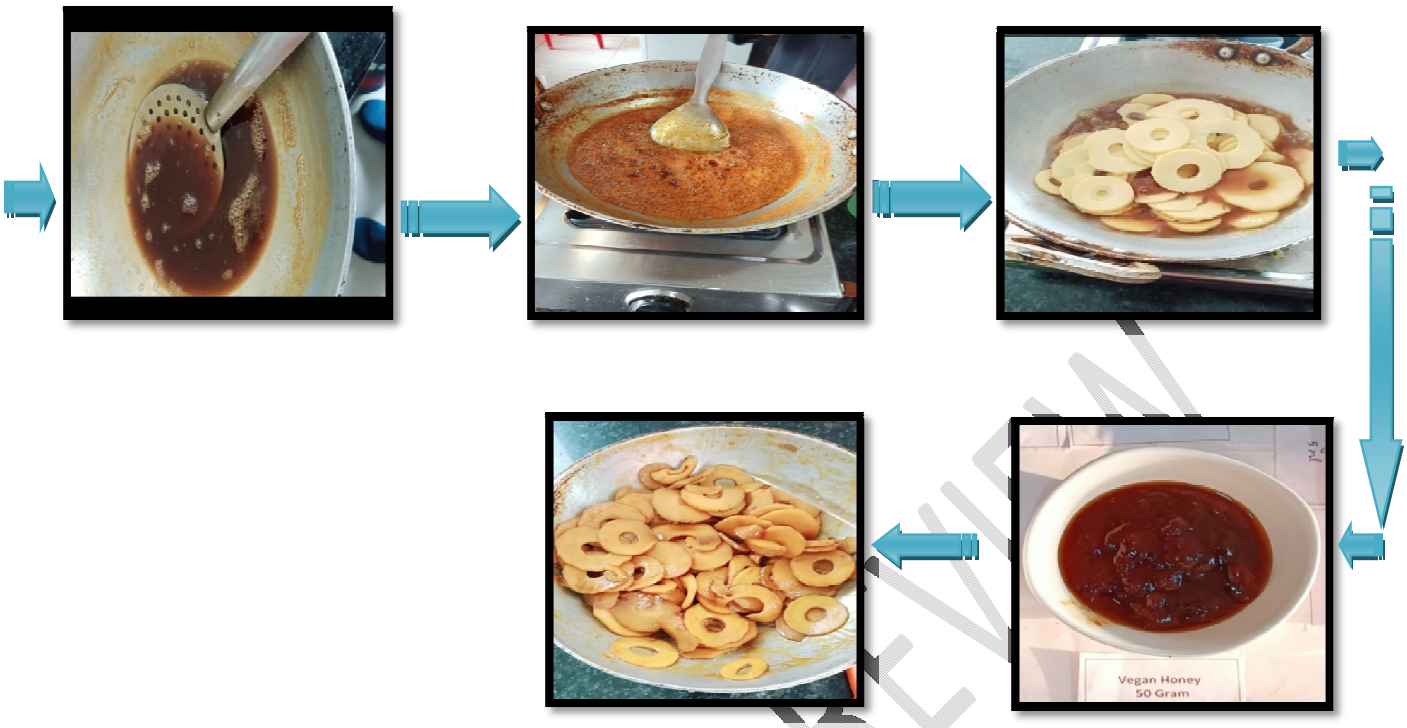


Chart 1. Preparation of vegan honey tender bamboo shoots murabba

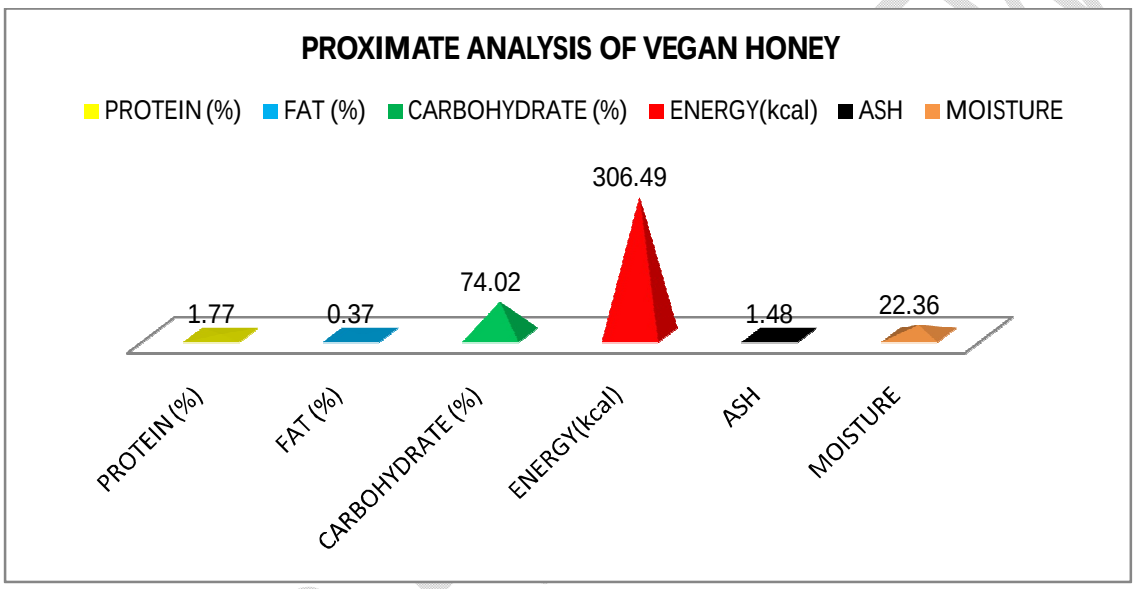
Murabba was cooked using the bamboo shoots was boiled then started cooking with jaggery then they includes vegan honey, jaggery, Cinnamon powder,Cardamom powder, Ginger juice, Lemon juice, Water. The mix was cooked at medium temperature on 15 minutes, then chilled and depend an additional minutes.When the vegan honey bamboo shoot murabba sample was prepared, the sensory evaluation took place five hours later. 40 untrained students from Babasaheb Bhimrao Ambedker University Lucknow composed the sensory panel. Murabba sample was evaluated on a 9-point hedonic scale for flavor, scent, texture, appearance, and over all acceptances. Since the 9-point hedonic scale demonstrates and explained the level of consumer acceptability and pleasure. The hedonic rating card that is displayed in the table was handed to them

3.2 Proximate analysis

The results obtained for the proximate analysis of fresh and processed vegan honey and bamboo shoots murabba. The moisture, carbohydrate, fat, ash, and protein content of the murabba sample were nearly identical. This finding is similar to the current study's findings. The fat content did not alter significantly. This is because fruits have less fat. In our investigation, we saw similar protein content patterns. The energy value of bamboo murabba which could be attributed to the higher sugar, carbohydrate, and energy content. The variation in proximal composition is caused by soil profile, variety variation, climate, location, cultivation, and so on. There were considerable differences in proximate vegan honey, and vegan honey tender bamboo shoots murabba. In terms of proximal characteristics, the overall results showed that there were substantial of vegan honey tender bamboo shoots murabba.

Table: 1. Vegan honey nutrition value/100gm

S. N.	PARAMETERS	TEST RESULTS
1.	PROTEIN (%)	1.77
2.	FAT (%)	0.37
3.	CARBOHYDRATE (%)	74.02
4.	ENERGY (kcal)	306.49
5.	ASH	1.48
6.	MOISTURE	22.36



