

Acceptability studies of pineapple pomace powder enriched biscuit

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Abstract

Pineapple is one of the popular fruits and is liked by majority of the people irrespective of their age group. In the present experiment, product of pineapple pomace powder was prepared with different combinations of pineapple pomace powder and other ingredients such as edible sugar, shortening, milk and baking powder. In the preparation of nutritional enrichment studies in biscuits incorporating pineapple pomace powder composed of T₁ (100% APF), T₃ [87.5% all-purpose flour (APF) +7.5% pineapple pomace powder (PPP) + 5% defatted soya flour (DSF)], T₄ [85.0% all-purpose flour (APF) +10% pineapple pomace powder (PPP) + 5% defatted soya flour (DSF) and T₅ [82.5% all-purpose flour (APF) +12.5% pineapple pomace powder (PPP) + 5% defatted soya flour (DSF)] were found optimum by scoring maximum by sensory properties.

Index terms: Pineapple pomace powder, Sensory properties, Baking powder, Shortening and all-purpose flour

Introduction

Bakery products provide best structure by which functionality can be provided to the customers in a suitable food. Baked products are most widely consumed food item in the world. So, they can be utilized as nutritional tool to carry the nutrients to body (Younas *et al.*, 2015). The bakery industry is growing very fast and the products are increasingly becoming popular among all sections of people. Among ready to-eat snacks, biscuits possess several attractive features including wider consumption base, relatively long shelf-life, more convenience and good eating quality (Hooda and Jood, 2005). Most of bakery products are used as a source for incorporation of different nutritionally rich ingredients for their diversification. This approach not only promotes development of diversified and nutrient rich bakery products but also reduces over exploitation and excessive use of wheat for making bakery products. Majority of bakery products are high in carbohydrate, fat and calorie, but low in fibre content. These characteristics made them as unhealthy choices for daily

consumptions. By-products with rich source of fibre can be used in bakery products, because they are less expensive and non-calorie bulking agents which enhance the oil and water retention and improve the oxidative and emulsion stabilities (Elleuch *et al.*, 2011). In recent years, foods are not anticipated to only satisfy hunger needs and to deliver essential nutrients to people but also to avoid nutrition-related diseases and enhance physical and mental comfort of the people. Utilization of dried pineapple pomace powder therefore holds a significant promise in improving nutritional quality in general and fibre content of baked products in particular to a greater extent. The present investigation was therefore carried out to incorporate dried and powdered pineapple pomace powder into biscuits as a rich source of potential fibre and to study the effect of incorporation on its sensory characteristics.

Materials and methods

Sensory Evaluation

Sensory evaluation of “nutritional enrichment studies in biscuits by incorporating pineapple pomace powder” was carried out by 10 semi trained panel consisting of a teacher and Post-Graduate students of College of Horticulture, Bagalkot with the help of nine point hedonic scale (1= dislike extremely, 2= dislike very much, 3= dislike moderately, 4= dislike slightly, 5= neither like nor dislike, 6= like slightly, 7= like moderately, 8= like very much and 9= like extremely) for Colour, flavor, taste, consistency and overall acceptability (Swaminathan, 1974). The products along with control were coded and served randomly to the panelist for sensory evaluation immediately after preparation.

Statistical analysis

The data on sensory evaluation, quality analysis and storage studies of nutritional enrichment studies in biscuits and bread by incorporating pineapple pomace powder was carried out by using Completely Randomized Design (CRD) analysis using WASP software and Factorial Completely Randomized Design (CRD) using Window Stat software.

Results and discussion

Sensory evaluation of pineapple pomace enriched biscuits

Significant differences were observed for variables such as colour, flavour, taste, texture and overall acceptability for pineapple pomace enriched biscuits (Table 1 and Fig 1). The mean score for colour of pineapple pomace enriched biscuits ranged from 8.66 to 6.31, flavour 7.99 to 5.80, taste 8.06 to 6.00, texture 8.13 to 7.01 and overall acceptability 8.31 to 6.57. The highest score recorded in T₅ (82.5% APF +12.5% PPP + 5% DSF) and lowest score was observed in T₉ (72.5 APF +22.5% PPP + 5% DSF) on a nine point scale for different attributes indicating that products were acceptable for all the attributes studied.

