

Preparation of Laminated Baked Product Using Oats

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Abstract

The following study involved the standardization of a procedure for the preparation of Laminated Baked Product with Oats. Normal and the oats product were manufactured by using maida, dalda and other raw materials. Two different samples were made - first using normal baked product and the other by the addition of oats. These products were baked at a temperature of upto 250°C. In all cases 1000 g of maida exclusive of other ingredients and the final product or yield of 1.5 kg. The dough was prepared by planetary mixer for half an hour and then baked. Sensory evaluation and comparative study of quality characteristics was carried out for the samples made. Comparative study was done between the two samples to evaluate the best and the cost estimation for both the samples was calculated.

Keywords: Lamination; Oats; Standardization; Planetary mixer

Introduction

A laminated baked snack bar consists of alternating layers of a shortening laminated between the layers of dough. The dough layers of the snack bar have a crunchy, cracker-like texture while the filling layer remains soft. The total thickness of the baked snack bar is preferably less than 7 millimeters. The snack bar is prepared by calibrating dough sheets to a thickness of less than 1 millimeter each, followed by depositing a filling composition having a high heat resistant stability on one of the calibrated dough sheets and placing a second calibrated dough sheet on top of the filling to form a laminate [1]. The laminate is then calibrated, cut into bars and baked, using a mild baking profile. The snack bar may have a design molded on the top surface and/or a topping composition, preferably including oats, deposited on the laminate.

A baked snack bar comprising: a first dough layer; a second dough layer, the first and second dough layers each comprising wheat flour, modified starch and enzyme; dough layers each have a cracker texture.

The baked snack bar further composition comprising Oats. The baked snack bar wherein none of the filling layer, first dough layer or second dough layer contains shortening (Baker's Data) that includes trans fat [2]. The baked snack bar wherein the bar has a moisture content of between about 8% and 10%. The baked snack bar of Oats wherein the thickness of the bar is less than 7 millimeters.

A method for making a baked Oats bar comprising: providing calibrated dough layer; depositing a filling on the calibrated dough layer [3], the filling comprising a resistant heat stability of at least 90%; placing the first calibrated dough layer on top of the filling to form a laminate; calibrating the laminate to reduce the thickness of the laminate into bars; and baking the bars, followed by slowly increasing the temperature to between about 210 - 250°C; wherein the layers are visible and extends substantially to all of the edges of the dough layers of the baked bars.

Composition of oat

Lamination is the process of creating a laminate, which is an item that has two or more layers joined together [4]. In the food industry, a laminated layers of dough sheets. Thus, while snack food structures and compositions according to the prior art provide a number of advantageous features, they nevertheless have certain limitations. For

example, a common problem with laminated, filled food products, such as snack bars, is that moisture from the filling is often absorbed by the adjacent dough layers [5]. This is normally undesirable as the dough layers become soggy. The present invention seeks to overcome certain of these limitations and other drawbacks of the prior art, and to provide new features not here to fore available. Accordingly [6], it is desirable to provide a laminated snack bar that simultaneously includes cracker-like layers of dough and a moist middle layer of the baked snack bar. Additional the invention or of certain embodiments of the invention will be apparent to those of skill in the art from the following disclosure and description of exemplary embodiments (Table 1).

Oat bran is a dietary fibre and beta - glucan enriched oat fraction that can be used in products aiming towards improved nutritional status. Oat bran is usually separated from endosperm components by sieving or classification processes [7]. Traditional oat bran products have beta - glucan content around 8 to 12%, whereas oat bran concentrates can have remarkably higher beta - glucan content (Table 2).

Health and nutrition benefits of eating oats

- Eating oats regularly helps to keep the blood cholesterol level low.

Nutrients	Whole grain oat flour	Oat bran
Protein	15 - 17 %	15 - 18 %
Starch and Sugars	59 - 70 %	10 - 50 %
Total Dietary Fibre	5 - 13 %	10 - 40 %
B - Glucan	2 - 6 %	5 - 20 %
Fat	4 - 9 %	5 - 10 %

Table 1: The typical composition of whole grain oat flour and oat bran is presented in the table.

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Fibre contents (%)	Oat Endosperm flour	Whole grain products	Conventional oat bran products	Oat bran concentrates	Beta-glucan isolates
Dietary fiber (%)	5 - 10	10 - 12	15 - 20	20 - 35	80 - 100
Beta - glucan (%)	1 - 3	4 - 5	8 - 12	15 - 22	Up to 80

Table 2: Percentages of Fiber and Beta-glucan content in oats, oats products.

- Oat has also been proven to act as an anti - depressant. It will make you feel calm and will treat depression as well [1].
- Cooked oats relieve fat from the body while unrefined oatmeal can reduce stress.
- Oats also prevent bowel cancer because of its high fibre content.
- Having oats can cure constipation.
- Oats also help in lowering chances of heart-disease.
- Apart from being a good source of protein, oats also provide vitamin E, zinc, copper, iron, etc. [3].