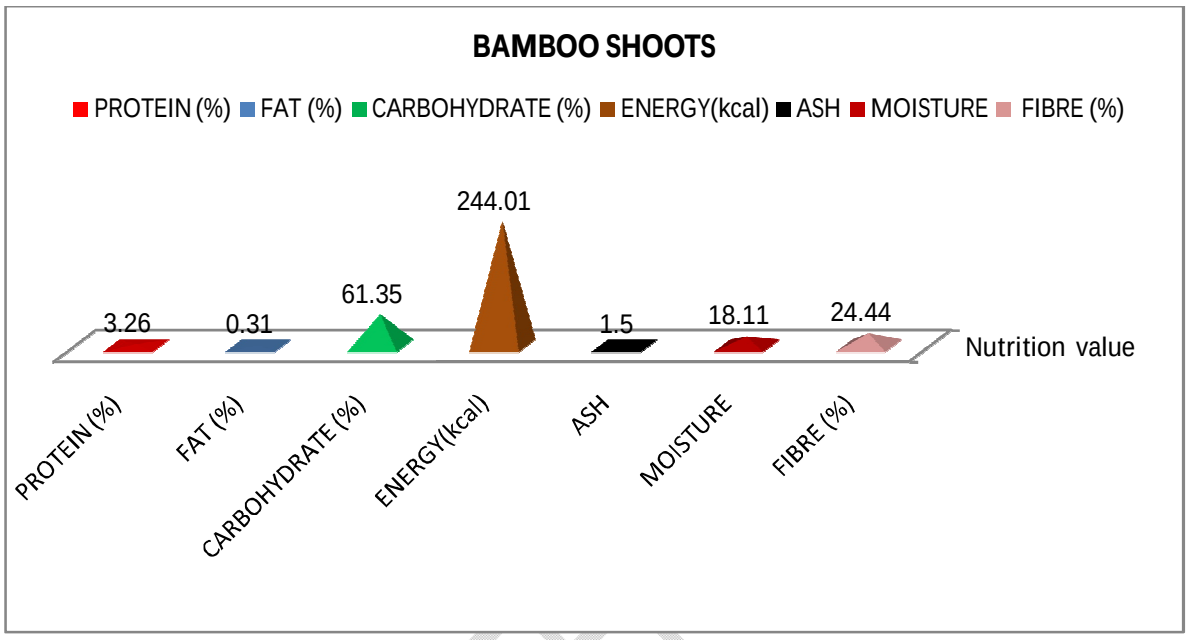
Graph: 1. proximate analysis of vegan honey

Proximate analysis graph 1 displays the result of proximate analysis of the vegan honey samples in percentage form, protein 1.77, fat 0.37, carbohydrate 74.02, and energy 306.49 kcal. Ash 1.48, moisture 22.36%

