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Studies on sensory properties of barnyard millet (*Echinochloa esculenta*) kheer

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Abstract

The research work entitled “Studies on preparation of barnyard millet (*Echinochloa esculenta*) kheer” was undertaken during the year 2023-2024 at Department of Animal Husbandry and Dairy Science, College of Agriculture, Vasantrao Naik Marathwada Krishi Vidyapeeth Parbhani, Maharashtra With the aim to standardize process of preparation of barnyard millet *kheer*. After preliminary trials 4 levels viz. 1.5, 2.5, 3.5 and 4.5 per cent i.e. T₁, T₂, T₃, and T₄ respectively were selected to add barnyard millet. Four levels were compared to control and a result obtained was statistically analyzed to arrive at a suitable conclusion. The T₁ *kheer* rated highest score for colour and appearance (8.75), and overall acceptability (8.75) and highest score for flavour (9.00) with 1.5 per cent barnyard millet. Barnyard millet *kheer* was evaluated for cost of production of 1 kg *kheer* for treatments T₀, T₁, T₂, T₃, and T₄ were 93.44, 93.54, 93.94, 94.34, 94.74 respectively.

Keywords: Barnyard millet, kheer, sensory analysis, *Echinochloa esculenta*, overall acceptability

Introduction

Milk is almost an ideal food. It has a high nutritional value. It supplies body building proteins, bone forming minerals and health giving vitamins and furnishes energy-giving lactose and milk fat. Besides supplying certain essential fatty acids, it contains the above nutrients in an easily digestible and assailable form. All these properties make milk an important food (De, 2009) [1]. The total milk production in the country is estimated as 230.58 million tons during 2022-23 registered a growth of 22.81% over the past 5 years which was 187.75 million tons in 2018-19 (Milk production by state/ UT'S, Basic Animal Husbandry Statistics, MoFAHD, DAHD, GoI National dairy development board, <https://www.nddb.coop/information/stats/milkprodstate>). In different parts of the country the *kheer* is known by different names, such as ‘*Kheer*’ in North Western region, ‘*Paysam*’ in Southern region, ‘*Payas*’ in Eastern region, ‘*Phirni*’ in Northern region and ‘*Kheech*’ in Mewar region of Rajasthan (Thompson, 1995) [10]. *Kheer* is a very delicious cereal based indigenous milk product. It is popular throughout the country and enjoyed by all sections of the society, because of its good taste, high nutritional value and relatively low cost. It is prepared by partially dehydrating whole milk in a *karahi* over a direct fire together with sugar and rice or occasionally semolina, coconut, pistachio, cashew nut, almonds, saffron and cardamom (Patel and Singh 2002) [9]. Today's consumers were increasingly seeking functional foods, value addition, health and medicinal interventions in the milk product. Due to today's upward consumer awareness and interest to follow healthy nutrition and value addition in achieving their health benefits from food beyond their basic nutrition, the market for value added foods has expanded manifolds. International Year of Millets 2023 will be an opportunity to raise awareness of and direct policy attention to the nutritional and health benefits of millets and their suitability for cultivation under adverse and changing climatic conditions. The year was also promoted the sustainable production of millets, while highlighting their potential to provide new sustainable market opportunities for producers and consumers (International year of millet 2023, Nabard's Engagements with millets, <https://www.nabard.org/international-year-of-millets-2023>). The low glycemic index of barnyard millet and the polyphenols present in Barnyard millet inhibit the hydrolysis of complex sugar, resisting the glucose spike that results in diabetic conditions.

(Dayakar Rao *et al.* 2017) [2]. The high iron content in barnyard millet makes it an excellent source of food to cure anemia. Barnyard millet is full of phenols and flavonoids, which makes it a superior source of antioxidants that are good for maintaining skin health. Moreover, the presence of iron and zinc helps promote strong hair growth (Dayakar Rao *et al.* 2017) [2].

Materials and Methods

The present investigation on “Studies on preparation of barnyard millet (*Echinochloa esculenta*) *kheer*” was carried out at the Department of Animal Husbandry and Dairy Science College of Agriculture, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani. Milk was standardized to 6 per cent fat and 9 per cent SNF by Pearson's formula and Good quality rice and barnyard millet was procured from the local market of Parbhani.

Treatment Details

Following treatment combinations were considered for studies on preparation of barnyard millet *kheer*.

Treatment combinations

T₀= 97.5 part of buffalo milk by weight + 2.5 part of rice (control sample).

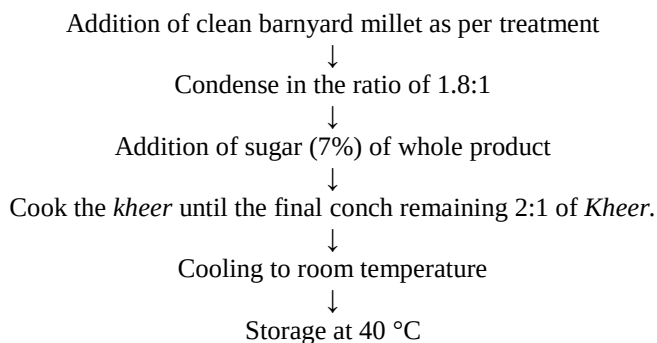
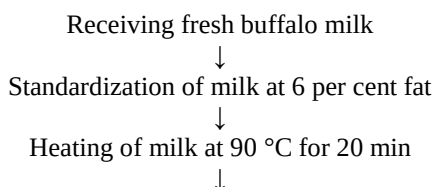
T₁= 98.5 part of buffalo milk by weight + 1.5 part of barnyard millet.

