Biological Forum – An International Journal **15(5a): 52-57(2023)**

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

Studies on Proximate Composition and Cost Structure of Dried *Kheer* mix using Pumpkin Powder

Shaikh Adil[1*], Gajanan Narnaware[2], Bhushan Meshram[2], Anant Dhotre[2], Hemant Gawande[2], Nitin Shinde[2], Vijay Kele[1] and Bhavesh Chavhan[1]

[1]Department of Dairy Technology, PIT, Parul University, Vadodara (Gujarat), India,
[2] College of Dairy Technology, Warud (Pusad),
Maharashtra Animal and Fishery Sciences, University, Nagpur (Maharashtra) India.

(Corresponding author: Shaikh Adil)*
(Received: 29 March 2023; Revised: 25 April 2023; Accepted: 02 May 2023; Published: 15 May 2023)
(Published by Research Trend)

ABSTRACT: Instant foods are a need of today's world because of the changing socio-economic pattern of life. Dried *kheer* mix is one of the convenience food for the preparation of instant *kheer*. For the preparation of such dried mix, various challenges are occurred such as maintaining the desired nutritional composition and ensuring cost-effectiveness in the production process. The purpose of this study was to investigate the effect of pumpkin powder on the compositional characteristics and cost structure of dried *kheer* mix. Pumpkin powder (PP) was added to the dry *kheer* mix varying levels of 1- 4 percent to replace skim milk powder (SMP) by an equal amount, resulting in a final mix that contained 44 percent PP and SMP. The other ingredients such as sugar powder (36 %), rice powder (10 %), hydrogenated fat (7 %), nutmeat powder (2.1 %), cardamom (0.7 %), and colour (0.2 %) by weight were used. Treatment combinations were used as T_1 (1 % PP & 43 % SMP), T_2 (2 % PP & 42 % SMP), T_3 (3 % PP & 41 % SMP), and T_4 (4 % PP & 40 % SMP). The product was analyzed for moisture, fat, protein, acidity, reducing sugar, total sugar, and ash content. Results revealed that an increased level of pumpkin powder leads to a significant ($P<0.05$) decrease in protein and ash contents while an increase in fat content. Other parameters such as moisture, reducing sugar, total sugar content, and lactic acidity were non-significant at a 5 % level of significance. The cost of production was estimated for all the treatments, varying in the range of Rs. 274.62 – Rs. 278.62 per kg of mix. As the level of pumpkin powder in dried *kheer* mix increases, the cost of production increases.

Keywords: Composition, Cost, Dried *kheer* mix, *Kheer*, Pumpkin powder.

INTRODUCTION

Over the past few decades, there has been a significant change in the cooking style and eating habits in India. This is primarily due to the excessively busy approach and stress in everyone's lifestyle. As a result, convenience foods have become an essential part of people's daily lives in today's world (Pendse and Patil 2016). Convenience foods require less preparation time, such as light heating/warming for ready-to-eat foods. Convenience foods, on the other hand, are affected by their composition, shape, size, and processing method (Saxsena 2017). Changes in people's eating habits and lifestyles have resulted in an increased desire for nutrient-dense foods that require less preparation time and are cost-effective. This can be demonstrated by providing 'Ready to Eat' or 'Ready to Serve' food sources and ready mixes for a variety of foods, which are becoming increasingly popular these days (Kadam *et al*., 2011).

Kheer, also known as *payasam*, is a famous cereal-based milk product that is also known in Indian mythology as "celestial nectar." It is a wholesome, palatable, and extremely nutritious weaning food, breakfast, side dish, or dessert because it is prepared from milk and cereals. Consumption of milk products in convenient forms is expanding worldwide, including in India due to increased urbanization. *Kheer* is an important traditional dairy product in Southeast Asian countries, including India (Adil *et al*., 2015). Jamun mix, Badam mix, *Kheer* mix, Basundi mix, and Dalia dessert mixes are some of the most popular dairy products available in this market (Kulkarni and Reddy 2007). *Kheer* prepared within less time utilizing the concept of convenience foods is relatively new to the Indian market; which gaining popularity too (Jha *et al*., 2002).

