The Pharma Innovation Journal 2023; 12(5): 1491-1493

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; 12(5): 1491-1493

www.thepharmajournal.com
Received: 21-02-2023
Accepted: 24-03-2023

Komal Ojha
Department Food, Nutrition and Public Health, Ethelind College of Community Science, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj, Uttar Pradesh, India

Anisha Verma
Department Food, Nutrition and Public Health, Ethelind College of Community Science, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj, Uttar Pradesh, India

Corresponding Author:
Komal Ojha
Department Food, Nutrition and Public Health, Ethelind College of Community Science, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj, Uttar Pradesh, India

Physico-chemical parameters and sensory characteristics of biscuits incorporated with sugarcane bagasse powder

Komal Ojha and Anisha Verma

Abstract
Sugarcane bagasse is an insoluble dietary fiber-rich byproduct of sugarcane processing. The goal of this study was to create biscuits with added sugars that were enriched with sugarcane bagasse as a fibre source. From a jaggery production facility, bagasse, either with or without peel, were gathered and crushed, sieved, dried, and processed again to create powder. The objective of the current study is to assess the sensory evaluations and proximate composition of biscuits containing 10%, 15%, and 20% sugarcane bagasse powder. Analyzed were the approximate contents of the biscuits carbohydrate, protein, fat, energy, fibre, and ash made with and without sugarcane bagasse powder. With an overall acceptability score of 8.73 on a scale of 9 points, the biscuits made with sugarcane bagasse powder (15%) obtained the highest sensory rating among the treatments.

Keywords: Sugarcane bagasse, by products, biscuits, value- addition proximate, sensory score

Introduction
The fibrous remains collected following the crushing and extraction of sugarcane to recover the sugar juice is known as bagasse. Insoluble dietary fibres are abundant in sugarcane bagasse, a byproduct of sugarcane processing. The study's main objective was to produce sugar-sweetened biscuits that were enhanced with sugarcane bagasse as a source of fibre. To make the powder, bagasse were gathered from a jaggery production facility and then dried, powdered, and sieved. In order to create biscuits, these three kinds of bagasse powder were enhanced at ratios of 0% (control), 10%, 15%, and 20% (w/w). The overall acceptance of the 15% bagasse with peel enriched biscuits was greater than that of the other. Overall, the findings suggest that it is acceptable to use sugarcane bagasse (with peel at 15%, w/w) in the production of biscuits.

The most frequent causes of the rise in diabetic-like disorders nowadays are the use of high-sugar, high-glycemic-index (GI), and highly processed (low-fiber) meals, as well as insufficient exercise (Kurek and Wyrwisz, 2015) [5]. People frequently utilise biscuits as ready-to-eat meals due to their hectic lifestyles. Biscuits often have lower fibre contents. However, frequent use of low-fibre dietary items poses a threat of rising non-communicable disease rates. In most countries, biscuits are one of the most popular ready-to-eat, affordable, and practical food products that are enjoyed by people of all ages (Usman *et al*., 2015) [7]. These biscuits are regarded as the most popular bakery goods due to their excellent nutritional content, ready-to-eat status, and simplicity in obtaining them in a variety of sizes and shapes at a low price. Biscuits and other sweet baked products are often avoided by calorie-conscious customers because of their high fat and sugar content, particularly sucrose. Improvements or modifications to the primary ingredients, such as flour, sugar, and fat, as well as the addition of health-promoting ingredients like whey protein concentrate, skimmed milk powder, and dietary fibres, can change or improve the functional properties of biscuits (Aggarwal *et al*., 2016) [1]. According to market demand, food scientists are currently concentrating on producing low-calorie, high-fiber functional meals that incorporate plant sources, such as biscuits (Aggarwal *et al*., 2016) [1] and dairy products, such as drinking yoghurts (Wijesinghe *et al*., 2018) [8], among others. Thus, creating biscuits with food fibres added is a major trend in the baking sector.

Material and Method

Standardization of biscuits: With the objective to develop value-added biscuits, all ingredients such as sugarcane bagasse, salt, flour, baking powder, sugar and remaining components were added in the amounts necessary to make biscuits. Biscuits (control and sugarcane bagasse powder incorporated) were developed by incorporating sugarcane bagasse powder in flour concentrations i.e 10%, 15%, 20% (Table 1).