T₂=97.5 part of buffalo milk by weight + 2.5 part of barnyard millet.

T₃=96.5 part of buffalo milk by weight + 3.5 part of barnyard millet.

T₄=95.5 part of buffalo milk by weight + 4.5 part of barnyard millet.

Flow diagram for preparation of *kheer* blended with barnyard millet



Sensory evaluation of barnyard millet *kheer*

Sensory evaluation of barnyard millet *kheer* was carried out by a panel of judges so as to grade the product and to know the acceptability. It was judged for colour and appearance, flavour, body and texture and overall acceptability by using 9-point Hedonic scale.

Statistical Analysis

The results obtained during the course of the research trial were statistically analysed by using completely randomized design as described by Panse and Sukhatme (1967) [8].

Results and Discussion

Sensory Evaluation

The various treatment combinations of barnyard millet *kheer* were subjected to sensory evaluation for flavour, colour and appearance, body and texture and Overall acceptability attributes by a panel of judges using a 9-points hedonic scale. The score for flavour for treatments range between 7.80 to 9.00. (Table 1). The flavor acceptability of barnyard millet *Kheer*, with varying scores in different treatments. The judges preferred blending 1.5% barnyard millet in buffalo milk over the control sample, with overall scores of 8.75, 9.00, 8.40, 8.00, and 7.80, respectively. The study suggests that incorporating barnyard millet into buffalo milk can enhance flavour. Treatment T₁ obtained the highest score for flavour i.e. (9.00) while treatment T₄ obtained lowest score for flavour i.e. (7.80). (Table 1)

These results were in close agreement with the results obtained by Gautam *et al.* (2013) [3], Manojkumaret *al.* (2015) [6].

Table 1: Sensory evaluation of barnyard millet *kheer*.

Organoleptic parameters	Flavour	Colour & Appearance	Body and texture	Overall acceptability
T ₀	8.75	8.25	8.75	8.50
T ₁	9.00	8.75	9.00	8.75
T ₂	8.40	7.00	7.50	7.50
T ₃	8.00	6.50	7.00	6.50
T ₄	7.80	6.25	6.50	6.00

Sensory scores for colour and appearance score range between 6.25 to 8.75 (Table 1). The colour and appearance score for T₁ is highest (8.75) i.e. T₁ treatments are better than the rest of treatments. While treatment T₄ obtained the lowest score for colour and appearance i.e. (6.25 Table 1). The overall score for color and appearance in treatment T₀, T₁, T₂, T₃, and T₄ were 8.25, 8.75, 7.00, 6.5, and 6.25, respectively. All treatment combinations were statistically significant. Treatment T₁ was referred by the judges. These results were in close agreement with the results obtained by Narwade *et al.* (2003) [7]. Sensory score for body and texture score range between 6.50 to 9.00 (Table 1). The body and

texture for T₁ is higher 9.00. These results were in close agreement with the results obtained by Narwade *et al.* (2000) Gautam *et al.* (2013) [7, 3].

Overall acceptability ranges between 6.00 to 8.75 (table 1) all treatments. The maximum score (8.75) was obtained for the treatment T₁ and the minimum score (6.00) was obtained for the treatment T₄.

Conclusion

The sensory attributes evaluation revealed that barnyard millet *kheer* T₁ exhibits superior organoleptic properties in terms of flavor, color, appearance, body, texture, and overall

acceptability compared to other treatments. The study investigates the cost of preparing barnyard millet *kheer*, considering factors like buffalo milk, rice, sugar, labor, fuel, and miscellaneous charges. The cost ranges from Rs 93.44 to Rs 94.74 per kg, with the highest cost in treatment T₄ and lowest in treatment T₀, where 2.5 per cent rice was added. The *kheer* produced from barnyard millet has similar characteristics to whole buffalo milk and rice.

References

1. De S. Outlines of Dairy Technology. New Delhi, India: Oxford University Press, 2009.
2. Dayakar Rao B, Bhaskarachary K, Arlene Christina GD, Sudha Devi G, Vilas A, Tonapi. Nutritional and Health benefits of Millets. Hyderabad, India: ICAR-Indian Institute of Millets Research (IIMR), 2017, p. 112.
3. Gautam A, Jha AA, Singh R. Sensory and textural properties of channa kheer made with three artificial sweeteners. Int J Dairy Tech. 2013;66(1):109-118.
4. International year of millet 2023, Nabard's Engagements with millets. Available from: <https://www.nabard.org/international-year-of-millets-2023>
5. Milk production by state/UTs. Basic Animal Husbandry Statistics. New Delhi, India: MoFAHD, DAHD, GoI National Dairy Development Board. Available from: <https://www.nddb.coop/information/stats/milkprodstate>
6. Manojkumar R, Salunkhe P, Sawant DN, Raju DC. Physico-chemical analysis and sensory evaluation of kheer fortified with carrot shreds. J Anim Res. 2015;5(4):849-853.
7. Narwade SG, Patil GR, Sontakke AT, Patil RA. Preparation of kheer from safflower milk blended with buffalo milk. Indian J Dairy Sci. 2003;56(4):197-202.
8. Panse VG, Sukhatme PV. Statistical Methods for Agricultural Workers. New Delhi, India: ICAR Publication, 1967.
9. Patel AJ, Singh AA. Physico-chemical properties of instant kheer mix. Lait. 2002;82(4):501-513.
10. Thompson DK. Dairy Industry in India: A Scenario. Indian Food Industry. 1995;14(2):18-20.