



ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; 12(1): 2924-2927
© 2023 TPI

www.thepharmajournal.com

Received: 01-11-2022

Accepted: 06-12-2022

Swati Shukla

Ph.D. Scholar, Food Science and Technology, WCDT, SHUATS, Prayagraj, Uttar Pradesh, India

Sandeep GM Prasad

Associate Professor, WCDT, SHUATS, Prayagraj, Uttar Pradesh, India

John David

Dean, WCDT, SHUATS, Prayagraj, Uttar Pradesh, India

Manisha Prasad

Assistant Professor, Lucknow Christian College, Lucknow, Uttar Pradesh, India

Sensory analysis of nutribar incorporated with legumes

Swati Shukla, Sandeep G M Prasad, John David and Manisha Prasad

Abstract

The goal of the current study project was to create nutribars that contained varied amounts of legumes. to assess the sensory qualities of nutribar that contains beans. According to sensory study, the control (T0) has an average rating (general acceptability) of 6.80. The therapy combination (T8) & (T0) has the best and lowest levels of overall acceptability (colour, flavour, appearance and body texture) quality compared to the other treatments, respectively. Because of treatments and replication, the ANOVA table up top shows that the F. Cal. Value is greater than the F. Tab. value at a 5% level of significance on each d.f. Additionally, the aforementioned table shows a significant difference ($p \leq 0.05$) between various therapies.

Keywords: Antioxidant, chickpea, human health, legumes, nutribar, tulsii

1. Introduction

Nutri-Composite Bar, a suitable and nutritious food Ready-to-eat foods that satisfy hunger and provide a balance of nutrients (protein, fat, minerals, vitamins, calories, and carbohydrates) (King, 2006; Ryland *et al.*, 2011; Wyatt, 2011) [4, 7, 11] is boosting sales indefinitely. Initially, Nutribar was promoted as a sports energy drink.

Most usually suggested for consumption by women (who are pregnant, nursing, or trying to get pregnant), Nutri bars are a common food with a combination of elements that work well to boost nutrition for all age groups. Nutri bar offers some medicinal qualities including demulcent, carminative, laxative, lactogenic, and rubefacient in addition to its intriguing nutritional qualities.

A notable summer-growing, short-season legume that is widely cultivated across the tropics and subtropics is the moong bean (*Vigna radiata* L.). The moong bean is a common food in certain nations, including Bangladesh, Pakistan, and India. The bean is a little, oblong bean that is high in fibre. When the husky moong bean is peeled, the green bean turns yellow. It aids in the treatment of food poisoning from a variety of sources, including mushrooms and herbal medicines. The moong bean aids with weight loss. Manganese, potassium, magnesium, folate, copper, zinc, and vitamin B sources are all present in good amounts. The moong bean is a substantial food that is starchy, high in protein, and contains fibre. It lowers blood pressure and cholesterol levels. The moong bean combats a number of chronic illnesses, including diabetes, cancer, heart disease, and obesity. The following nutrients can be found in one cup of cooked moong beans (percentages based on the RDAs for a typical adult female): 321 micrograms of folate (100%), 97 milligrammes of magnesium (36%), 0.33 milligrammes of vitamin B1 thiamine (36%), and 0.6 milligrammes of manganese (33%). This food contains 212 calories, 14 grammes of protein, 15 grammes of fibre, 1 gramme of fat, and 4 grammes of sugar. 7 milligrammes of zinc (24%) are included together with 55 milligrammes of calcium (5%), 0.13 milligrammes of vitamin B6 (11%), and 0.8 milligrammes of pantothenic acid (vitamin B5).

The chickpea, also known as chick pea, is an annual legume that belongs to the Fabaceae family and subfamily Faboideae. Its diverse varieties go by many names, including gramme, Bengal gramme, garbanzo, garbanzo bean, and Egyptian pea. Chickpeas are a nutrient-dense food that include a high amount of protein, dietary fibre, folate, and some dietary minerals, like iron and phosphorus, per 100 grammes (20% or higher of the Daily Value (El-Adawy, 2002). Magnesium, zinc, and vitamin B6 concentration is modest, supplying 10–16% of the DV. Proteins in cooked and germinated chickpeas are high in important amino acids including lysine, isoleucine, tryptophan, and total aromatic amino acids when compared to reference values defined by the World Health Organization and the United Nations Food and Agriculture Organization. 100 grammes of cooked chickpeas have 164 calories in them (690 kJ). 60% of cooked chickpeas are water, 27% are carbs, 9% are protein, and 3% are fat (table).

