Development of nutritive biscuits fortified with different level of chick pea milk cottage cheese

Kaushal Kishor, John David, Snehlata Tiwari, Ivan Wilson and Bhole Shankar

Abstract

Present study was to evaluate the impact of the chick pea milk added cottage cheese on the sensory quality of wheat flour biscuits which was prepared with different levels of chick pea milk added cottage cheese. Sensory quality was evaluated on parameters of colour and appearance, body and texture, taste and flavour and overall acceptability by using 9 point hedonic scale. There were three treatment’s which were replicated four times. Using wheat flour (90%, 85%, 80%) and chick pea milk added cottage cheese (10%, 15%, 20%) to assess the sensory acceptability of the best treatment. Ti (wheat flour 90% C.P cottage cheese 10%) was found to be the best i.e. 8.5 for colour and appearance and 8.0 for body and texture and best flavour score was 7.50 and overall acceptability was found better for Ti.

Keywords: Wheat flour, biscuits, chickpeamilk cottage cheese, sensory quality.

Introduction

Biscuits are a popular foodstuff consumed by a wide range of population due to their varied taste, long shelf life and relatively low cost. Because of competition in the market and increased demand for healthy, natural and functional products, attempts are being made to improve the nutritive value of biscuits and functionality by modifying their nutritive composition. Such effects are very often achieved by increasing the ratio of raw materials other than wheat or different types of dietary fibers in basic recipes with the attempt to increase biscuit’s protein and mineral content for quality and availability (Tyagi et al., 2006, Lubna Masoodi et al., 2012) or increase dietary fiber content and improve prebiotic characteristics of the final product (Gallagher et al., 2003, Lubna Masoodi et al., 2012).

Cottage cheese is a product of fresh cheese curd that has been drained. The process of draining allows the whey to remain in the product which gets its high protein content and also why cottage cheese is white in color. It does not undergo aging and wased to give its different taste, sweet and mildly flavor. According to ideal standards for cultured dairy products, the ideal creamed cottage cheese (full fat) flavor should be fresh, pleasant, and clean, with slight acidity and mild diacetyl flavor with no after taste. Ideal cottage cheese curds should be uniform, and with a meaty texture without being too firm, rubbery, or tough.

There are many types of cheese and can mostly be classified as soft, semi hard or hard cheese, depending upon the moisture content. The soft cheese contains 45 to 80% moisture and perishable. The hard and semi hard cheese contain from 30 to 45% moisture and under favorable conditions may be store for a year or more. Cheese may be ripened or unripened. Some well known example of cheese is cottage and mozzarella cheese as unripened soft cheese. Roquefort and brick as ripened semi-soft and cheddar as ripened hard. In India however cheddar cheese processed cheddar cheese or unripened cheese are more popular. Chickpea is valued for its nutritive seeds with high protein content, 25.3-28.9%, after dehulling (Hulse, 1991). Chickpea seeds are eaten fresh as green vegetables, parched, fried, roasted, and boiled; as snack food, sweet and condiments; seeds are ground and the flour can be used as soup, dhal, and to make bread; prepared with pepper, salt and lemon it is served as a side dish (Saxena, 1990). Dhal is the split chickpea without its seedcoat, dried and cooked into a thick soup or ground into flour for snacks and sweetmeats (Saxena, 1990; Hulse, 1991). Supplementation of wheat flour with chick pea would significantly enhance the protein quality of the product (Hernandez and Sotelo, 1984) [6]. The crude protein content of chick pea seeds ranged from 15-30% and it is considered one of the best nutritional quality in the legume family (Chavan et al., 1987) [1].
Chick pea flour can be used to enrich cereal flours without impairing flavor, baking quality (Hernandez and Sotelo 1987) [7].

In addition to being an important source of protein, chick pea is also reported to be a good source of minerals (Nestures et al., 1997) [14]. It supplies consumers with larger amounts of calcium and phosphorus than does other legumes (Mataix et al., 1995; and Teresa et al., 1999) [11,12].

Dodok et al. (1993) [2] stated that bread and biscuits containing 10-20% chick pea meal had acceptable quality and higher nutritional value than those made from wheat flour alone. The amino acid composition of chick pea was assessed by Fiorenteni et al. (1981) [9], Sotelo and Adsule (1996), Youssef (2003), Alarcon-Valdez et al. (2005) and Noor et al. (2012) [13].

Furthermore, chick pea is considered of good source of vitamins (Dodok et al., 1993) [2]. Chick pea adjusts blood glucose content in diabetic patients since it affects the relative glycemic response (Hawkins and Johnson, 2005).

