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Studies on organoleptic quality of kharudi prepared from germinated bajra using chakka whey as soaking agent

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Abstract

The present study was carried out on “Studies on preparation of germinated bajra kharudi by using chakka whey as soaking agent”. The research was conducted in the laboratory Experiential Learning of Department of Animal Husbandry and Dairy Science, College of Agriculture, VNMKV, Parbhani during the year 2016-17. In this study bajra groat were soaked in chakka whey for different durations 8, 12 and 16 hr. for preparation of kharudi. Organoleptic parameters of fried kharudi of fried kharudi was evaluated, Organoleptic evaluation of raw kharudi and fried kharudi in respects of overall acceptability scored highest for fried kharudi samples prepared from bajra groat using chakka whey as soaking agent for 12 hr.

Keywords: Bajra groat, chakka, Kharudi

Introduction

Millets offer unique advantage for health being rich in micronutrients, particularly minerals and B vitamins as well as nutraceuticals. Millets are also importance as ingredient in multigrain and gluten-free cereal products. (Chandrasekara and Shahidi, 2011). Pearl millet contains high nutritive value like protein 11.6 g, fat 5.0 g, crude fiber 1.2 g, carbohydrate 67.5 g/100 g, iron 8 mg/100 g, zinc 3.1mg/100 g, magnesium 137 mg/100 g, calcium 42 mg/100 g and rich source of energy 361 Kcal/100g (Vanisha *et al.*, 2011) [6]. In India millet are used to prepare various traditional foods and beverages like idli, dosa, papad, *chakli*, porridges, breads, infant and snack foods (Chandrasekara and Shahidi, 2011).

Consumption of the whey can supplement much of the lost organic and inorganic nutrients to the extra cellular fluid and utilization of these fluids can be targeted to the people. Many researchers have been studying alternative possibilities to utilize whey more economically, especially in the production of valuable raw mater materials rather than the manufacture of whey powder (Rajka *et al.*, 2014) [5]. It is now accepted that its main content, whey proteins, have antimicrobial, antiviral and antioxidant properties, can offer a kind of protection against cancer and heart diseases and assist at the enhancement of immune defense. *Chakka* whey from cow milk contained minerals like Ca, Mg, P, Na, K, Cl, Cu, Fe and Zn at 113.50, 10.76, 73.62, 38.36, 130.20, 115.27, 0.0119, 0.057 and 0.370 mg/100 g, respectively. Buffalo milk *chakka* whey has higher concentration of Na, P and Cu and lower concentration of K and Cl than cow milk *chakka* whey. Total mineral contents of products ranged from 0.32 per cent for cow milk *chakka* whey to 0.65 per cent for buffalo milk *chakka* whey (Babar *et al.*, 2008) [1].

Kharudi is the product prepared in the Maharashtrian recipe. It is popular mostly in the Hindu community. Generally *Kharudi* is prepared from the pearl millet in addition with spices which is used as or consumed as ready to eat product (Dudhate, 2017) [3]. Considering the importance of pearl millet in production of traditional food and to explore the possibility of utilization of *chakka* whey as a soaking agent during production and bajra groat and its utilization in preparation of *Kharudi*.

Materials and Methods

The present study entitled “Studies on Effect of Soaking Period on Organoleptic Quality of *Kharudi* Prepared from Germinated Bajra Using *Chakka* Whey as Soaking Agent” was carried out in the Department of Animal Husbandry and Dairy Science, College of Agriculture,

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Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani. The materials used and methods employed for conducting the experiments were as under:

Pearl Millets (Bajra)

Pearl Millet (*Pennisetum typhoideum*) cultivar variety PPC-6 (Parbhani Sampadha) was procured from Jowar Research Station, VNMKV, Parbhani.

Chakka whey

Chakka whey was prepared using buffalo milk from Department of AHDS, VNMKV, Parbhani.

Frying medium

Prepared *Kharudi* was fried in soybean refined oil.

Preparation of germinated bajra grain

The bajra grains are soaked in clean water for 10 hr. give the treatment to bajra grains with 0.2 per cent formaldehyde for 10 min to control mould growth and collect in moist muslin cloth. Tie the muslin cloth and put in clean and dry place for 48 hours by sprinkling water on its surface after every 12 hours. After germination dry the germinated bajra in sunlight for 2 hours and remove the plumule and radical emerged from the grains.

Preparation of Bajra groats

Accurately weighed (1 kg) germinated bajra grains was washed and dried in shade followed by coarse grinding to obtain medium size bajra groats. This was soaked in the water (1:3) for control sample and in *chakka* whey for experimental samples. The soaking periods was different as per the treatments viz. 12 hr., 8 hr., 12 hr. and 16 hr. at room temperature for fermentation to take place.

Preparation of Kharudi

25 ml refined soybean oil was taken in stainless steel vessel in which 5 g. of garlic paste, 5 g. cumin, 10 g. common salt and 5 g. chili powder was added with container heating after light browning of garlic paste add 1 lit. water in it. When the water came to boiling, 1 Kg. soaked bajra groats was poured with continuous stirring followed by addition of 25 g. Sesamum and mix well. Cooked it till the bajra groats becomes smooth. Cover it and cook for a few minutes more with stirring in between. After cooling at room temperature sufficient quantity of this cooked mixture was taken in *Kharudi* moulder having reasonably large sized holes in its plate. Made the spirals (*Kharudi*) on thick food grade plastic sheet followed by sun drying completely for two days, turning upside down once a day for effective drying on both sides.