Corresponding Author:

Swati Shukla

Ph.D. Scholar, Food Science and Technology, WCDT, SHUATS, Prayagraj, Uttar Pradesh, India

Unsaturated fatty acids make up 5% of the lipid content, with linoleic acid making up 43% of the total fat (Jukanti *et al.*, 2012)^[3].

The soybean, often known as the soya bean, is an East Asian native species of legume that is commonly cultivated for its edible bean. The protein level of most beans is from 20 to 25%, whereas that of soybeans is around 40%. Soybeans are a good source of protein. Usually 18–20% of soybeans are made up of oil. About 30% of it is made up of carbohydrates. It has been demonstrated to lower risk of colon cancer and other disorders and includes a significant amount of dietary fibre (Mateos-Aparicio *et al.*, 2008)^[6]. Jaggery, also known as "Gur," is a pure, healthy, conventional, unprocessed, and full sugar produced by concentrating sugarcane juice devoid of any preservatives. One of the oldest sweeteners known to man is jaggery, which is a staple of the rural diet in many nations (Mandal *et al.*, 2006)^[5]. Jaggery's colour ranges from pale golden to dark golden to light brown. Circilinol, Circimartin, Isothymusin, Apigenin, and Rosameric Acid are antioxidants due to their ability to scavenge free radicals (Tewari *et al.*, 2021)^[8] found in Tulsi leaves (Verma, 2016).^[10] People are becoming more health conscious today, and as a result, they prefer items with additional value because they have more nutritional content. Flavonoids and caffeic acid are among the antioxidants present in sprouted moong beans. It lowers levels of harmful LDL cholesterol, lowers heart disease, and is rich in potassium, magnesium, and fibre, which may lower blood pressure. The folate in moong beans helps to promote a healthy pregnancy and boosts a baby's metabolism and immunity.

One of the plentiful and reasonably priced sources of protein is the soybean. The soybean is a common ingredient in the diets of both people and animals in many parts of the world. Because soybeans have no carbohydrates, they are an excellent source of protein for diabetics. Soybean seeds include 50% protein, 63% meal, and 17% oil. Protein is plentiful in chickpeas. It controls blood sugar levels, regulates weight, improves digestion, and guards against chronic illnesses like diabetes, cancer, and heart disorders. Tulsi leaves have the antioxidant properties such as circilineol, circimartin, isothymusin, apigenin and rosameric acid. Nutribars, commonly referred to as nutrition bars, have many advantages. In India, Tulsi is the oldest traditional medicinal plant, which has broad beneficial effects on human health for preventing viral fever and cough etc. (Tewari *et al.*, 2020)^[9].

In the beginning, they are quite practical and compact enough to fit into a desk drawer, gym bag, handbag, backpack, or the glove box of a car. Second, the majority of nutribars are fortified significantly with calcium, sources of protein comparable to a small chicken breast, vitamins and minerals (exactly like a bowl of breakfast cereal), and fibre. For a quick, on-the-go lunch or snack, they are unquestionably a much better option than a candy bar, box of cookies, or bag of chips from a vending machine. Jaggery helps to reduce joint pain, cleanse the blood, increase immunity, prevent anaemia, control blood pressure, and avoid constipation. It works well as a binding agent as well.

This present research work was carried out to prepare nutribar incorporated with different ratios of legumes. To evaluate the sensory attributes of nutribar incorporated with legumes.

2. Material and Methods

The experiment 'Studies on development of nutribar

incorporated with legumes' was carried out in research laboratory of Warner college of dairy technology from Sam Higginbottom University of Agriculture, Technology & Science, Prayagraj.

