



ISSN (E): 2277-7695

ISSN (P): 2349-8242

TPI 2024; 13(8): 85-88

© 2024 TPI

www.thepharmajournal.com

Received: 08-06-2024

Accepted: 15-07-2024

Bhosale Shubham

M.Sc. Student,
Department of Animal
Husbandry and Dairy Science,
College of Agriculture Dapoli,
Dr. B.S.K.K.V., Dapoli,
Maharashtra, India

Dr. Sandip S Ramod

Assistant Professor,
Department of Animal
Husbandry and Dairy Science,
College of Agriculture, Dr.
B.S.K.K.V., Dapoli,
Maharashtra, India

Dr. Vijay B Kadav

Assistant Professor,
Department of Animal
Husbandry and Dairy Science,
College of Agriculture, Dr.
B.S.K.K.V., Dapoli,
Maharashtra, India

Dr. Narendra N Prasade

Associate Professor,
Department of Animal
Husbandry and Dairy Science,
College of Agriculture, Dr.
B.S.K.K.V., Dapoli,
Maharashtra, India

Dr. Ranjit P Mahadik

Assistant Professor, Department
of Extension Education, College
of Agriculture, Dr. B.S.K.K.V.,
Dapoli, Maharashtra, India

Corresponding Author:

Dr. Sandip S Ramod

Assistant Professor,
Department of Animal
Husbandry and Dairy Science,
College of Agriculture, Dr.
B.S.K.K.V., Dapoli,
Maharashtra, India

Study on physico-chemical properties and production Cost of milk shake blended with marking nut (*Semecarpus anacardium*) powder

Bhosale Shubham, Dr. Sandip S Ramod, Dr. Vijay B Kadav, Dr. Narendra N Prasade and Dr. Ranjit P Mahadik

Abstract

In the present study the milk shake was prepared from cow milk by incorporation of marking nut powder and sugar at different levels *viz.* 7.5, 10, 12.5 and 15 percent marking nut powder and 8 and 10 percent sugar in different combinations. From the result of present investigation, it may be concluded that marking nut powder and sugar could be successfully utilized for preparation of milk shake. The most acceptable quality milk shake can be prepared by using 12.5 percent marking nut powder and 10 percent sugar (S₂M₃). The most acceptable quality milk shake (S₂M₃) contained on an average, 28.84 percent total solids, 6.16 percent fat, 5.25 percent protein, 15.25 percent total sugar and 0.194 percent Titratable acidity. The most optimum level found during research was subjected for microbial analysis. The microbial parameters were standard plate count, Coliform count and E- coli. The most optimum level was subjected to sensory evaluation also on 0, 5, 10, 15 days of storage. The results pertaining to microbial evaluation of most acceptable level of milk shake at various time intervals are presented. The studies on shelf life indicate that most acceptable level of milk shake remains in good edible condition up to ten days at refrigerated conditions.

Keywords: Milkshake, marking nut (*Semecarpus anacardium*) powder, total solids, fat content, protein content, titratable acidity and total sugar

Introduction

Several types of milk shakes are sold in the market i.e. banana milk shake, mango milk shake, sapota milk shake, almond milk shake, fig milk shake, custard apple milk shake and the method of manufacture of milk shake vary from region to region. The Marking Nut (*Semecarpus anacardium* L.) is a well-known medicinal plant belonging to the family Anacardiaceae. Research shows that the marking nut is rich in bioflavonoids, vitamins, minerals and amino acids. The marking nut is claimed to be effective in different diseases including arthritis, cancer, various infections and many more. It has earned a vital role in medicinal herbs that helps in treating many diseases. A large number of herbal preparations are done by this tree. Ramprasath *et al.* (2005) [4]. The immune-modulatory potency, anti-oxidative, membrane stabilizing, tumors marker regulative, glucose level restoring and mineral regulation properties of marking nut. Premlatha *et al.* (2000) [3]. The marking nut is a good source of nutrients like carbohydrates, protein, calcium, phosphorous and also other minerals. The marking nuts of *Semecarpus anacardium* show various medicinal properties as they are rich in various medicinal properties and also rich in various biologically active compounds. Phytochemical analyses of *Semecarpus anacardium* nut shows that its nut contains a variety of biologically active compounds such as bioflavonoids, phenolic compounds, bhlawanols, minerals, vitamins and amino acids, which shows various medicinal properties. Traditional healers and physicians use *Semecarpus anacardium* in their clinical practice. Several experiments have proved its anti-atherogenic, anti-inflammatory, antioxidant, anti-microbial, anti-reproductive, CNS stimulant, hypoglycemic, anti-carcinogenic and hair growth promoter activities. Jain and Sharma (2013) [2].