Nowadays, the concept of *kheer* has changed from rice-based *kheer* to a few different *kheer*-making varieties such as pulse-based (Bengal gram *kheer* & Green gram *kheer*), cereal-based (Rice *kheer*, Wheat *kheer*, Rice Suji *Kheer* and Avalakki *kheer*), Tuber crop-based (Sabakki *kheer*, Kaddu ki *kheer* & Movina *kheer*), Fruit based (Mango *kheer* & Jackfruit *kheer*), Seed based such as Poppy seed *kheer* (Unnikrishnan *et al*., 2000) with the concern of improving the nutritional quality of

the food. According to Chatterjee *et al*. (2010), adding vegetables to dairy products can increase diversity as well as dietary fiber too. A dried *kheer* mix utilizing pumpkin powder results in a higher nutritional profile of the product and an increase in the product's shelf life. Additionally, the development of innovative packaging techniques and long shelf life has further enhanced the appeal of dried *kheer* mix in the market (Deshmukh *et al.*, 2022).

Various authors prepared dried *kheer* mix with the addition of fruits and vegetables as a source of value addition. Sarma *et al*. (2016) studied the development of ready-to-cook instant *kheer* mix using maida (1400 g), refined oil (90 mL), and water (350 mL). Kokani (2019) prepared a dried *kheer* mix using earthy-colored rice as a source of dietary fiber content. Panda *et al.* (2019) studied the compositional and processing effects in promoting the bioaccessibility of iron and zinc in ready-to-cook high-protein *kheer* mix using legumes. Jose *et al*. (2022) made a dried *kheer* mix to evaluate the engineering properties of an experimental sample of dry crystallized rice flake-milk pudding convenience mix (prepared using an in-house developed mechanical unit) against a control (prepared using manual stirring).

Pumpkin belongs to the plant kingdom and family *Cucurbitaceae*, which also contains squash (*Cucurbita maxima*) and cucumbers widely produced in tropical and subtropical regions. Worldwide there are three types of pumpkins, namely *Cucurbita pepo, Cucurbita maxima, and Cucurbita moschata* (Lee *et al*., 2003). *Cucurbita moschata* is the most popular edible pumpkin in Asia and the United States. Pumpkin is a rich source of carotene, vitamins, minerals, pectin and dietary fiber. The fiber content of pumpkin is 2.9 g/100 gm total dietary fiber including 2.4 g/100 insoluble and 0.5 g/100 soluble dietary fiber (Panda 2003) pertaining wide range of biomedical effects and are also linked to a lower incidence of chronic bowel disease, diabetes, colon cancer, and other diseases (Cho and Dreher 2001).

The suitability of pumpkins for utilization in product development has also been reported by Dhiman *et al*. (2007). Pumpkin fruit can be converted into flour which has a longer shelf-life, highly desirable sweet flavor, and deep yellow-orange color (Dhiman *et al*., 2009). Pumpkin flour or pumpkin flour based-products are an excellent source of vitamin A, β-carotene, and protein content (Kiharson *et al*., 2017) and dietary fiber (Cerniauskiene *et al*., 2014). Various pumpkin products have been documented in the literature, including dehydrated pumpkin mix (Kane 1971), soup and curry (Kandlakunta *et al*., 2008), pasta and flour mix (El Demary *et al*., 2011), bread (See *et al*., 2007), crackers (Noor Aziah and Komathi 2009), and *kheer* using pumpkin cubes and shreds (Changade *et al*., 2012).

Kheer appears to have a lot of potential to become a commercial product if it is manufactured with a long shelf life and sufficient fibers. So considering the scope and potential of convenience foods and various forms of *kheer* that are already prepared, the present study was undertaken to develop a pumpkin-based dried *kheer* mix due to the various health properties of pumpkin. The objective of the present study was to investigate the effect of pumpkin powder on the physico-chemical properties of dried *kheer* mix supplemented with pumpkin powder and the estimation of the cost of production for dried *kheer* mixes using pumpkin powder at various levels.

MATERIAL AND METHODS

Procurement of ingredients. Skim milk powder, sugar, rice, hydrogenated fat, nuts, pumpkin, cardamom capsules, and colour were all purchased from the local market i.e. Pusad, Maharashtra, in order to make the dry *kheer* mix.

Preparation of ingredients. The pumpkin powder was prepared as suggested by See *et al.* (2007) with slight modifications. Rice powder was prepared using the method given by Ghosh and Mukherjee (1998). The dried rice was ground and sieved through 300 µm mesh to obtain a fine powder.