Materials and Methods

Collection of raw materials

The research work "Preparation of Laminated Baked Product using Oats" was carried out at School of Food Sciences and Technology, Karunya University, Coimbatore.

Oats: Good quality of oats were bought from the local market in an around Coimbatore District, Tamil Nadu.

Water: Drinking water from water doctor was taken.

Salt (NaCl): The refined iodized salt was purchased from the local market.

Dalda: Good quality of shortening (Dalda) was bought from the local market in an around Coimbatore District, Tamil Nadu.

Glass wares and experimental set ups

The glass wares and the experimental set ups were used from the R & D and Analysis Laboratory at School of Food Sciences and Technology, Karunya University. Both laboratories are sponsored by Ministry of Food Processing (Govt. of India).

Method

Cleaning of Oats: The small stones and the field impurities were removed in order to get the clean Oats.

Recipe for the preparation of Laminated baked Oats product:

1. Sieve the flour (maida).
2. Mix all ingredients maida, salt, dalda and oats.
3. Make dough in vertical planetary mixer for half an hour.
4. Make sheets of dough by adding dalda and shortening,

Two sheets with shortening and two sheets without shortening

5. Keep the sheets for proffing.
6. Again sheets as per required shape/desired shape.
7. Baking is carried out for 20 - 25 minutes at an oven temperature
 - I. Up temperature - 250°C
 - II. Down temperature - 150°C
8. Allow it to cool
9. Pack it and store at a cool and dry place.

Chemical or proximate analysis

The following parameters were analyzed in the prepared double baked oat product:

Ash content: Ash content was determined as per AOAC [8] method.

Procedure: Two grams of dried sample was taken in a weighed silica crucible. The crucible is placed on a burner and heated till the material is completely charred (smokeless). Then it was placed in the muffle furnace and heated up to 550°C to 770°C for 4 hours. The crucible is transferred to a desiccator for equilibrium with ambient conditions and the weight of the crucible was later recorded.

Ash content was determined using following formula:

$$\%ash = \left(\frac{\text{weight of crucible with ash} - \text{weight of the empty crucible}}{\text{weight of the sample}} \right) \times 100$$

Moisture content: Moisture content was determined as per AOAC [8] method.

Procedure:

1. Clean and dry empty petri-dish was taken and weighed.
2. 10 gm of sample was taken in petri-dish and weighed.
3. Petri dish having sample was kept in oven for drying at 105°C for 4 - 5 hrs.
4. The petridish was taken out from oven and kept in desiccator for equilibrium with ambient conditions.
5. After cooling, the final weight was taken.
6. Steps 3 to 5 were continued till two consecutive constant weights were obtained.

Moisture content is expressed as a percentage of moisture based on wet weight (wet basis) or dry matter (dry basis). Wet basis moisture content is generally used. Dry basis is used primarily in research.

$$Mw (\text{wet basis}) = \frac{w-d}{w} \times (100)$$

$$Md (\text{dry basis}) = \frac{w-d}{d} \times (100)$$

w = wet weight

d = dry weight

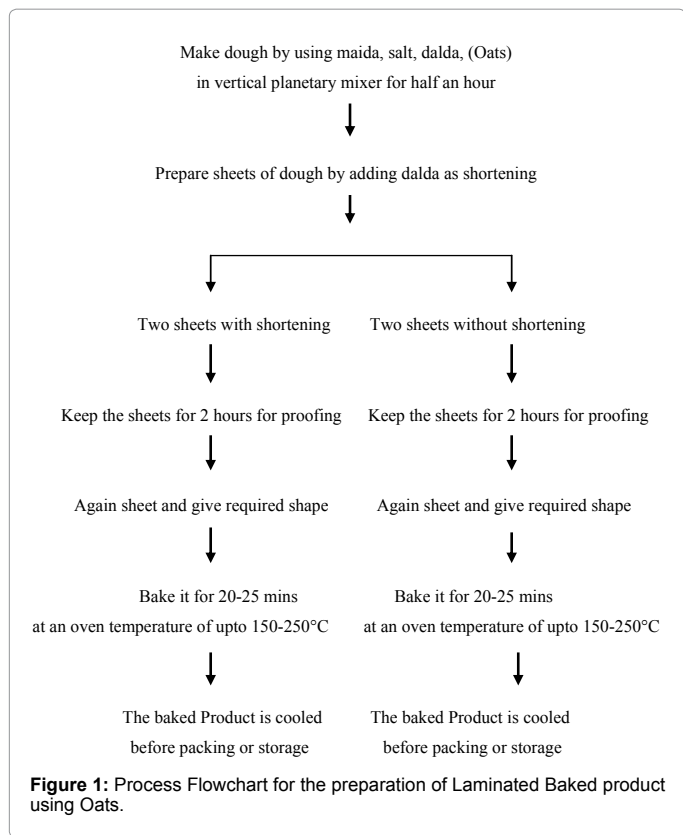
M = moisture content on a percent basis

A representative sample must be obtained to provide a useful moisture content evaluation. Also, the moisture content of the product must be maintained from the time the sample is obtained until the determination is made by storing in a sealed container.