Table: 2. Tender bamboo shoots nutrition value/100gm

S. No.	Characters	Nutrition value
1.	PROTEIN (%)	3.26
2.	FAT (%)	0.31
3.	CARBOHYDRATE (%)	61.35
4.	ENERGY(kcal)	244.01

5.	ASH	1.50
6.	MOISTURE	18.11
7.	FIBRE (%)	24.44



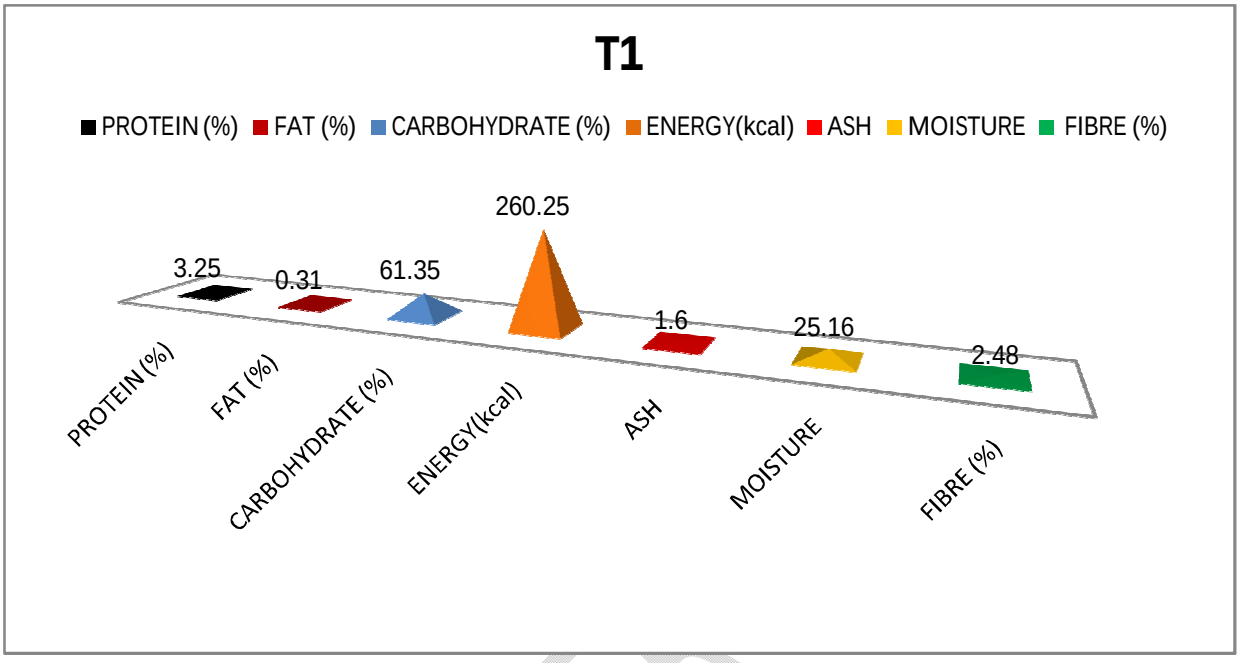
Graph: 2. Proximate analysis of tender bamboo shoots

Proximate analysis graph 2 displays the result of proximate analysis of the vegan honey samples in percentage form, protein 3.26, fat 0.31, carbohydrate 61.35, and energy 244.01 kcal. Ash 1.5, moisture 18.11 and fibre 24.44%

Table: 3. Vegan honey tender bamboo shoots murabba(T1) nutrition value/100gm

S. No.	Characters	Nutrition value
1.	PROTEIN (%)	3.25
2.	FAT (%)	0.31
3.	CARBOHYDRATE (%)	61.35
4.	ENERGY (kcal)	260.25
5.	ASH	1.60
6.	MOISTURE	25.16