Formulation of dried *kheer* mix. The measured quantities of various ingredients were mixed and the pumpkin powder was incorporated at the rate of 1 - 4 % to replace skim milk powder (SMP) by an equal amount, resulting in a final mix that contained 44 percent pumpkin powder. The notations used for various treatment is as follows:

T_1 = 1 per cent pumpkin powder + 43 per cent skim milk powder

T_2 = 2 per cent pumpkin powder + 42 per cent skim milk powder

T_3 = 3 per cent pumpkin powder + 41 per cent skim milk powder

T_4 = 4 per cent pumpkin powder + 40 per cent skim milk powder

Other ingredients were taken such as sugar powder (36 %), rice powder (10 %), hydrogenated fat (7 %), nutmeat powder (2.1 percent), cardamom (0.7 percent), and colour (0.2 %) weight by weight.

After taking a precisely measured quantity of ingredients as per the treatment, the dried *kheer* mix was prepared as shown by the flow diagram in Fig. 1.

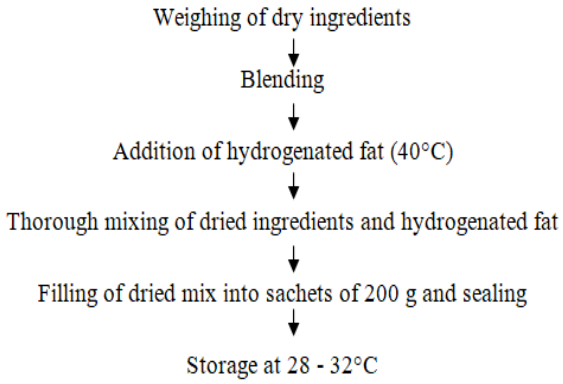

Fig. 1. Protocol for preparation of vegetable-based dried *kheer* mix.

Analysis of dried *kheer* mix. Dried *kheer* mix samples were analyzed for moisture, fat, protein, and ash as per, BIS SP: 18, Part XI (1981) while reducing and total sugar were estimated as suggested by Ranganna (2004).

Cost of production. The cost of production of vegetable-based dried *kheer* mix for 1 kg was worked out as per the guidelines of Narnaware (2002) considering the prevailing rates of raw material, labor charges, gas, electricity and other miscellaneous charges, etc.

Statistical analysis. Each treatment had been repeated five times, and the data collected were statistically analyzed using Completely Randomized Design (Snedecor and Cochran 1994). Statistical significance was tested at a 5 % level.

RESULTS AND DISCUSSION

Physico-chemical properties of dried *Kheer* mix. The average value for moisture, fat, protein, sugar, and ash contents of dried *kheer* mix observed in the study are shown in Table 1. Most of these values are in close agreement with that reported by Singh and Shurpalekar (1989) for semolina-based dry *kheer* mix. The results for reducing sugar and total sugar content are in agreement with Manjunatha *et al*. (2003) for carrot-based *kheer* mix. In another study, a similar composition of instant dried *kheer* mix was observed apart from the fat content (Jha, 2000).

The average values of five replications recorded for the moisture content of four treatments are given in Table 1. The statistical analysis shows that differences in all treatments are non-significant. The highest moisture content (3.90 %) was recorded for treatment T_4 and the lowest fat content (3.57 %) was noted for treatment T_1. Similar results were observed by Singh and Shurpalekar (1989) for *kheer* mix using bansi *soji* and wheat *soji* while Jha (2000) assessed the quality of instant dried *kheer* mix and reported the moisture content in the range of 1.86 - 1.98 percent.

Table 1: Composition of pumpkin *kheer* and dried *kheer* mix.