2.1 Selection of ingredients

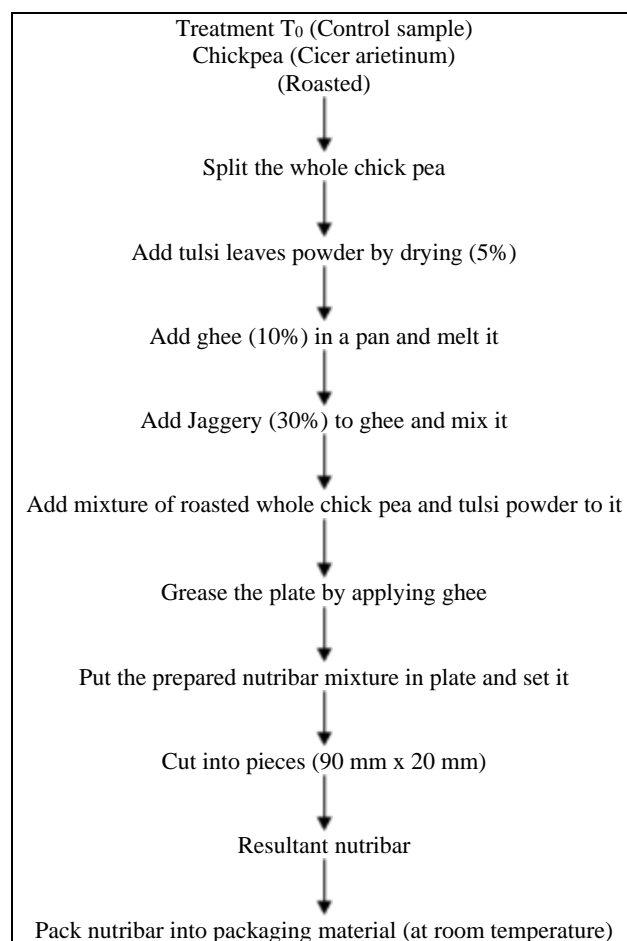
Sprouted whole moong bean, roasted chick pea, sprouted soya bean, jaggery, ghee, tulsi leaves will be procured from the local market of Prayagraj.

2.2 Preparation of raw material

Selection of moong beans, soybean, and, chick pea, clean the three legumes, then soaking process will be start moong beans for (8 hrs at room temperature),soybean for (24 hrs at room temperature),chickpea for (8 hrs at room temperature) then drain the excess water of moong beans and soybean, and surface drying for chick pea, then germinate the moong bean and soybean for 24 hrs at room temperature, and for chick pea roasting process will be done at 250 degree C(1-2 Min).The whole moong bean, soya bean, chick pea will be roasted separately, Then the tulsi leaves will be dried in a drier for 4 hours and made into a powder.

The sprouted whole moong bean, soya bean, chick pea, tulsi leaves will be mixed properly in a bowl. Then ghee is added in a pan, add crushed jaggery into the pan. After melting the jaggery add all the ingredients which will be mixed in a bowl and roasted, mix it properly till the mixture become thick. After that on the plate apply the ghee and grease it and put the mixture on it and keep it for set in room temperature and cut into a desire piece with the help of moulder.