Ranking of treatments

Table 1 predicted that the ranking for all the treatments of nutri-enriched pineapple pomace powder biscuits were values for sensory evaluation viz., colour, flavour, taste, texture, overall acceptability. Among all the treatments T₅ (82.5% APF +12.5% PPP + 5% DSF: 8.23) ranks 1st with average score of followed by T₄ (85% APF +10% PPP + 5% DSF: 7.82) and T₁ (100% APF: 7.80).

Table 3: Effect of treatments on sensory attributes of pineapple pomace enriched biscuits

Treatments	Sensory attributes (* Score out of 9)					
	Colour*	Flavour*	Taste*	Texture*	Overall acceptability*	Rank
T1 :100% APF	7.65 ^{bc}	7.15 ^c	7.81 ^b	7.76 ^{abc}	7.89 ^c	3
T2 : 90% APF +5% PPP + 5% DSF	7.41 ^{cd}	7.92 ^a	7.32 ^c	7.48 ^{bcde}	7.22 ^e	5
T3 : 87.5% APF +7.5% PPP + 5% DSF	7.75 ^b	7.83 ^{ab}	7.81 ^b	7.56 ^{bcd}	7.91 ^{bc}	4
T4 :85 % APF +10% PPP + 5% DSF	7.79 ^b	7.44 ^{bc}	8.00 ^{ab}	7.81 ^{ab}	8.07 ^b	2
T5 :82.5 % APF +12.5% PPP + 5% DSF	8.66 ^a	7.99 ^a	8.06 ^a	8.13 ^a	8.31 ^a	1
T6 :80 % APF +15% PPP + 5% DSF	7.19 ^{de}	6.31 ^d	6.46 ^d	7.43 ^{cde}	7.53 ^d	6
T7 : 77.5% APF +17.5% PPP + 5% DSF	6.90 ^{ef}	6.30 ^d	6.51 ^d	7.21 ^{def}	7.31 ^e	7
T8 :75% APF +20% PPP + 5% DSF	6.68 ^f	6.20 ^d	6.17 ^e	7.11 ^{ef}	6.91 ^f	8
T9 :72.5 % APF +22.5% PPP + 5% DSF	6.31 ^g	5.80 ^e	6.00 ^e	7.01 ^f	6.57 ^g	9
Mean	7.37	6.98	7.13	7.50	7.53	
SEm±	0.10	0.13	0.06	0.12	0.07	
CD at 1%	0.40	0.53	0.32	0.50	0.24	

(Different subscripts indicates significant differences within column)

Discussion:

Sensory evaluation of product is an important tool for deciding the consumer acceptability. Here biscuits were prepared by incorporating pineapple fruit pomace powder (PPP), defatted soy flour (DSF) as well as all purpose flour (APF) at different levels (0-22.5%, 5% and 100 to 72.5% respectively). Sensory evaluation of the developed biscuits was carried out by using 9 hedonic scale by the panel of the judges. Inclusion of different ratio of pineapple fruit pomace powder, in biscuits resulted in significant effect on sensory characteristics of biscuits.

Significant differences were observed for variables such as colour, flavour, taste, texture and overall acceptability for pineapple pomace enriched biscuits. As the percentage of pineapple pomace powder increased, the colour, flavour, taste, texture and overall acceptability of biscuits were appreciated up to certain level beyond which scores for these sensory parameters significantly decreased. Wheat (*Triticum aestivum*), and Aswagnadha (*Withaniasomnifera*) were cleaned, dried, milled and mixed to produce composite flour. The

amount of wheat, finger millet and fenugreek powder used to make composite mix blend diet was 70, 70 and 15 g each respectively (Teradal *et al.*, 2017). Increase in PPP in the biscuits beyond certain level lead to browning reactions such as caramelization and Maillard reaction which might have adversely affected the colour and typical flavour of biscuits. Consequently, biscuits became bitter in taste and developed hardness finally leading to decrease in the overall acceptability score. However, the highest score was recorded in T5 (82.5% all-purpose flour +12.5% pineapple pomace powder + 5% defatted soya flour) and this may be due unique colour (due the presence of carotene), flavour (volatile compounds such as esters, terpens, aldehydes and ketones) and taste of the pineapple fruit.