Materials and Methods

The study entitled "Preparation of milk shake blended with marking nut (*Semecarpus anacardium* L.) powder" was carried out at the Department of Animal Husbandry and Dairy Science, College of Agriculture, Dapoli, Dist.-Ratnagiri during the year 2020-2021.

Fresh cow milk was procured from Experimental Dairy Farm, Department of Animal Husbandry and Dairy Science, College of Agriculture, Dapoli. Marking Nut (Godambi) & Sugar was purchased from local market at Dapoli.

Milk shake preparation

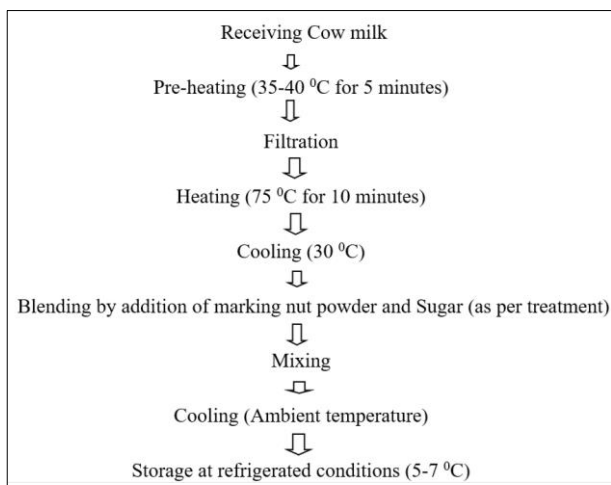


Fig 1: Flow diagram

Treatments

Levels of marking nut powder



Fig 2: Marking nut (*Semecarpus anacardium L.*)

- M₁**-7.5 percent of milk (w/v).
- M₂**- 10 percent of milk (w/v).
- M₃**- 12.5 percent of milk (w/v).
- M₄**- 15 Percent of milk (w/v).

Levels of Sugar

- S₁**- 8 percent of milk (w/v).
- S₂**- 10 percent of milk (w/v).

Eight treatment combinations as stated below

- **S₁M₁**: 8 percent sugar and 7.5 percent marking nut powder
- **S₁M₂**: 8 percent sugar and 10 percent marking nut powder
- **S₁M₃**: 8 percent sugar and 12.5 percent marking nut powder
- **S₁M₄**: 8 percent sugar and 15 percent marking nut powder
- **S₂M₁**: 10 percent sugar and 7.5 percent marking nut

- powder
- **S₂M₂**: 10 percent sugar and 10 percent marking nut powder
- **S₂M₃**: 10 percent sugar and 12.5 percent marking nut powder
- **S₂M₄**: 10 percent sugar and 15 percent marking nut powder



Fig 3: Delicious and nutritious milk shake

Results and Discussion

Physico-Chemical analysis of milk shake

Total Solids

Table 1: Effect of different levels of marking nut powder and Sugar on Total solids content of milk shake (%)

	R-I	R-II	R-III	R-IV	R-V	R-VI	Mean
S ₁ M ₁	24.73	24.71	24.76	24.78	24.75	24.72	24.74
S ₁ M ₂	26.21	26.24	26.22	26.27	26.23	26.25	26.24
S ₁ M ₃	27.61	27.63	27.65	27.66	27.68	27.62	27.64
S ₁ M ₄	28.97	28.93	28.91	28.95	28.92	28.98	28.94
S ₂ M ₁	26.01	26.05	26.03	26.07	26.04	26.02	26.04
S ₂ M ₂	27.44	27.41	27.46	27.43	27.47	27.45	27.44
S ₂ M ₃	28.81	28.83	28.85	28.87	28.82	28.84	28.84
S ₂ M ₄	30.11	30.14	30.16	30.17	30.19	30.12	30.15
Mean	27.49	27.49	27.51	27.53	27.51	27.50	27.50

The result presented in Table 1 indicate that irrespective of levels of marking nut, total solids content in milk shake varied significantly among different levels of sugar. The total solids content gradually increased from 24.74 to 30.15 percent with rising levels of marking nut powder. The highest total solids content was noticed in 15 percent level of marking nut powder and 10 percent sugar of milk shake.