7.	FIBRE (%)	2.48

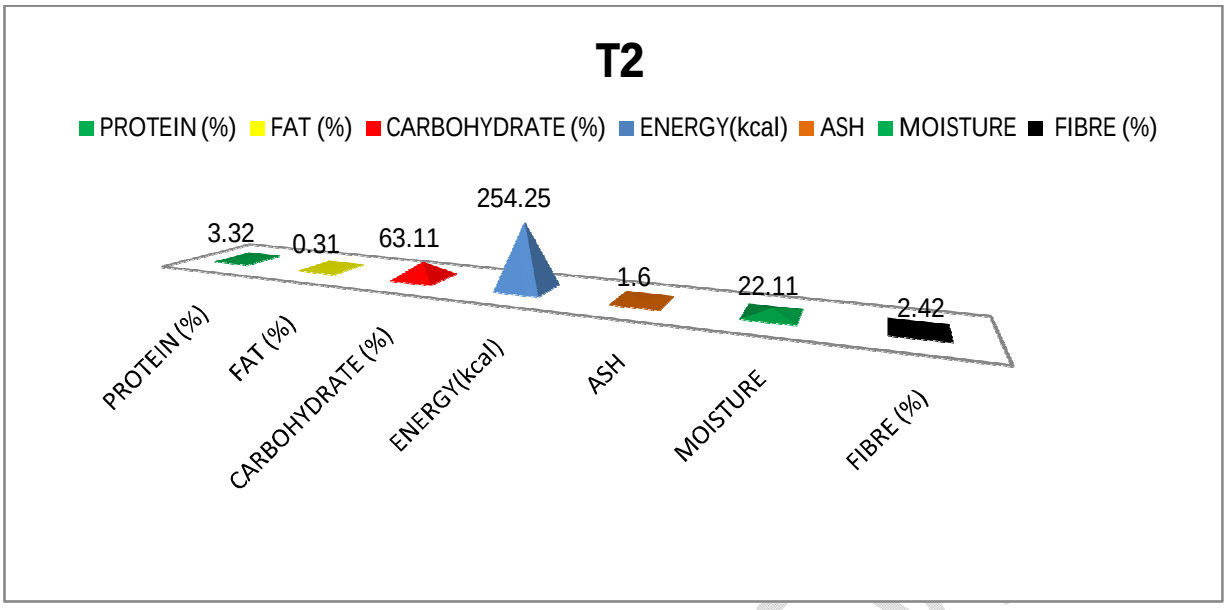


Graph: 3. proximateanalysis of vegan honey tender bamboo shoots murabba (T1)

Proximate analysis graph 3 displays the result of proximate analysis of the vegan honey samples in percentage form, protein 3.25, fat 0.31, carbohydrate 61.35, and energy 260.25 kcal. Ash 1.6, moisture 24.16 and fibre 2.48%.

Table: 4. Vegan honey tender bamboo shoots murabba (T2) nutrition value/100gm

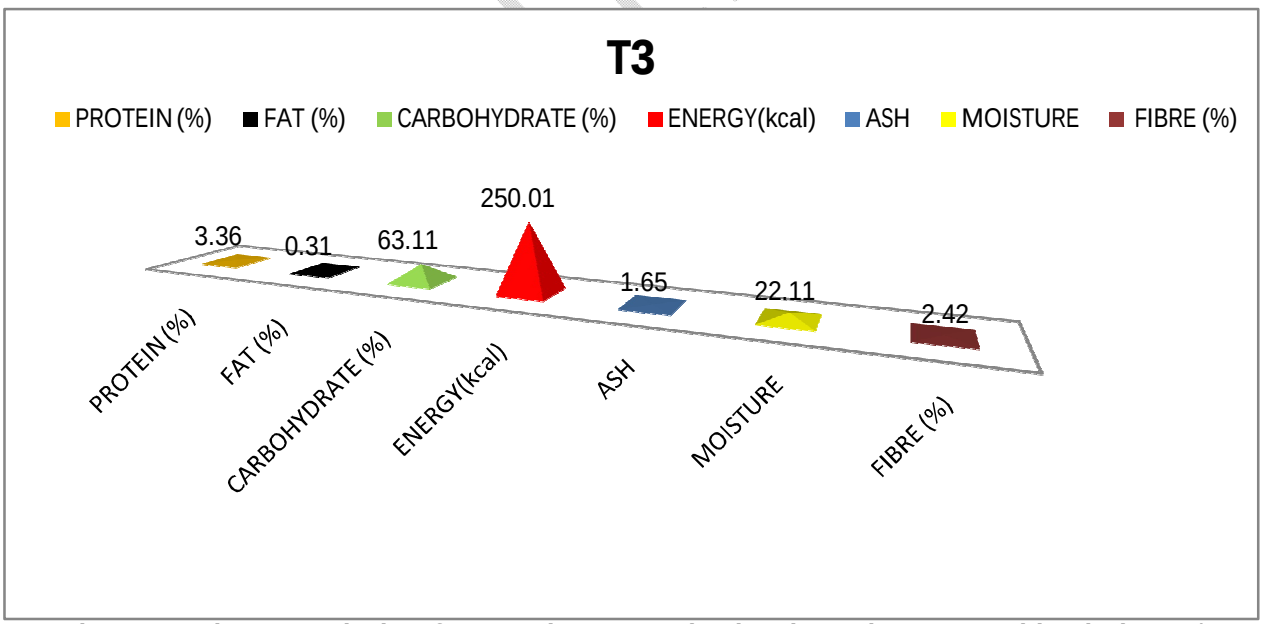
S. No.	Characters	Nutrition value
1.	PROTEIN (%)	3.32
2.	FAT (%)	0.31
3.	CARBOHYDRATE (%)	63.11
4.	ENERGY (kcal)	254.25
5.	ASH	1.60
6.	MOISTURE	22.11
7.	FIBRE (%)	2.42



Graph: 4. Proximate analysis of vegan honey tender bamboo shoots murabba (T2)

Proximate analysis graph.4 displays the result of proximate analysis of the vegan honey samples in percentage form, protein 3.32, fat 0.31, carbohydrate 63.11, and energy 254.25 kcal. Ash 1.6, moisture 22.11 and fibre 2.42%.