Parameters (%)	T_1	T_2	T_3	T_4	SEm	CD at 5 %
Moisture	3.57 ± 1.19 [a]	3.82 ± 0.48 [a]	3.84 ± 0.66 [a]	3.90 ± 0.50 [a]	0.344	1.030
Fat	6.83 ± 0.44 [a]	6.92 ± 0.39 [a]	7.05 ± 0.26 [a]	7.47 ± 0.55 [b]	0.216	0.646
Total protein	16.11 ± 0.87 [a]	15.56 ± 1.21 [ab]	15.23±1.60 [bc]	14.98±0.47 [c]	0.503	1.505
Acidity (% LA)	0.54 ± 0.06 [a]	0.59 ± 0.04 [a]	0.61 ± 0.09 [a]	0.63 ± 0.06 [a]	0.032	0.095
Reducing sugar	10.86 ± 0.45 [a]	11.05 ± 0.89 [a]	11.12 ± 0.46 [a]	11.33 ± 0.48 [a]	0.263	0.786
Total sugar	59 .29 ± 5.38 [a]	59.51 ± 6.08 [a]	60.23±2.96 [a]	60.55 ± 2.71 [a]	2.026	6.065
Ash	1.64 ± 0.06 [a]	1.47 ± 0.22 [a]	1.49 ± 0.16 [a]	1.17 ± 0.11 [b]	0.068	0.204

Data represented as mean ± standard deviation means with different superscripts in a column differ significantly at a 5 % level of significance (n=5).

The statistical analysis revealed that fat content of dried *kheer* mix obtained from different treatments viz., T_1, T2, T_3, and T_4 was significantly affected by the increasing levels of pumpkin powder. Treatment T_4 recorded the highest fat content (7.47 %) while the lowest fat content (6.83 %) was recorded for T_1, dried *kheer* mix containing 1 percent pumpkin powder. There was a gradual increase in the fat content of the *kheer* mix with an increase in the level of pumpkin powder. This increase in the fat content from treatment T_1 to T_4 is due to the higher fat content of pumpkin powder (1.12 %) as compared to SMP (0.85 %). The values for the fat content of *kheer* mix are lower as compared to values recorded by Kadam (1998); 9.83-11.00 percent using whole milk powder, while Jha *et al.* (2002) reported 17.58-18.61 percent using whole milk.

From the results, it is revealed that all the treatments recorded statistically significant differences and the highest value for total protein content was found with T_1 (16.11 %) and the lowest total protein content was observed for T_4 (14.98 %). It can be observed from Table 1 that the values for total protein content decreased slightly with the increase in proportions of pumpkin powder in different treatments. In the present study, pumpkin powder used was testing 9.23 percent protein, and skim milk powder was testing 34.21 percent protein, thus the decrease in total protein content could be attributed to the protein content of pumpkin powder. The decrease in total protein content due to the addition of pumpkin powder was supported by Ravi *et al*. (2010).

The mean values for titratable acidity of different treatments as depicted in Table 1. The values recorded were statistically analyzed and the differences among the values of treatments were non-significant. The highest acidity 0.63 % LA was recorded for T_4 (containing 4 percent PP) and the lowest acidity of 0.59 % LA was recorded for treatment T_1. The results recorded indicate that there was an increase in acidity with an increase in the proportion of pumpkin powder.

A non-significant difference in reducing and total sugar was recorded among all the treatments. However, the treatments T_1 and T_2 were statistically at par and showed equal effects. The highest reducing sugar (11.33 %) and total sugar (60.55 %) content was observed for treatment T_4 and the lowest reducing sugar (10.86 %) and total sugar (59.29 %) content was noted for T_1. The reducing and total sugar was increased from T_1 to T_4 as the level of pumpkin powder increased. The values of reducing and total sugar for dried mixes using various proportions of pumpkin powder are similar to values observed by Manjunatha *et al*. (2003) who observed the values for carrot *kheer* mix using shredded carrot and skim milk powder.

As per Table 1, it is revealed that the amount of pumpkin powder in the *kheer* mix increases, there is a decrease in ash content. All the treatments showed statistically significant differences. The ash content of the different treatments was 1.64 percent (T_1), 1.47

percent (T_2), 1.49 percent (T_3), and 1.17 percent (T_4). The results obtained are consistent with Ravi *et al*. (2010). Pumpkin and skim milk powder were employed in this investigation, with ash content of 5.31 percent and 7.27 percent, respectively. Similar results were observed by See *et al*. (2007) and Ravi *et al*. (2010). The results are in close agreement with Kadam (1998) for dried *kheer* mix using whole milk powder.

