The Pharma Innovation Journal 2019; 8(6): 52-54

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2019; 8(6): 52-54

www.thepharmajournal.com
Received: 08-04-2019
Accepted: 10-05-2019

Renuka Jandu
Ph.D. Scholar, Department of Foods and Nutrition, I.C. College of Home Science, CCS Haryana Agricultural University, Hisar, Haryana, India

Asha Kawatra
Professor, Department of Foods and Nutrition, I.C. College of Home Science, CCS Haryana Agricultural University, Hisar, Haryana, India

Correspondence
Renuka Jandu
Ph.D. Scholar, Department of Foods and Nutrition, I.C. College of Home Science, CCS Haryana Agricultural University, Hisar, Haryana, India

Nutritional composition of *kulcha* prepared from three varieties of pearl millet by incorporating soyabean flour

Renuka Jandu and Asha Kawatra

Abstract
The present investigation was conducted to evaluate the nutrient composition of *kulcha* prepared from three varieties of pearl millet with incorporating soyabean flour. The protein and fat content of *kulcha* developed from HC-20, HHB-67 improved and WHC-901 were observed as 14.26, 13.53 and 13.79 g/100g and 9.23, 8.71 and 9.88 g/100g, respectively. The concentration of calcium and iron in *kulcha* developed from HC-20, HHB-67 improved and WHC-901 were 39.51, 40.35 and 39.57 mg/100g and 4.47,3 3.57 and 3.16 mg/100g, respectively. It was found that development of pearl millet based bakery products is not only nutritionally superior but also provides an alternative to wheat based bakery products.

Keywords: Pearl millet, *kulcha*, soyabean, proximate composition, mineral

Introduction
Pearl Millet *(Pennisetum glaucum*), is a cereal crop grown in tropical semi-arid regions of the world primarily in Asia and Africa. Pearl millet is one of the four most important cereals (rice, maize, sorghum and millets) grown in the tropics and is rich in iron and zinc, contains high amount of antioxidants and these nutrients along with the antioxidants may be beneficial for the overall health and wellbeing. It is nutritionally better than most other cereals; it has higher levels of calcium, iron, zinc, lipids and high quality proteins. Nutritionally, pearl millet makes an important contribution to human diet due to high levels of calcium, iron, zinc, lipids and high quality proteins. Carbohydrates are the major component of pearl millet grains varying from 71.82 to 81.02 per cent [1]. Pearl millet usually has higher protein and fat content than sorghum or the other millets because the kernel is a naked caryopsis. Its protein content is not only high but also of good quality except for lysine deficiency [2]. Protein and fat content of pearl millet varieties vary from 12.25 to 13.09 per cent and 4.32 to 5.11 per cent, respectively [3].
The soyabean is a yellow vegetable that comes from China and constitutes the base of human and animal diets in many Oriental countries due to its high nutritional value and low cost. Moreover, soya products are increasingly being used in other countries because they are a good source of vegetable proteins, with a low fat content [4]. A functional food that combines many nutritional benefits of whole wheat supplemented with soya beans has been proposed to cater for a set of clientele whose health has been compromised such as those suffering from protein-energy-malnutrition, diabetes and obesity [5].
Bakery products account for a major part of the processed food industry. Bakery products are popular all over the world and the production has risen by many folds due to their low cost, varied taste and textured profiles with attractive package and longer shelf-life to suit easy marketing. Bakery products are usually made with wheat flour, due to its unique functional characteristics to develop a gluten network when it is mixed with water. This gluten formation is essential in producing good baked products and the quality of the bakery products depends largely on the wheat quality. It is possible to replace the wheat flour in bakery products to a certain degree by using other cereal grains, even though the presence of gluten forming proteins is a unique property of wheat flour. Rye, oats, millets and other cereals are used to a lesser extent to produce bakery products in some countries.
The use of millets in bakery products will not only give products superior in terms of fibre content and micronutrients but also create a good potential for millets to enter in the bakery world for series of value added products [6]. Bakery products are mostly prepared from the wheat flour but efforts are being made to replace few portion of it with millets in order to provide an alternative and reduce over dependence on wheat.

Perl millet flour can be incorporated in bakery items like biscuits, *nan-khatai*, chocolate, cheese, cakes, muffins, etc.