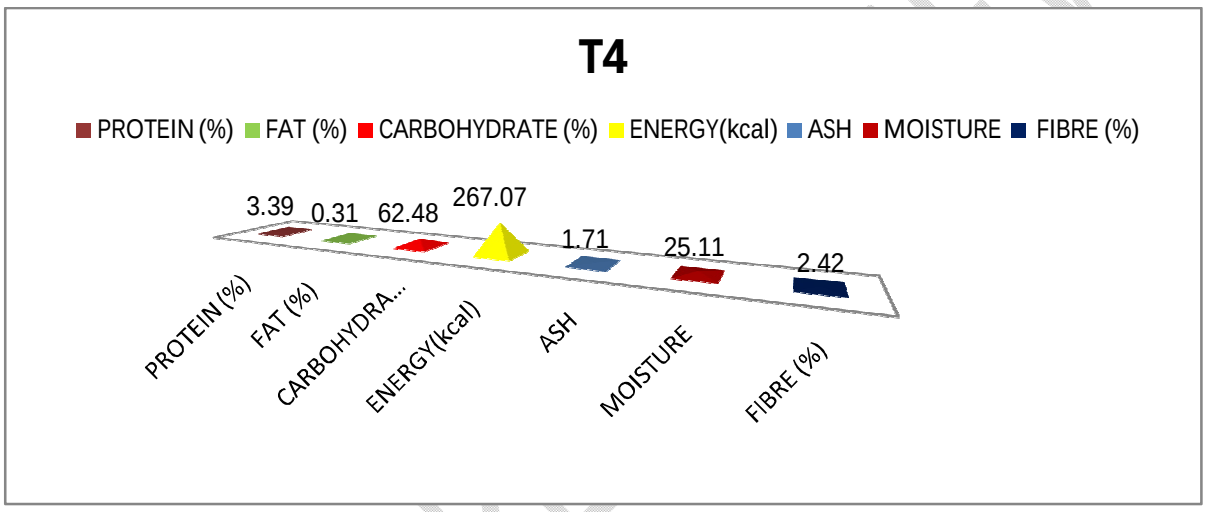
Table: 5. Vegan honey tender bamboo shoots murabba (T3) nutrition value/100gm



Graph: 5. Proximate analysis of vegan honey tender bamboo shoots murabba (T3) Proximate analysis graph 5 displays the result of proximate analysis of the vegan honey samples in percentage form, protein 3.36, fat 0.31, carbohydrate 63.11, and energy 250.01kcal Ash 1.65, moisture 22.11 and fibre 2.42%.

Table: 6. Vegan honey tender bamboo shoots murabba (T4) nutrition value/100gm

S. No.	Characters	Nutrition value
1.	PROTEIN (%)	3.39
2.	FAT (%)	0.31
3.	CARBOHYDRATE (%)	62.48
4.	ENERGY(kcal)	267.07
5.	ASH	1.71
6.	MOISTURE	25.11
7.	FIBRE (%)	2.42