Cost of production. Data about the cost of production of dried *kheer* mixes supplemented with pumpkin powder is shown in Table 2. The cost of production for vegetable-based dried *kheer* mix was calculated by the method used by Narnaware (2002) considering the actual retail cost of ingredients/material at local cost. The cost of production of 1 kg dried *kheer* mix was worked out considering the prevailing cost of raw materials, gas, electricity, labor, packaging materials, equipment, etc. The cost for nuts is taken as an average for all three nuts viz. almonds (560 per kg), cashew (480 per kg) and pista (1200 per kg). The miscellaneous cost includes labor cost, depreciation of building and equipment maintenance, quality control, etc.

Kadam (1998) reported the cost of production for ready *kheer* mix was Rs. 21.00 per kg; while Jha (2000) worked on the cost of production for 500 g *kheer* mix was Rs. 47.30. Dixit *et al.* (2004) analyzed the cost of production for *palada* payasam mix and the cost worked out to be Rs. 93.25 per kg. Table 2 revealed that dried *kheer* mix with pumpkin powder was slightly costlier than other dried *kheer* mixes. The cost of production of 1 kg vegetable-based dried *kheer* mix was Rs. 274.62, Rs. 276.62, Rs. 278.62, and Rs. 280.62 for T_1, T_2, T_3, and T_4 respectively.

Table 2: Cost of production for vegetable-based dried *kheer* mix.

Ingredients (Rs. /kg)	Rate (Rs.)	Treatment cost (Rs.)			
		T_1	T_2	T_3	T_4
Skim milk powder	260.0 / kg	111.80	109.20	106.60	104.00
Sugar	35.00 / kg	12.60	12.60	12.60	12.60
Pumpkin flesh	40.00	4.60	9.20	13.8	18.40
Hydrogenated fat	76.00	5.32	5.32	5.32	5.32
Rice	60.00	6.6	6.6	6.6	6.6
Nuts (2.1%)	746.66	15.68	15.68	15.68	15.68
Cardamom	1500.00	10.5	10.5	10.5	10.5
Color	400.00	0.8	0.8	0.8	0.8
Total cost of ingredients	-	**167.90**	**169.90**	**171.90**	**173.90**
Electricity	-	30.10	30.10	30.10	30.10
Steam		4.66	4.66	4.66	4.66
Packaging	-	1.75	1.75	1.75	1.75
Miscellaneous cost	-	70.21	70.21	70.21	70.21
The total cost of *kheer* mix/kg	-	**274.62**	**276.62**	**278.62**	**280.62**

The cost of production for 1 kg dried *kheer* mix was low for T_1 amongst other *kheer* mixes and shows the highest score for sensory attributes as compared to T_2, T_3, and T_4 (Adil *et al*., 2015). The increase in the cost of production may be due to inflations in market prices of various ingredients. Also, the higher cost of dried *kheer* mix is due to the addition of nutmeat powder and miscellaneous costs including labor costs. The present findings are in agreement with Solanki *et al*. (2018); who reported that cost of production increases with an increase in the level of incorporation of finger millet powder in a *kheer*. Similarly, Barela and Shelke (2017) prepared kheer from cow milk blended with coconut milk and reported that the cost of *kheer* increased with an increase in the levels of blending of coconut milk in cow milk

CONCLUSIONS

With increases in the rate of addition of pumpkin powder, physico-chemical quality such as fat and acidity of the product increased significantly, while protein and ash content declined. Moisture, total sugar and reducing sugar shows non-significant effect. It was also observed that increasing the amount of pumpkin powder in the *kheer* mix increased the cost of production. As a result of the current experiment, it can be concluded that reconstituted *kheer* can be made from a dried *kheer* mix containing 1% pumpkin powder and 43% skim milk powder at a lower cost than other *kheer* mixes. Developing such value-added pumpkin products could provide consumers with more variety while also providing nutritional and therapeutic benefits. This food product is easy to use, saves time, and promotes good health, so it can be used in a variety of food-based intervention functions.

FUTURE SCOPE

The development of vegetable-based dried *kheer* holds promising opportunities for innovation and expansion in the food industry. With increasing interest in plant-based diets and the demand for healthier dessert options, incorporating vegetables into dried *kheer* mix presents numerous possibilities. Furthermore, there is an opportunity to develop vegetable-based dried *kheer* mixes that cater to specific dietary requirements, such as gluten-free or vegan options. By using alternative ingredients like coconut milk powder or gluten-free grains, the dried *kheer* mix can accommodate a wider range of dietary preferences and restrictions. As consumer preferences continue to evolve towards healthier and sustainable food choices, the development of vegetable-based dried *kheer* holds great potential for

market growth, catering to a diverse range of dietary needs and preferences.

