Improvement of productivity of soft dough biscuits by regulating temperature and quantity of the palm olein

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Introduction

Biscuit is a small baked product made principally from flour, sugar and fat (Sonia *et al*., 2007). According to the type of the dough biscuits can be categorized as soft dough and hard dough biscuits. Analysis and quantification of the quality, for the purpose of controlling its parameters and acting on it in real time, remain the prime objectives of the biscuit industry. Palm olein is widely used in food manufacturing industry due to its good resistance to oxidation and formation of breakdown products at frying temperatures and longer shelf life of finished products.Usage of palm olein to build up the specific quality on soft dough biscuits is a major concern in the manufacturing plant. In order to maintain the given specification currently add high amount of oil to the dough. Addition of high amount of olein will increase the cost of production. As well palm olein temperatures also contribute to the quality characteristics of final output. Therefore prime objective of this study is to investigate the impact of the palm olein temperature and quantity on soft dough biscuits (Milk Shorties) without compromising the quality of biscuits thereby reducing the cost of production.

Materials and Methods

Two factors, palm olein quantity and palm olein temperature and their combinations were used to test the effect for the final biscuit quality. In order to study the influence of temperature regulation (34 °C, 32 °C and 30 °C) and the amount of the incorporated palm olein (56 kg, 54 kg, 52 kg and 50 kg) on the biscuit characteristics; twelve different treatments were conducted. Palm olein temperature was regulated by using the oil heating system in mixing area. Moreover, all twelve treatments were subjected to similar conditions until biscuits were packed.Samples were collected from three dough of each combination by using simple random sampling method. There were three replicates per each twelve treatments.All treatments were subjected to detect the objective quality characteristics such as raw weight, baked weight, baked height, moisture content (Infra-red moisture analyzer), pH, hardness, total fat content (Soxhlet extraction method) and packet weight. Out of the twelve treatments the best treatment was chosen for the sensory evaluation by 30 untrained panelists.

Results and Discussion

The effect on twelve different treatments for biscuit quality parameters shown in the Table 1. According to the results with the reduction of amount of palm olein the raw weight, baked weight, moisture content and total fat content of biscuits were gradually decreased while increased the baked height and the hardness of the biscuits.Weight and height were found to be

quite sensitive to the sugar and fat levels of the biscuits (Cronin and Preis, 2000). As well results showed that the amount of palm olein significantly influenced final quality of biscuit(Dunken, 2000). According to the research results, treatment combination which included 54 kg of palm olein at 32 ℃ temperature was the best treatment among all other twelve treatments combinations. Because the biscuits produced from this treatment have the same quality of Milk Shorties biscuits available in the market. Sensory attributes of colour and taste showed that biscuit produced with reduced amount of palm olein (54 kg) was not perceived when tested by sensory panel. Moreover sensory evaluation results showed that overall consumer acceptability of designated sample and formulated sample are much more similar. Therefore T5 treatment, compromised with 54 kg of palm olein, with 32 □C of temperature was selected as the best treatment by the sensory evaluation and the product had raw weight 56.33 g, baked weight 47.09 g, baked height 60.9 mm, moisture content 2.62 % (db), pH 7.07, hardness 10.97 N, total fat content 15.54 % and packet weight 365.4 g. This treatment combination is important to improve the productivity of the milk shorties biscuit and reduce the cost of production. Thereby increase the profit. Value to reduce the 2 kg of palm olein (per dough) in annum is Rs. 2.8 million.

Table 01: Mean values of four different treatments on biscuit parameters

	Raw weight	Baked weight	Baked height	Moisture content	pH	Hardness	Total fat content	Packet weight
Standard range	54-58 g	46-48 g	58-61 mm	2-3%	6.9-7.1	9-11	15-17%	350-365g
T1	57.51±0.533	47.25±0.254	59.33±0.208	2.59±0.028	7.01±0.013	9.99±0.110	15.59±0.014	378.13±2.150
T2	57.68±0.150	47.61±0.911	59.56±0.416	2.66±0.026	7.02±0.022	9.87±0.220	15.62±0.025	375.4±
T3	57.88±0.458	48.01±0.768	60.36±0.667	2.73±0.062	7.05±0.017	9.79±0.230	15.59±0.016	370.12±3.618
T4	56.33±0.742	46.91±0.177	60.76±0.577	2.59±0.092	7.05±0.016	10.99±0.408	15.51±0.008	365.4±
T5	56.40±0.978	47.09±	60.9±0.793	2.62±0.098	7.07±0.020	10.97±0.322	15.54±0.073	362.76±3.163
T6	56.96±0.799	47.19±1.064	61.66±0.251	2.73±0.096	7.08±0.022	10.88±0.225	15.51±0.032	360.2±
T7	55.33±1.033	45.49±0.874	62.10±0.551	2.54±0.092	7.06±0.022	11.56±0.206	15.39±0.037	358.9±
T8	56.08±1.008	46.25±	62±0.30550	2.61±0.094	7.07±0.026	11.53±0.407	15.49±0.041	354.32±5.393
T9	56.38±1.070	46.55±0.457	62.2±0.3	2.65±0.099	7.07±0.020	11.28±0.341	15.41±0.043	350.82±4.425
T10	55.22±0.844	44.36±	62.05±0.769	2.56±0.093	7.04±0.020	11.74±0.206	15.31±0.038	348.92±4.464
T11	55.54±0.937	44.59±0.148	62.3±0.244	2.59±0.091	7.07±0.028	11.64±0.450	15.35±0.019	345.16±5.3029
T12	55.63±0.803	45.47±0.113	63.03±0.251	2.61±0.098	7.08±0.023	11.60±0.560	15.13±0.019	340.24±6.710

Conclusions

54 kg of palm oleinat 32□C is the best treatment to obtain Milk shorties biscuits cost effectively and without compromising final quality of the biscuits.

References

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