Fat

Table 2: Effect of different levels of marking nut powder and sugar on fat content of milk shake (%)

	R-I	R-II	R-III	R-IV	R-V	R-VI	Mean
S ₁ M ₁	5.46	5.42	5.43	5.41	5.47	5.45	5.44
S ₁ M ₂	5.88	5.85	5.83	5.87	5.81	5.84	5.85
S ₁ M ₃	6.28	6.25	6.23	6.21	6.26	6.29	6.25
S ₁ M ₄	6.66	6.63	6.61	6.64	6.67	6.65	6.64
S ₂ M ₁	5.32	5.34	5.36	5.38	5.35	5.39	5.36
S ₂ M ₂	5.78	5.79	5.74	5.72	5.76	5.71	5.75
S ₂ M ₃	6.17	6.14	6.16	6.13	6.15	6.18	6.16
S ₂ M ₄	6.56	6.51	6.53	6.57	6.52	6.58	6.55
Mean	6.014	5.991	5.986	5.991	5.999	6.011	6.00

The above data revealed that the variation in the fat content of milk shake due to different levels of marking nut powder was highly significant. The fat content increased with the increase in the level of marking nut powder. This is due to fat content of marking nut powder (25.2 percent). As in the present study the milk shake prepared from cow milk blended with marking nut powder, it ultimately contained 5.44 to 6.55 percent fat.

Protein

Table 3: Effect of different levels of marking nut powder and sugar on protein content of milk shake (%)

	R-I	R-II	R-III	R-IV	R-V	R-VI	Mean
S ₁ M ₁	4.51	4.53	4.56	4.54	4.52	4.55	4.54
S ₁ M ₂	4.91	4.94	4.95	4.92	4.96	4.93	4.94
S ₁ M ₃	5.28	5.26	5.22	5.21	5.27	5.29	5.26
S ₁ M ₄	5.65	5.61	5.64	5.62	5.66	5.68	5.64
S ₂ M ₁	4.44	4.42	4.46	4.43	4.48	4.41	4.44
S ₂ M ₂	4.83	4.84	4.88	4.82	4.86	4.85	4.85
S ₂ M ₃	5.25	5.24	5.26	5.22	5.27	5.28	5.25
S ₂ M ₄	5.56	5.52	5.57	5.54	5.51	5.59	5.55
Mean	5.05	5.05	5.07	5.04	5.07	5.07	5.06

The observations of Table 3 indicate that addition of marking nut powder resulted in significant increase in protein content of milk shake from 4.54 percent at 7.5 percent to 5.55 percent at 15 percent level of marking nut powder. The increase in the protein content of milk shake with the addition of marking nut powder could be attributed to its higher amount of protein content (23.1 percent) as compared to the cow milk protein (3.49 percent) Protein content of milk shake increased with the increase in the level of marking nut with the values of 4.54, 4.94, 5.26 and 5.64 percent at 7.5, 10, 12.5 and 15 percent of marking nut powder and 8 percent of sugar, respectively.

Acidity

Table 4: Effect of different levels of marking nut powder and sugar on acidity of milk shake (% L.A.)

	R-I	R-II	R-III	R-IV	R-V	R-VI	Mean
S ₁ M ₁	0.171	0.172	0.173	0.169	0.172	0.168	0.171
S ₁ M ₂	0.183	0.185	0.188	0.182	0.184	0.189	0.185
S ₁ M ₃	0.195	0.192	0.194	0.197	0.193	0.196	0.195
S ₁ M ₄	0.206	0.203	0.201	0.207	0.205	0.204	0.204
S ₂ M ₁	0.167	0.165	0.162	0.166	0.169	0.163	0.165
S ₂ M ₂	0.182	0.181	0.184	0.187	0.185	0.186	0.184
S ₂ M ₃	0.191	0.193	0.196	0.192	0.194	0.197	0.194
S ₂ M ₄	0.203	0.202	0.204	0.207	0.209	0.205	0.205
Mean	0.187	0.187	0.188	0.188	0.189	0.189	0.188

The results from table 4 indicate that the titratable acidity of milk shake varied from 0.171 to 0.205 percent lactic acid irrespective of various treatment combinations. The mean titratable acidity of milk shake was 0.188 percent. The acidity of milk shake increased simultaneously with the increase in the level of marking nut powder. There was slight increase in the acidity of milk shake due to increasing levels of marking nut powder and sugar. The lowest acidity (0.165 percent) was recorded at 7.5 percent level of marking nut powder. Whereas highest (0.205 percent) at 15 percent level of marking nut powder.

Total sugar

Table 5: Effect of different levels of marking nut powder and sugar on total sugar of milk shake (%)

	R-I	R-II	R-III	R-IV	R-V	R-VI	Mean
S ₁ M ₁	13.01	13.03	13.02	13.07	13.04	13.06	13.04
S ₁ M ₂	13.44	13.41	13.45	13.47	13.46	13.48	13.45
S ₁ M ₃	13.86	13.82	13.84	13.88	13.81	13.85	13.84
S ₁ M ₄	14.26	14.24	14.22	14.25	14.27	14.29	14.26
S ₂ M ₁	14.49	14.46	14.43	14.42	14.45	14.48	14.46
S ₂ M ₂	14.89	14.86	14.85	14.81	14.84	14.83	14.85
S ₂ M ₃	15.27	15.25	15.23	15.28	15.21	15.24	15.25
S ₂ M ₄	15.63	15.61	15.65	15.67	15.62	15.68	15.64
Mean	14.36	14.34	14.34	14.36	14.34	14.36	14.35