This investigation was designed to produce fortified wheat biscuits, which has better nutritional value, available and relatively cheap and does not require any preparation efforts before use. The objective of this investigation was to study the development of high nutritive value and sensory characteristics in wheat flour biscuit fortified with different level of chick pea milk added cottage cheese.

Materials and Methods

The experimental work was carried out in the research laboratory of department of Dairy, Technology, Warner college of Dairy Technology, Sam Higginbottom university of Agriculture, Technology and Sciences, Allahabad. Wheat flour and chick pea, skim milk were obtained from the local market of Allahabad city. Cottage cheese was prepared by skim milk and different levels of chick pea milk. Numbers of treatment were 3 which were replicated 4 times. The product was evaluated organoleptically by a panel of judges with the help of nine point hedonic scale. (Sri Lakshmi, 2006)

Treatment Details

T1 = biscuits prepared from wheat flour (90%) with addition of (10%) chick pea milk added cottage cheese.

T2 = biscuits prepared from wheat flour (85%) with addition of (15%) chick pea milk added cottage cheese.

T3 = biscuits prepared from wheat flour (80%) with addition of (20%) chick pea milk added cottage cheese.

Result and Discussion

For the sensory analysis it was found that the highest score was observed in treatment T1 in which value added biscuit’s prepared by (wheat flour 90%and chick pea milk added cottage cheese with addition 10%).

Colour and Appearance

The sensory score of colour and appearance of the formulated product clearly indicated that treatment which had combination of wheat flour (90%) chick pea milk added cottage cheese (10%) had the significantly highest score followed by T1 (8.5) and T2 (8.3) and T3 (8.1). thus making it quite obvious that the addition of wheat flour and C.P.M. cottage cheese increased the colour and acceptability of value added biscuits. A numerical hedonic scale ranging from 1 to 9 (1 is very bad and 10 for excellent) was used for sensory evaluation (Larmond, 1977). Ten experienced judges participated in the test.

Body and texture

Average sensory scores of body and texture of the formulated product clearly indicated that treatment T1 biscuits prepared from wheat flour (90%) with addition of (10%) chick pea milk added cottage cheese had the highest score followed by T1 (7.5) and T3 (7.4) and T3 (7.2). thus making it quite obvious that the addition of wheat flour and C.P.M. cottage cheese (10%,15%,20%) improve the body and texture of value added cottage cheese (table.1).The result are in agreement with Smith et al.,(2005).

Flavour and taste

The treatment T1(7.50) which had combination of biscuit wheat flour 90% and C.P.M. cottage cheese 10% had a highest scored followed by T3 (7.50) and T3 (7.40). Thus making it quite obvious that the addition wheat flour 90% and chick pea milk added cottage cheese is 10% improve the taste and flavour of value added cottage cheese. the variation in flavour and taste was probably due to the effect of some development of chemical (Kosikowski, 1997) [8, 10].

<table>
<thead>
<tr>
<th>Biscuit Samples</th>
<th>Colour And Appearance</th>
<th>Body And Texture</th>
<th>Flavour And Taste</th>
<th>Overall Acceptability</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>8.5</td>
<td>7.5</td>
<td>7.50</td>
<td>8</td>
</tr>
<tr>
<td>T2</td>
<td>8.3</td>
<td>7.40</td>
<td>7.50</td>
<td>7</td>
</tr>
<tr>
<td>T3</td>
<td>8.1</td>
<td>7.20</td>
<td>7.40</td>
<td>7</td>
</tr>
</tbody>
</table>

Overall acceptability

The average sensory score of body and texture of formulated product clearly indicated that treatment T1 (8.0) which had combination of biscuit wheat flour 90% and C.P.M. cottage cheese 10% had highest score T1 (8) and T2 (7) and T3 (7). This making it quite obvious that the addition of wheat flour (90%) and chick pea milk added cottage cheese (10%) improves the overall acceptability of value added.

Body of The product

![Fig 1: T1 biscuits prepared from wheat flour (90%) with addition of (10%) chick pea milk added cottage cheese.](image-url)
Fig 1.2: T2 biscuits prepared from wheat flour (85%) with addition of (15%) chick pea milk added cottage cheese.

Fig 1.3: T3 biscuits prepared from wheat flour (80%) with addition of (20%) chick pea milk added cottage cheese.

Conclusion
In conclusion 10% chick pea milk added cottage cheese fortified with wheat flour biscuits provide to be nutritious functional and healthful food. It could be preferred for low caloric reduced food diabetic, obese and high weight persons, as well as for child nutrition.

References