Table 1: Treatment for Biscuits

Control &Treatments	Refined flour (%)	Sugarcane bagasse flour (%)	Oats flour (%)
T_0	100	-	
T_1	85	10	5
T_2	80	15	5
T_3	70	20	10

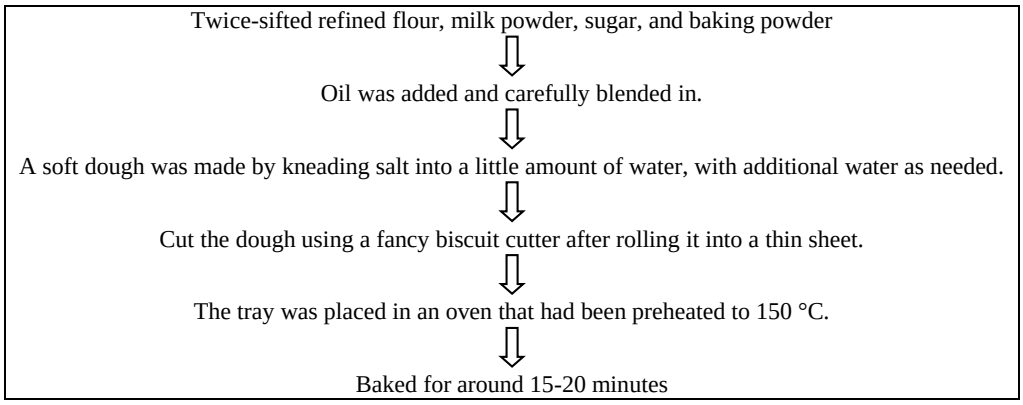

Fig 1: Flow diagram of biscuits preparation

Moisture: Moisture content was calculated via the method of AOAC (2007) [2].

Protein: Protein content was probable by Lowry's method. To assess the protein concentration of enzyme extracts, it is frequently used.

Fat: Using the Soxhlet method, the fat content of all samples was estimated.

Ash: Ash substance of the sample was determined by using muffle furnace method of AOAC (2007) [2].

Fibre: The acid-alkali digestion method was used to assess the fibre content.

Carbohydrate: By using the Anthrone method, the sample's carbohydrate content was determined.

Carbohydrate content (g/100 g) = 100-(moisture + protein + crude fibre + fat + ash)

Energy: The sample's energy value was calculated using the physiological fuel value per gramme of protein, fat, and carbohydrate.

Energy content (kcal/100 g) = (% protein × 4) + (% carbohydrate × 4) + (% fat ×9)

Sensory evaluation

A panel of judges conducts a sensory assessment of the food products to determine their acceptability. For the sensory assessment of the goods, a scorecard based on the 9-point Hedonic scale was utilised. On the basis of the score card, many characteristics of the produced items were examined, including their colour and look, body and texture, flavour, and general acceptance (Gopalan *et al*., 2004) [3].

Statistical Analysis

The data were analysed using the analysis of variance methodology (ANOVA), the critical difference, and other suitable statistical methods, and the results were interpreted. (Gupta *et al*., 2009) [4].

Result and Discussion

Mean score for sensory assessment of biscuits made from sugarcane bagasse powder

Table 1 The mean scores of overall acceptability show that T2 (8.73) had the highest score, followed by T1 (8.03), T3 (7.2), and T0 (7.9). The scoring indicates that T2 was' very much liked,' while T1, T3, and T0 were' moderately liked' by the panel of judges. A pre-evaluation, all the sensory parameters were found to be highly acceptable between 'like very much' (rating 8) to 'like moderately' on 9 point Hedonic rating scale. The mean scores of 7.8 to 7.57 for colour and appearances, 7.6 to 7.16 for body and texture, 7.83 to 7.1 for taste and flavor, 7.9 to 7.2 for overall acceptability.