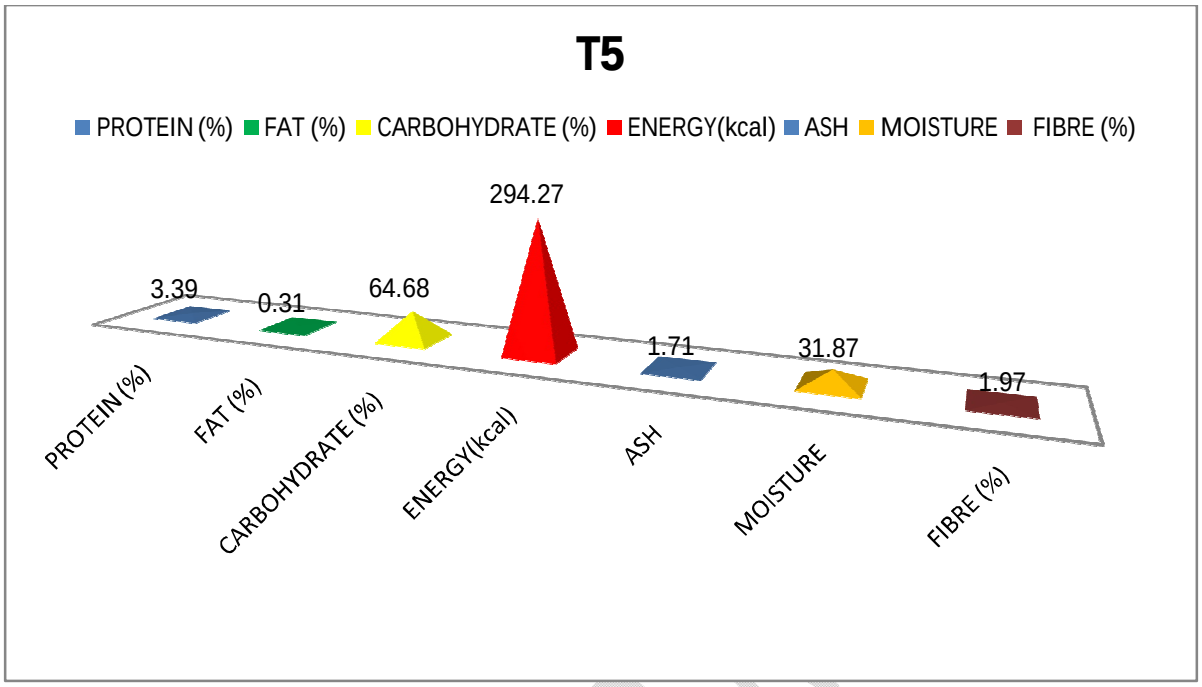


Graph: 6. Proximate analysis of vegan honey tender bamboo shoots murabba (T4)

Proximate analysis graph 6 displays the result of proximate analysis of the vegan honey samples in percentage form, protein 3.39, fat 0.31, carbohydrate 62.48, and energy 267.07 kcal. Ash 1.71, moisture 25.11 and fibre 2.42%.

Table: 7. Vegan honey tender bamboo shoots murabba (T5) nutrition value/100gm

S. No.	Characters	Nutrition value
1.	PROTEIN (%)	3.39
2.	FAT (%)	0.31
3.	CARBOHYDRATE (%)	64.68
4.	ENERGY(kcal)	294.27
5.	ASH	1.71
6.	MOISTURE	31.87
7.	FIBRE (%)	1.97