Sensory evaluation: The baked product samples were evaluated for colour, taste, appearance, texture, flavor and general acceptability rating by a panel of 10 randomly selected men and women of between 18-60 years of age, who are familiar with testing laminated baked product. Each assessor was presented with laminated baked product using oats and without oats to taste the samples and rate their impression on a 9-point hedonic scale from excellent-9 to extremely bad-1 (Figure 1).

Results and Discussions

The prepared laminated baked product using oats was assessed for its physico - chemical and sensory qualities. Results recorded during the investigation are presented under suitable headings. The results are also discussed in the view of relevant scientific literature available in the country and elsewhere (Table 3).



Moisture content (WB) of laminated baked product using oats

Moisture content (WB) of the laminated baked product control sample was determined as shown in table below as 18.9 %. This was observed to be in range. Moisture content (WB) of the laminated baked product using oats sample was determined as shown in table below as 16 %. The moisture content of wet basis is more than critical limit or above the range will affect the storage life of the laminated product. The moisture content also affects the water absorption capacity of the flour while preparing laminated baked product using oats.

Moisture content (DB) of laminated baked product using oats

Moisture content (DB) of the laminated baked product control sample was determined as shown in table below as 23.42%. This was observed to be in range. Moisture content (DB) of the laminated baked product using oats sample was determined as shown in table below as 22%.

Ash content of laminated baked product using oats

Ash content of the laminated baked product control sample was determined as shown in table below as 1.008%. This was observed to be in range. Ash content of the laminated baked product using oats sample was determined as shown in table below as 1.002%.

Sensory analysis results

Sensory analysis report-laminated baked product using Oats: The laminated baked product prepared with oats was tested by the panel members who are familiar with testing laminated baked product. The scores were obtained are as below in table. The laminated baked product got overall acceptability as like very much. Most of the people

gave low score to the color and appearance that was slightly brownish color and little crispiness to them (Table 4, Figure 2).

Sensory analysis report-laminated baked product without using Oats: The laminated baked product prepared without using oats was tested by the panel members who are familiar with testing laminated baked product. The scores were obtained are as below in table. The laminated baked product without using oats got overall acceptability as like moderately. Most of the people gave low score to the flavor and taste that was brownish color and taste is little different comparing to with oats product to them (Table 5).

Cost economy

The cost of the production of laminated baked product (without using oats) for the control sample of 1.5kg is Rs. 73. Whereas for the laminated baked product using oats for 1.5 kg is Rs. 80 is estimated (Table 6).

Conclusion

The procedure for the preparation of double baked oats product was standardized. The dependent variable or response measured for



Figure 2: Sensory analysis report-Laminated Baked Product using Oats.

Samples	Moisture Content (WB) %	Moisture Content (DB) %
Control	18.9	23.42
Sample with oats	16	22

Table 3: Moisture content of the laminated baked product.

Sl. No	Product Characteristics	Sample 1 (Control)
1.	Color and appearance	8
2.	Texture	8.1
3.	Flavor	7.3
4.	Taste	7.8
5.	Overall acceptability	7

Table 4: Sensory analysis report-Laminated Baked Product using Oats.

Sl. No	Product Characteristics	Sample 2 (Sample)
1.	Color and appearance	7
2.	Texture	7.8
3.	Flavor	7.5
4.	Taste	8
5.	Overall acceptability	8

Table 5: Sensory analysis report-Laminated Baked Product without using Oats.

Sample	Cost (Rs.)
Control (Without Oats)	73
Sample (With Oats)	80

Table 6: Cost economy of laminated baked product using oats.

each treatment was a sensory score for overall quality, which is taken as a combination of the sensory impact of color, appearance, texture, mouth feel, taste and aroma, the optimum score for overall quality attained for the baked product 7.0 whereas for the baked product prepared with oats a maximum overall quality score 8.0 was obtained.

Oat products are used as ingredients in a wide variety of bread and baked products. These ingredients provide unique flavor and moisture retention characteristics, as well as enhancing the nutritional benefits of these products. It has been demonstrated that oat flour stabilized the fat component in baked products. Development of oat products that serve as a side dish or main dish for other eating occasions could dramatically expand oat usage and the opportunities for consumers to increase their consumption of "oat soluble fibre".

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