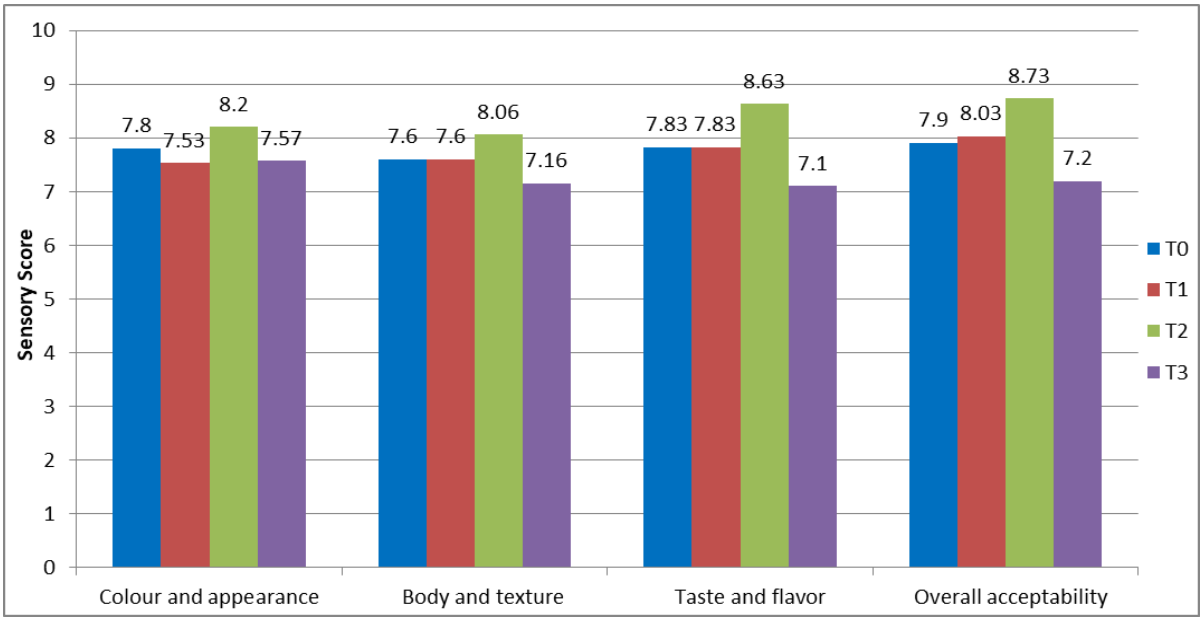

Fig 2: Mean score for sensory assessment of biscuits made from sugarcane bagasse

Significant changes between the control and treatment were found (p 0.05).

Proximate composition of sugarcane bagasse incorporated biscuits

The nutrient composition of control biscuits was obtained to be 23.7 percentage moisture, 12 percentage protein, 21.1 percentage fat, 96 percentage carbohydrate, 0.3 percentage crude fibre, 627 kcal energy. Whereas sugarcane bagasse powder incorporated biscuits was 12.2 percentage moisture, 10.5 percentage protein, 21.2 percentage fat, 80 percentage carbohydrate, 6.9 percentage crude fibre, 558 kcal energy. Some variation in the nutrient content of the made products. These resulted from the different sugarcane bagasse flour inclusion. There was a significant increase in moisture, carbohydrates, crude fibre, and dietary fibre. All the nutrients were significantly increased in the best treatments with the sugarcane bagasse flour as compared to the control without sugarcane bagasse flour. Energy, protein, fat was decreased the best treatments with the sugarcane bagasse flour as compared to the control without sugarcane bagasse flour.

Conclusion

Sugarcane bagasse powder combined fibre rich biscuits can be a better easy for enriching the quality of biscuits. Sugarcane bagasse mixed biscuits are rich in flavour. In comparison to other treatment combinations, the results showed that sugarcane bagasse that was included at a rate of 15 percent had the greatest overall quality throughout storage. Biscuits made with sugarcane bagasse powder are higher in fibre, protein, and calories than regular biscuits and are also substantially more nutrient rich.

Future scope

Sugarcane bagasse powder may be added to bakery and confectionery goods at the industrial level as a cost-effective way to increase the products' sensory acceptance as well as their nutritional values, such as their fibre, calcium, and iron content. Along these lines, it may be suggested that its usage in baked goods may serve to lessen the drawbacks of refined flour in baked goods.

Acknowledgement

This study was supported by Nutrition Research Laboratory of the Department Food, Nutrition and Public health, Ethelind College of Home Science, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj.

References

1. Aggarwal D, Sabikhi L, Kumar MHS. Formulation of reduced-calorie biscuits using artificial sweeteners and fat replacer with dairy-multigrain approach. NSF Journal. 2016;2:1-7.
2. AOAC. International. Official Methods of Analysis, 18th edition, Association of Official Analytical Chemists, Washington. DC; c1995.
3. Gopalan C, Ramasastriand BV, Balasubramanian SC. Nutritive value of Indian Foods. National Institute of Nutrition (NIN). Indian Council of Medical Research, Hyderabad. 2004;13:59-67.
4. Gupta SC, Kapoor UK. "Fundamental of Applied Statistical" 2th edition, chand and son, 2009, 51-85.
5. Kurek M, Wyrwisz J. The application of dietary fibre in bread products. Journal of Food Processing & Technology, 2015, 6.
6. Lowery's. Estimation of protein, bioseparation Technology Laboratory; c1951
7. Usman GO, Ameh UE, Alifa ON, Babatunde RM. Proximate composition of biscuits produced from wheat flour and maize bran composite flour fortified with carrot extract. Journal of Nutrition & Food Sciences, 2015, 5.
8. Wijesinghe JAAC, Wickramasinghe I, Sarananda KH. Optimizing organoleptic properties of drinking yoghurt incorporated with modified kithul (*Caryota urens*) flour as a stabilizer and evaluating its quality during storage. Vidyodaya Journal of Science. 2018;21:36-48.