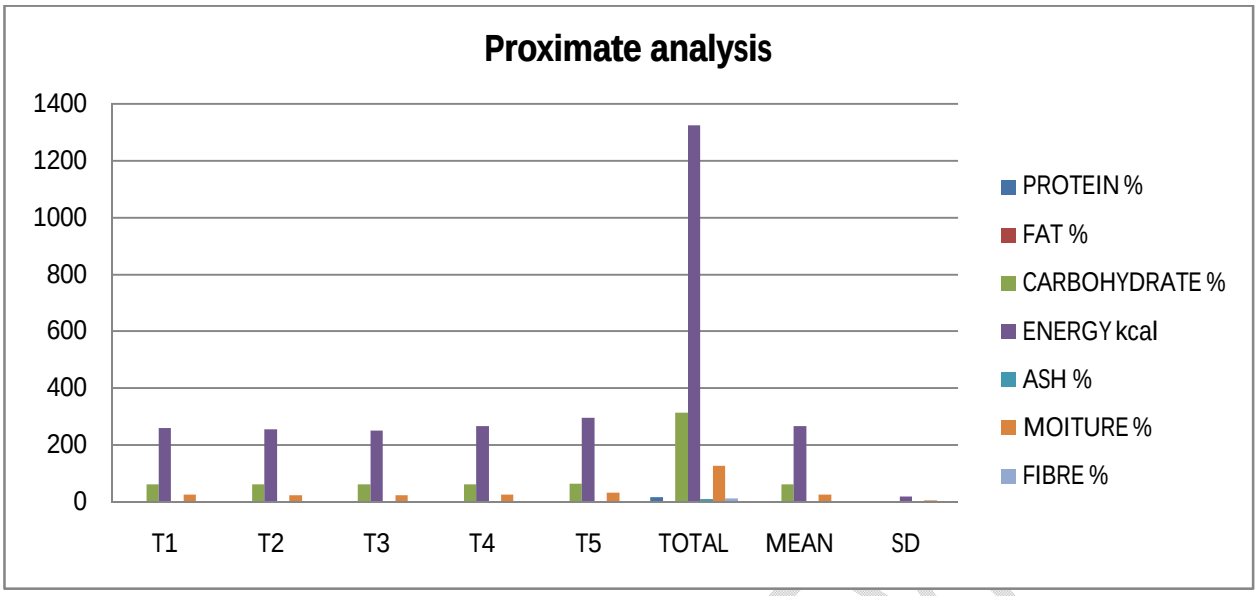


Graph: 7. Proximate analysis of vegan honey tender bamboo shoots murabba (T5)

Proximate analysis graph 7 displays the result of proximate analysis of the vegan honey samples in percentage form, protein 3.39, fat 0.31, carbohydrate 64.68%, and energy 294.27 kcal. Ash 1.71, moisture 31.87 and fibre 1.97%.

Table.8 Proximate analysis of vegan honey tender bamboo shoots murabba

SAMPLE	PROTEIN %	FAT %	CARBOHYDRATE %	ENERGY kcal	ASH %	MOITURE %	FIBRE %
T1	3.25	0.31	61.35	260.25	1.6	25.16	2.48
T2	3.32	0.31	63.11	254.25	1.6	22.11	2.42
T3	3.36	0.31	63.11	250.01	1.65	22.11	2.42
T4	3.39	0.31	62.48	267.07	1.71	25.11	2.42
T5	3.39	0.31	64.68	294.27	1.71	31.87	1.97
TOTAL	16.71	1.55	314.73	1325.85	8.27	126.36	11.71
MEAN	3.342	0.31	62.946	265.17	1.654	25.272	2.342
SD	0.0589	0.468	1.206	17.490	0.055	3.986	0.2095



Graph 8. proximate analyses

The bamboo shoot had relatively high fibre content (24.44%), a protein content (3.26%), and a low fat content (1.46%), energy (244.01 kcal), ash(1.50%), and moisture (18.11%) according to its approximate composition. Bamboo murabba Similar mean values for T1 were discovered to have 3.25% protein and 2.48% fibre, fat 0.31% carbohydrate 61.35%, energy 260.25 kcal, ash 1.60, moisture 25.16% followed by mean values for T5 with 3.39% protein and 1.97% fibre, fat 0.31%, carbohydrate 62.68%, energy 267.07 kcal., ash 1.75, moisture 31.87%. Means for fat percentage were found to be non-significantly different across all treatments.

4 CONCLUSION

In this study, vegan honey tender bamboo shoots murabba fruit were named for increasing their acceptance and market value, and to be used to produce new value-added goods. Fresh bamboo shoots murabba products were evaluated for their nutritional contents, protein, carbohydrate, energy, fat content, and antioxidant activity. Bamboo murabba has a considerable amount of dietary fibre (1.97%), protein (3.39%), and ash (1.71%), as well as calories (294.27 kcal.) and moisture content (31.87%). According to the findings of this study, bamboo shoots and bamboo murabba products are an excellent source of nutrients such as protein and other bioactive components. Because of its high nutritional value, bamboo shoots murabba can be easily incorporated into diets.

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