Materials and Methods

This study was carried out in Department of Foods and Nutrition, I.C College of Home Science, Chaudhary Charan Singh Haryana Agricultural University, Hisar.

Procurement of material

Three varieties of pearl millet viz. Bio-fortified (HC-20), white (WHC-901) and Grey (HHB-67 improved) were procured from Bajra section, Department of Genetics and Plant Breeding, CCS Haryana Agricultural University, Hisar.

For the preparation of *kulcha* the required ingredients namely, refined flour, soyabean flour, fat, sugar, yeast, salt, gluten and milk powder were purchased in a single lot from the local market of Hisar.

Nutritional evaluation of *kulcha* prepared from three varieties of pearl millet with incorporating soyabean flour

Moisture, crude protein, crude fat, crude fiber and ash were estimated by employing the standard methods of analysis [7]. Iron and zinc in acid digested samples were determined by Atomic Absorption Spectrophotometer according to the method [8]. Total calcium was determined calorimetrically by the method [9].

Results

Proximate composition

Data in respect to proximate composition of *kulcha* is presented in Table 1.

Table 1: Proximate composition of *kulcha* prepared from various varieties of pearl millet (g/100g, on dry matter basis)

Pearl millet variety for *kulcha*	Moisture*	Crude protein	Crude fat	Ash	Crude fibre
HC-20	27.68±0.60	14.26±0.15	9.23±0.28	1.95±0.10	0.80±0.06
HHB-67 improved	26.85±1.19	13.53±0.10	8.71±1.01	1.89±0.10	0.92±0.04
WHC-901	23.64±0.30	13.79±0.05	9.88±0.58	1.77±0.40	0.80±0.03
CD(P<0.05)	10.78	0.37	2.39	0.29	0.15

Values are mean ±SE of three independent determinations
Ratio of pearl millet flour: refined wheat flour: soya bean flour: 50:40:10
*Moisture as per fresh basis
Significant at 5% level

The moisture content of *kulcha* developed from HC-20, HHB-67 improved and WHC-901 was observed as 27.68, 26.85 and 23.64 g/100g, respectively (Table 1). Protein content of *kulcha* developed from HC-20, HHB-67 improved and WHC-901 *kulcha* was found as 14.26, 13.53 and 13.79 g/100g, respectively, on dry mater basis.

The fat content of *kulcha* made from HC-20 was 9.23 g/100g and in that made from HHB-67 improved was 8.71 g/100g, whereas, *kulcha* made from WHC-901 had 9.88 g/100g fat, on dry matter basis.

The ash content of pearl millet varieties was 1.95, 1.89 and 1.77 g/100g observed in *kulcha* developed from HC-20, HHB-67 improved and WHC-901, respectively (Table 1). The crude fibre content of *kulcha* made from HC-20, HHB-67 improved and WHC-901 was observed as 0.80, 0.92 and 0.80 g/100g respectively, on dry mater basis.

Total minerals

Data in respect to total calcium, iron and zinc contents of *kulcha* are presented in Table 2.

Table 2: Total mineral contents of *kulcha* prepared from various varieties of pearl millet (mg/100g, on dry matter basis)

Pearl millet variety for *kulcha*	Calcium	Iron	Zinc
HC-20	39.51±0.17	4.47±0.14	2.66±0.09
HHB-67 improved	40.35±0.54	3.57±0.25	1.84±0.08
WHC-901	39.57±0.86	3.16±0.10	1.36±0.04
CD(P<0.05)	2.06	0.61	0.35

Values are mean ±SE of three independent determinations
Ratio of pearl millet flour: refined wheat flour: soya bean flour: 50:40:10
Significant at 5% level

The concentration of calcium content in *kulcha* made from HC-20, HHB-67 improved and WHC-901 varieties of pearl millet was observed as 39.51, 40.35 and 39.57 mg/100g, respectively, on dry matter basis. The iron content of *kulcha* made from HC-20, HHB-67 improved and WHC-901 was observed as 4.47, 3.57 and 3.16 mg/100g, respectively (Table 2). The zinc content of *kulcha* prepared from HC-20, HHB-67 improved and WHC-901 was observed as 2.66, 1.84 and 136 mg/100g, respectively, on dry matter basis.