Treatment details

For preparation of *Kharudi* using *chakka* whey as soaking agent was carried out using following treatments

- T₁: Bajra groats using water as soaking agent for 12 hr.
- T₂: Bajra groats using *chakka* whey as soaking agent for 8 hr.
- T₃: Bajra groats using *chakka* whey as soaking agent for 12 hr.
- T₄: Bajra groats using *chakka* whey as soaking agent for 16 hr

Result and Discussion

The fried *Kharudi* was subjected to organoleptic evaluation like Colour and appearance, texture (mouth feel), flavour and overall acceptability by scoring method using 9-point

Hedonic scale and score obtained is mentioned in table given below.

Table 1: Organoleptic quality of fried *Kharudi*

Treatment	Flavour	Colour and Appearance	Body and Texture	Overall acceptability
T ₁	6.50	6.86	7.20	6.50
T ₂	7.30	6.90	7.36	6.76
T ₃	8.20	8.20	8.90	8.36
T ₄	7.80	7.60	7.83	7.00
SE	0.36	0.26	0.19	0.53
CD	1.19	0.86	0.63	NS

Flavour

For fried *Kharudi* samples prepared from bajra groats of the treatments T₁, T₂, T₃ and T₄ flavour score was 7.2, 7.36, 8.93 and 7.83 respectively.

The maximum score was given to raw and fried *Kharudi* samples prepared from bajra groats of the treatment T₃ 8.13 and 8.2 respectively using *chakka* whey as soaking agent soaked for 12 hr. and minimum for both T₁ (6.7 and 7.2) using water as soaking agent soaked for 12 hr. Variation in flavour score of raw and fried *Kharudi* might be due to varied soaking period (fermentation). The flavour score of raw *Kharudi* is higher than the fried *Kharudi*. Present results are in agreement with Kamat and Yenagi *et al.* (2012)^[4] in the preparation of *NereHappala* of cereals and millets. They reported that flavour score of fried kurdi prepared from wheat batter of different treatment decreases as soaking period increases from 3 to 6 days which is due to the development of flavor.

Colour and appearance

For the treatments raw *Kharudi* T₁, T₂, T₃ and T₄ colour and appearance score was 5.93, 7.7, 8.53 and 7.86 respectively and for fried *Kharudi* samples prepared from bajra groats of the treatments T₁, T₂, T₃ and T₄ colour and appearance score was 6.86, 6.9, 8.2 and 7.66 respectively.

The maximum score was given to raw and fried *Kharudi* samples prepared from bajra groats of the treatment T₃ 5.93 and 7.86 respectively using *chakka* whey as soaking agent soaked for 12 hr. and minimum for raw *Kharudi* T₁ (5.93), for fried *Kharudi* T₂ (6.9) using water and *chakka* whey as soaking agent soaked for 12 hr. and 8 hr. respectively. In case of fried *Kharudi* variations in score might be due to physical quality attributes like frying parameters, cooking behavior, starch degradation due to fermentation effect. The present results are in good accordance with the results reported by Kamat and Yenagi *et al.* (2012)^[4] in preparation of *NereHappala* of cereals and millets.

Body and Texture

For raw *Kharudi* samples prepared from bajra groats of the treatments T₁, T₂, T₃ and T₄ body and texture score was 7.2, 7.36, 8.93 and 7.83 respectively. For fried *Kharudi* samples prepared from bajra groats of the treatments T₁, T₂, T₃ and T₄ body and texture score was 6.83, 7.73, 8.3 and 7.66 respectively. The maximum score was given to raw and fried *Kharudi* samples prepared from bajra groats of the treatment T₃ (8.93 and 8.3) respectively using *chakka* whey as soaking agent soaked for 12 hr. and minimum for raw *Kharudi* T₂ (7.36), for fried *Kharudi* T₄ (7.66) using *chakka* whey as soaking agent soaked for 8 hr. and 16 hr. respectively. The present findings were in accordance with results reported by Kamat and Yenagi *et al.* (2012)^[4] in the preparation of *Nere*

Happala They utilized papadkhara for improvement of texture of NereHappala which imparted crisp and brittle texture for to the fried papads.

Overall acceptability

For raw *Kharudi* samples prepared from bajra groats of the treatments T₁, T₂, T₃ and T₄ over all acceptability score was 6.33, 6.63, 8.5 and 8.03 respectively and for fried *Kharudi* samples prepared from *bajra* groats of the treatments T₁, T₂, T₃ and T₄ over all acceptability score was 6.5, 6.76, 8.36, and 7.0 respectively. The highest score given for fried *Kharudi* samples of the treatment T₃ (8.36) in which samples were prepared using *chakka* whey for 12 hr., while minimum obtained for T₁ (6.33) in which water used as soaking medium for 12 hr. at room temperature. The present results is in agreement with results reported by Kamat and Yenagi (2012)^[4] in preparation of *Nere Happala* from cereals & millets. They reported that significant variation in sensory score may be due to the nature of starch granules, structural and chemical composition of individual cereals and millets.

Conclusion

Soaking period affects organoleptic quality fried *Kharudi* prepared from bajra groat. *Kharudi* samples prepared from 12 hr. soaked in *chakka* whey scored high for overall acceptability. Soaking period of bajra groat for different durations affect colour characteristic of bajra groat, yellowness increased as the soaking period increased from 8 to 12 hr. and highest redness observed for 12 hr. soaked bajra groat in *chakka* whey.

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