Plan of work



Treatment T₁ to T₁₂

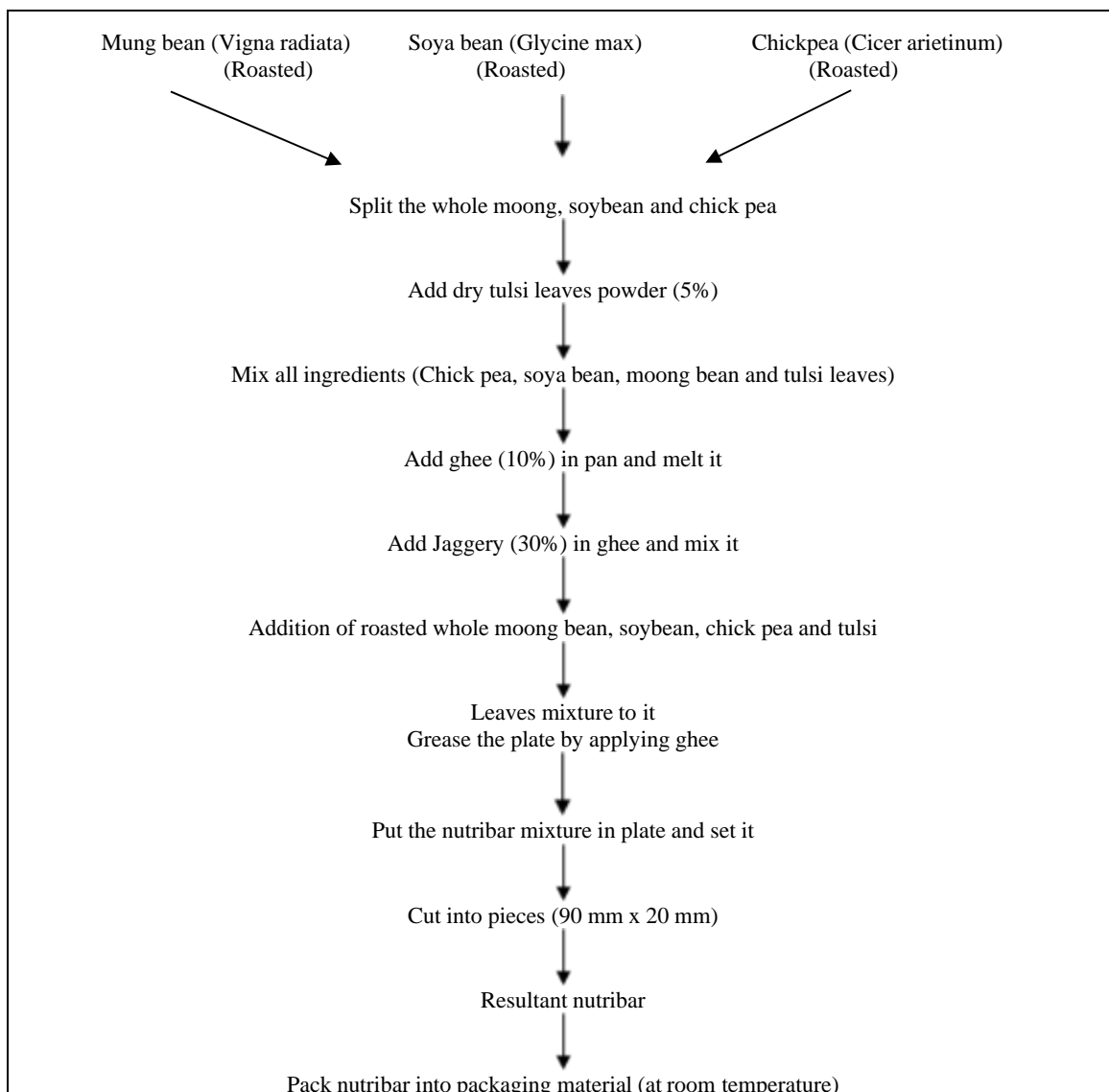


Table 1: Treatment Combination

Treatment	Composition of different Legumes (%)		
	Mung bean	Soyabean	Chickpea
T ₁	85	10	5
T ₂	80	15	5
T ₃	75	20	5
T ₄	70	25	5
T ₅	80	10	10
T ₆	75	15	10
T ₇	70	20	10
T ₈	65	25	10
T ₉	75	10	15
T ₁₀	70	15	15
T ₁₁	65	20	15
T ₁₂	60	25	15

No. of treatments: 12+1
 No. of replications: 5
 No. of sample:65

2.4 Sensory Evaluation

The nutribar was evaluated for sensory attributes by semi-trained panel by using 9- point Hedonic scale.

3. Statistical Analysis

The data obtained was statistically analysed by using factorial design and critical difference (C.D.) techniques (Imran and Coover, 1983)^[2].

Table 2: Table showing total overall acceptability quality of final prepared Nutribar

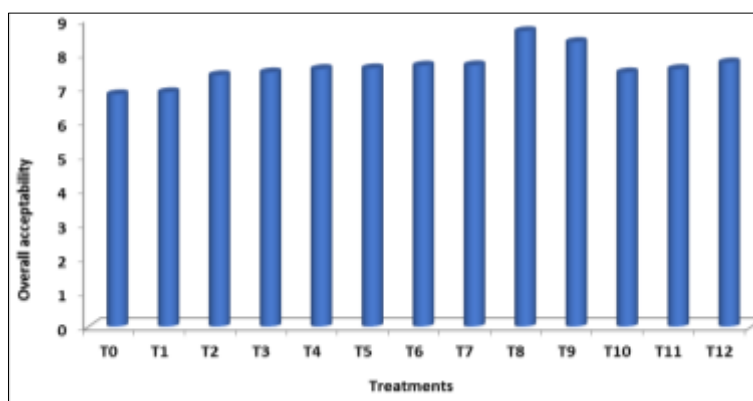
Treatments	R1	R2	R3	R4	R5	Mean
T ₀	7.47	6.32	7.09	5.91	7.21	6.80
T ₁	7.85	6.31	7.63	5.91	6.60	6.86
T ₂	6.81	8.35	6.41	7.10	8.13	7.36
T ₃	8.78	6.48	8.02	5.66	8.26	7.44
T ₄	8.76	7.07	7.78	6.91	7.18	7.54
T ₅	8.11	6.57	8.51	7.82	6.79	7.56
T ₆	8.31	7.16	7.93	6.75	8.05	7.64
T ₇	8.64	7.10	8.42	6.70	7.39	7.65
T ₈	8.10	9.64	7.70	8.39	9.42	8.65
T ₉	9.67	7.37	8.91	6.55	9.15	8.33
T ₁₀	8.66	5.97	8.68	6.81	7.08	7.44
T ₁₁	8.09	6.55	8.49	7.80	6.77	7.54
T ₁₂	9.07	6.77	8.31	5.95	8.55	7.73
Mean	8.33	7.05	7.99	6.79	7.74	7.58
Minimum	6.81	5.97	6.41	5.66	6.60	6.80
Maximum	9.67	9.64	8.91	8.39	9.42	8.65
F- test			S			
S. Ed. (±)			0.479			
C. D. (P = 0.05)			0.956			