The total sugar content in milk shake showed gradual increase from 13.04 to 15.64 percent with the increasing levels of marking nut powder. The increase in sugar content of milk shake may be due to the higher amount of total sugar content in marking nut powder (33.45 percent). The values reported by above said worker for total sugar content in golden milk shake, custard apple milk shake and ramphal milk shake are more or less similar to the values observed during preparation of milk shake blended with marking nut powder. The sugar levels also showed significant variation in sugar content of milk shake. The total sugar content of milk shake at 8 and 10 percent level of sugar and 7.5 percent marking nut was 13.04 and 14.46 percent, respectively. In present investigation the total sugar content of milk shake increased with the increase in the level of marking nut powder and sugar. Bhosale (2013) [5] reported the same increasing trend in the ramphal milk shake.

Cost of production of milk shake
The effect of different levels of marking nut powder and sugar on production cost of milk shake

Table 6: Production cost of milk shake per kg in Rs. (based on cost of ingredients only)

Ingredients	Rate	Treatments															
		S ₁ M ₁		S ₁ M ₂		S ₁ M ₃		S ₁ M ₄		S ₂ M ₁		S ₂ M ₂		S ₂ M ₃		S ₂ M ₄	
		Qty (g.)	Cost (Rs.)	Qty (g.)	Cost (Rs.)	Qty (g.)	Cost (Rs.)	Qty (g.)	Cost (Rs.)	Qty (g.)	Cost (Rs.)	Qty (g.)	Cost (Rs.)	Qty (g.)	Cost (Rs.)	Qty (g.)	Cost (Rs.)
Milk (/Lit)	50 /-	100	5	100	5	100	5	100	5	100	5	100	5	100	5	100	5
Sugar (/Kg)	38 /-	8	0.30	8	0.30	8	0.30	8	0.30	10	0.38	10	0.38	10	0.38	10	0.38
Marking nut (/Kg)	1375 /-	7.5	10.31	10	13.75	12.5	17.18	15	20.62	7.5	10.31	10	13.75	12.5	17.18	15	20.62
Cost of ingredients			15.61/-		19.05		22.48		25.92		15.69		19.13		22.56		26.00
Total quantity of milkshake prepared (g)		115.5		118		120.5		123		117.5		120		122.5		125	
Cost of milk shake/100 gm			13.51		16.52		18.65		21.07		13.35		15.94		18.41		20.8
Total cost of milkshake/kg			135.1		165.2		186.5		210.7		133.5		159.4		184.1		208

The preparation cost of milk shake was worked out by considering the prevailing retail cost of ingredients used only. From the Table 6. it is seen that the treatment combination S₂M₁, i.e. marking nut powder 7.5 percent and sugar 10 percent. produced milk shake with lowest cost of Rs. 133.5 per kg.

Whereas highest cost of milk shake Rs. 210.7 was observed for treatment S₁M₄ i.e. 15 percent marking nut powder and 8 percent sugar

Conclusion

From the results of the present investigation, it may be concluded that marking nut and sugar could be successfully utilized for the preparation of milk shake. The most acceptable quality milk shake prepared by 10 percent sugar and 12.5 percent marking nut powder scored highest points (7.70). The most acceptable quality milk shake (S₂M₃) contained on an average, 28.84 percent total solids, 6.16 percent fat, 5.25 percent protein, 15.25 percent total sugar and 0.194 percent titratable acidity. Production cost of most acceptable quality milk shake (S₂M₃) was ₹ 184.01 per kg.

References

1. AOAC. Official methods of analysis. 12th ed. Washington, D.C.: Association of Official Analytical Chemists; c1995.
2. Jain P, Sharma HP. A potential ethnomedicinal plant: *Semecarpus anacardium* Linn. - A review. Int J Res Pharm Chem. 2013;3(3):2231-2781.
3. Premalatha B, Sachdanandam P. Potency of *Semecarpus anacardium* L. nut milk extract against aflatoxin B(1)-induced hepatocarcinogenesis: Reflection on microsomal biotransformation. Pharmacol Res. 2000;42:161-166.
4. Ramprasath VR, Shanthi P, Sachdanandam P. *Semecarpus anacardium* L. nut milk extract, an indigenous drug preparation, modulates reactive oxygen/nitrogen species levels and antioxidative system in adjuvant arthritic rats. Mol Cell Biochem. 2005;276:97-104.
5. Bhosale KS. Utilization of *Ramphal* (*Annona reticulata* L.) pulp in the preparation of milk shake. [M.Sc. thesis]. Parbhani: Vasant Rao Naik Marathwada Krishi Vidyapeeth; c2013.