Discussion

The protein content of *kulcha* prepared from HC-20, HHB-67 improved and WHC-901 was found to be 14.26, 13.53 and 13.79 g/100g, respectively. The good amount of protein observed in *kulcha* prepared from all varieties of pearl millet may be attributed to addition of soyabean flour.

The fat content of *kulcha* prepared from HC-20 was 9.23 g/100g and in *kulcha* prepared from HHB-67 improved was 8.71 g/100g, whereas, *kulcha* prepared from WHC-901had 9.88 g/100g of fat content. Maximum amount of fat content was observed in *kulcha* prepared from WHC-901.

The ash content of *kulcha* prepared from HC-20, HHB-67 improved and WHC-901 was observed as 1.95, 1.89 and 1.77 g/100g, respectively (Table 1). The crude fibre content in *kulcha* prepared from HC-20, HHB-67 improved and WHC-901 was ranged between 0.68-0.80 g/100g. Similarly, Ndife and co-workers [10] prepared bakery products by using whole wheat and soyabean flour blends with levels of 10, 20, 30 and 40%. The proximate composition of bakery products showed an increase in range 11.0% for moisture, 4.37% for crude protein, 2.40% for fat, 2.35%for crude fibre and 0.85% for ash respectively, with progressive inclusion of the soyabean flour.

The concentration of calcium content in *kulcha* prepared from HC-20, HHB-67 improved and WHC-901 was to be observed almost similar as 39.51, 40.35 and 39.57mg/100g, respectively. The highest amount of iron was found in *kulcha* prepared from bio-fortified variety HC-20 (4.47 mg/100g) followed by *kulcha* prepared from HHB-67 improved (3.57 mg/100g) and WHC-901 (3.16 mg/100g). Similar to iron, the highest amount of zinc was found in prepared from bio-fortified variety HC-20 (2.66 mg/100g) followed by prepared from HHB-67 improved (1.84 mg/100g) and WHC-901 (1.36 mg/100g).

Conclusion

The *kulcha* prepared from three varieties of pearl millet with incorporating soyabean flour, the WHC-901 variety of pearl millet contains highest amount of protein and fat content as compare to other varieties. The highest amount of calcium found in *kulcha* prepared from HHB-67 improved variety of pearl millet whereas highest amount of iron and zinc found in HC-20 Bio- fortified variety of peal millet. Keeping in view the nutritional profile of pearl millet the development of these products will not only diversify the uses of pearl millet but also will be beneficial for human health.

References

1. Cheik QAT, Aly S, Yaya B, Alfred ST. A comparative study on nutritional and technological quality of fourteen (14) cultivars of pearl millet (*Pennisetum glaucum* (L.) Leeke) in Burkina Faso, 2006.
2. Gill KS. Pearl millet and its improvement. Publications and Information Division, ICAR, New Delhi, 1991, 1-7.
3. Abdalla AA, Ahmed UH, Ahmed AR, El-Tinay AH, Ibrahim KA. Physiochemical characterization of traditionally extracted pearl millet starches. J Applied Sci. Res. 2009; 5(11):2016-2027.
4. Steinke FH. Nutritional value of soybean protein foods. In: Waggle, D. H., Steinke, F. H., and Volgarev, M. N., Eds. New Protein Foods in Human Health: Nutrition, Prevention, and Therapy. Boca Raton, FL: CRC Press, 1992, 59-66.
5. Young J. Functional bakery products: current directions and future opportunities. Food Ind. J. 2001; 4:136-144.
6. Verma V, Patel S. Value added products from nutri-cereals: Finger millet (*Eleusinecoracana*). Emir. J Food Agric. 2013; 25(3):169-176.
7. AOAC. Official Methods of Analysis. Association of Official Analytical Chemist. Washington, D.C, 2012.
8. Lindsey WL, Norwell MA. A new DPTA-TEA Soil test for zinc and iron. Agron. Abst. 1969; 61:84-89.
9. Chopra SL, Kanwar JS. Analytical Agricultural Chemist, 4th edition, Kalyani Publisher, New Delhi, 1979.
10. Ndife J, Abdulraheem LO, Zakari UM. Evaluation of the nutritional and sensory quality of functional breads produced from whole wheat and soya bean flour blends. African Journal Food Science. 2011; 58:466-472.