The lowest score was observed in T₉ (72.5 APF +22.5% PPP + 5% DSF). The lower score for various sensory attributes and overall acceptability in this treatment was mainly due excessive sugars of pomace powder leading to unacceptable level of browning caused by Maillard reaction (sugars and amino acids) and caramalization (burning of sugars) during the baking process. Also authors quoted that the dextrinization of starch or Maillard reactions involving in the interaction of reducing sugars with protein (Baljeet *et al.*, 2014). Harish *et al.*, 2022 studies shows that that the incorporation of pomegranate seed powder and defatted soybean flour up to 20% and 30%, respectively in cookies formulation were accepted at optimum level for all sensory parameters like taste, flavor and texture except for color

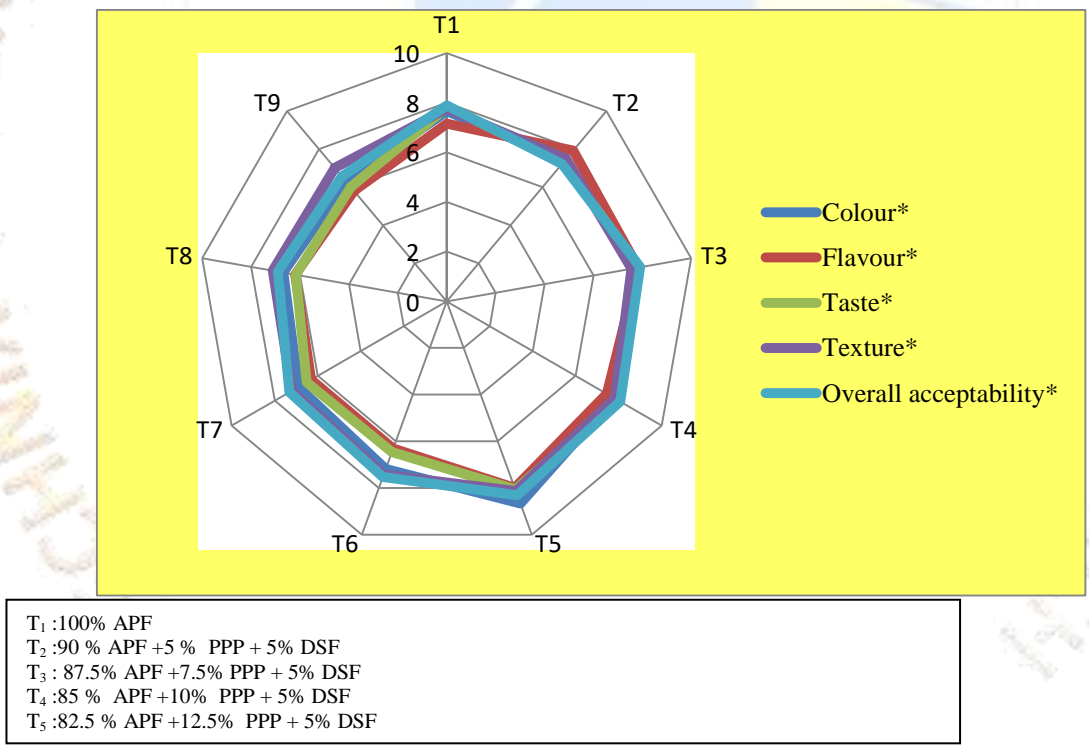


Fig. 1: Effect of treatments on sensory attributes of pineapple pomace enriched bread

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