Acknowledgment. The authors express their sincere gratitude to the Associate Dean and Head of Department, College of Dairy Technology, Warud (Pusad), MAFSU-Nagpur for their gracious permission to conduct this study and for their invaluable support throughout the investigation.
Conflicts of Interest. None.

REFERENCES

Adil, S., Changade, S., Dhotre, A. & Chopde, S. (2015). Studies on sensory and keeping qualities of pumpkin based Kheer. *Asian Journal of Dairy and Food Research*, *34*(4), 270-274.

BIS (1981). Handbook of Food Analysis, XI; Dairy products, SP: 18. Bureau of Indian Standards, New Delhi.

Cerniauskiene, J., Kulaitiene, J., Danilcenko, H., Jariene, E. & Jukneviciene, E. (2014). Pumpkin fruit flour is a source of food enrichment in dietary fiber. *Notulae Botanicae Horti Agrobotanici Cluj-Napoca*, *42*(1), 19-23.

Changade, S. P., Wasnik, P. G., Waseem, M., Kadu, A. B. & Chapke, J. S. (2012). Process upgradation of bottle gourd and pumpkin kheer. *Journal of Dairying Foods & Home Sciences*, *31*(1), 28-33.

Chatterjee, A., C., Kanawjia, S. K., & Yogesh, K. (2010). Combination of milk with other foods. *Indian Dairyman*, 62(10), 58-66.

Cho S. S., Dreher M. L. 2001. *Handbook of Dietary Fiber*. Marcel Dekker, Inc. New York. pp 1-2.

Deshmukh, A., Inamdar, A. A., & Desai, D. S. (2022). Development of low-cost ready-to-mix kheer mix. *Journal of Food Science and Technology*, *59*(1), 316-324.

Dhiman, A.K., Muzaffar, S. & Attri, S. (2007). Evaluation of pumpkin (*Cucurbita moschata*) for product development. *Himachal Journal of Agricultural Research*, 33, 223-227.

Dhiman, A. K., Sharma, K. D. & Attri, S. (2009). Functional constituents and processing of pumpkin: A review. *Journal of Food Science and Technology*, *46*(5), 411.

Dixit, P. K., Kesavan, V. K., Shrivasa Murthy, B. R., Janakshi & Geetha Kumari, K. (2004). Techno-economic evaluation of technology transfer – A case study of Gulab Jamun and palada payasam mix. *Indian Journal of Dairy & Bioscience*, *15*, 104-106.

El-Demery, M. E. (2011). Evaluation of physico-chemical properties of toast breads fortified with pumpkin (*Cucurbita moschata*) flour. In: 6th Arab and 3rd International Annual Scientific Conference on Development of Higher Specific Education Programs in Egypt and the Arab World in the Light of Knowledge Era Requirements, Faculty of Specific Education, Mansoura University, Mansoura, Egypt (Vol. 1, pp. 13-14).

Ghosh, A. K. & Mukherjee, S. (1998). Studies on developments of methods for the production of quick-cooking rice. *Journal of Food Science and Technology*, *25*, 182-185.

Jha, A. (2000). Development of process for long-life *kheer* and instant *kheer* mix. Ph. D. thesis submitted to NDRI Deemed University, Karnal.

Jha, A., Patel, A. & Singh R. R. B. (2002). Physico-Chemical properties of instant *Kheer* mix. *Lait: Food Science and Technology*, *82*, 501-513.

Jose, N., Ravindra, M. R. & Deshmukh, G. P. (2022). Effect of dry-crystallization method on the engineering properties of an instant mix for rice flake-milk pudding. *Measurement: Food*, 7, 100044.

Kadam, B. R. (1998). Studies on formulation of *kheer* ready mix. M.Sc. thesis submitted to Marathwada Agri. University, Parbhani.

Kadam, B. R., Lembhe, A. F. & Zanjad, P. N. (2011). Formulation of kheer ready-mix based on sensory attributes. *Tamil Nadu Journal of Veterinary and Animal Sciences*, *7*(2), 88-93.

Kandlakunta, B., Rajendran, A. & Thingnganing, L. (2008). Carotene content of some common (cereals, pulses, vegetables, spices, and condiments) and unconventional sources of plant origin. *Food Chemistry*, *106*(1), 85-89.