The above table is showing that the mean value of control (T₀) is 6.80. The above table also showing that treatment combination (T₈) & (T₀) contains highest and lowest overall acceptability (colour, flavour, appearance and body texture) quality level than the other treatments respectively.

Table 3: Table showing ANOVA for overall acceptability quality content (%) in final prepared Nutribar

ANOVA						
Source	d. f.	S.S.	M.S.S.	F. Cal.	F. Tab. 5%	Result
Replication	4	21.6414	5.4104	9.420	2.57	S
Treatment	12	14.7820	1.2318	2.145	1.96	S
Error	48	27.5694	0.5744	-	-	-
Total	64	63.9928	-			-

The above ANOVA table is showing that the F. Cal. Value is higher than the F. Tab. value at 5% significant level on their respective d.f. due to replication & treatments. The above table also showing significant difference ($p \leq 0.05$) between different treatments.

**Fig 1:** Graphical representation of overall acceptability quality content (%) in final prepared Nutribar

4. Conclusion

Following sensory research, it was shown that control (T₀) has a mean value (overall acceptability such as colour, flavour, appearance and body texture) 6.80. As compared to the other treatments, the treatment combination (T₈) & (T₀) has the highest and lowest overall acceptability quality level, respectively. The ANOVA table up top demonstrates that the F. Cal. Value surpasses the F. Tab. value at a 5% level of significance on each d.f. because of treatments and replication. The aforementioned table likewise demonstrates a significant distinction ($p \leq 0.05$) between various treatments.

5. References

1. El-Adawy TA. Nutritional composition and antinutritional factors of chickpeas (*Cicer arietinum* L.) undergoing different cooking methods and germination. *Plant Foods for Human Nutrition*. 2002;57(1):83-97.
2. Imran RL, Coover WB. *Statistical analysis. A modern approach to statistics*. 2nd ed. New York; c1983. p. 120.
3. Jukanti AK, Gaur PM, Gowda CLL, Chibbar RN. Nutritional quality and health benefits of chickpea (*Cicer arietinum* L.): A review. *British Journal of Nutrition*. 2012;108(S1):S11-S26.
4. King J. Nutrition bar update. *Nutraceuticals World*. 2006;9(1):32-36.
5. Mandal D, Bolander ME, Mukhopadhyay D, Sarkar G, Mukherjee P. The use of microorganisms for the formation of metal nanoparticles and their application. *Applied microbiology and biotechnology*. 2006;69(5):485-492.
6. Mateos-Aparicio I, Cuenca AR, Villanueva-Suárez MJ, Zapata-Revilla MA. Soybean, a promising health source. *Nutricion hospitalaria*. 2008;23(4):305-312.
7. Ryland LK, Fox TE, Liu X, Loughran TP, Kester M. Dysregulation of sphingolipid metabolism in cancer. *Cancer biology & therapy*. 2011;11(2):138-149.
8. Tewari S, Agarwal RK, Sitaram SK, Nakhale S. The Pharma Therapeutic Fruits: An Overview. *Journal of Pharmaceutical Research International*. 2021;33(38A):132-142.
9. Tewari S, David J, David B. A critical review on immune-boosting therapeutic diet against Coronavirus (COVID-19). *J Sci Technol*. 2020;5(5):43-49.
10. Verma S. Chemical constituents and pharmacological action of *Ocimum sanctum* (Indian holy basil-Tulsi). *The Journal of Phytopharmacology*. 2016;5(5):205-207.
11. Wyatt LG. Nontraditional student engagement: Increasing adult student success and retention. *The Journal of Continuing Higher Education*. 2011;59(1):10-20.