Kane F. J. (1971). Dehydrated pumpkin mix. US patent. US 3 597 231.

Kiharason, J. W., Isutsa, D. K. & Ngoda, P. N. (2017). Effect of drying method on nutrient integrity of selected components of pumpkin (*Cucurbita moschata* Duch.) fruit flour. *ARPN Journal of Agricultural and Biological Science*, *12*(3), 110-116.

Kokani, R. C., Gade, S. Y., & Balsaraf, S. S. (2019). Studies on Formulation and Quality Evaluation of Instant Brown Rice Kheer Mix. *International Journal for Innovative Research in Science and Technology*, *6*(5), 1-4.

Kulkarni, S. & Reddy, K. V. (2007). Ready mixes of traditional Indian dairy foods. Souvenir, *International Conference on Traditional Dairy Foods*, November, 14-17, 2007; OP–14:8.

Lee, Y. K., Chung, W. I., & Ezura, H. (2003). Efficient plant regeneration via organogenesis in winter squash (*Cucurbita maxima* Duch.). *Plant Science*, 164(3), 413-418.

Manjunatha, S. S., Mohan Kumar, B. L. & Das Gupta D. K. (2003). Development and evaluation of carrot *kheer* mix. *Journal of Food Science and Technology*, 40, 310-313.

Narnaware, G. N. (2002). Economics of manufacturing dairy products in a Dairy plant. M.Sc. thesis submitted to NDRI Deemed University, Karnal.

Noor Aziah, A. A. & Komathi, C. A. (2009). Acceptability attributes of crackers made from different types of composite flour. *International Food Research Journal*, *16*(4).

Panda, H. (2003). *Herbal Foods and its Medicinal Values*. NIIR Publications, New Delhi. p 483.

Panda, S. L., & Jaiswal, A. (2019). Compositional and processing effects in promoting the bioaccessibility of iron and zinc of ready to cook high protein *kheer* mix. *LWT: Food Science and Technology*, *109*, 186-193.

Pendse, M. & Patil, G. (2016). A Study on Emerging Opportunities in Indian Convenience Food Markets. *Khoj Journal of Indian Management Research & Practices.*

Ranganna S. 2004. *Handbook of analysis and quality control for fruit and vegetable products*. Tata McGraw- Hill Co. Limited, New Delhi, pp: 14-18.

Sarma, K. C., Sarma, S. & Rahman, S. M. A. (2016). Development of Ready-to-Cook Instant Kheer Mix. *Journal of Krishi Vigyan*, *5*(1), 23-25.

Saxsena, A. J. (2017). Convenience foods: Foods of the future. *Agriculture Extension Journal*, *1*, 05-10.

See, E. F., Wan Nadiah, W. A. & Noor Aziah, A. A. (2007). Physico-chemical and sensory evaluation of bread supplemented with pumpkin flour. *International Food Research Journal*, *14*(2).

Sing, B., & Shurpalekar, S. R. (1989). Studies on ready-mix for kheer. *Journal of Food Science and Technology* (Mysore), *26*(1), 12-15.

Snedecor G. W., Cochran W. G. (1994). *Statistical Methods*. 8th Ed. The Lowa State University Press, Ames, Lowa.

Solanki, K. G., Narwade, S. G., & Kamble, N. S. (2018). Preparation of finger millet kheer. *International Journal of Current Microbiology and Applied Science, 6*, 2326-2331.

Unnikrishnan, V., Bhavadasan, M. K., Nath B. S., Vedavathi M. K. & Balasubramanya N. N. (2000). Payasam and sweet delicacy. *Indian Dairyman, 52*, 37-42.

Ravi, U., Menon, L. & Anupama, M. (2010). Formulation and quality assessment of instant dhokla mix with incorporation of pumpkin flour. *Journal of Scientific and Industrial Research, 69*, 956-960.

How to cite this article: Shaikh Adil, Gajanan Narnaware, Bhushan Meshram, Anant Dhotre, Hemant Gawande, Nitin Shinde, Vijay Kele and Bhavesh Chavhan (2023). Studies on Proximate Composition and Cost Structure of Dried *Kheer* mix using Pumpkin Powder. *Biological Forum – An International Journal*, *15*(5a): 52-57.