

DEVELOPMENT OF VALUE ADDED BREAD USING OATS

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ABSTRACT

Oat and oat based product as a part of a various disease management which includes cardiovascular disease, cancer, hypertension and regulation of blood glucose level etc., may contributes healthy living. The experiment was carried out to develop a value added bread using oats. The bread was formulated by using selected raw materials. Development of variation by altering the percentage of the major ingredients was done. The oat bread was incorporated with wheat germ powder and whole wheat flour to add value to the oat bread. The oat bread was standardized by using sensory evaluation. Nutrient analysis was carried out to the selected oat bread and it was compared with computed nutritive value of oats bread. The evaluated oat bread was kept for shelf life by using various packaging materials like sterilized glass bottle, container coated with aluminium foil, polypropylene cover and plastic container in both room and refrigeration temperature. Microbial analysis was done to determine the number of microorganisms present in food products and to determine the presence of yeast and mold in the selected food products. The developed oat bread was good in its acceptability and improved fibre content. The rate of shelf life was high with the sample which stored in a container coated with aluminium foil.

Keywords: Formulation – Development – Standardization – Nutrient Analysis – Shelf Life – Microbial Analysis

Introduction

Oats, known scientifically as *Avena sativa* which is a rich source of magnesium and a mineral that acts as a co factor for more than 300 enzymes. Food made from the oats contains all the essential parts and naturally occurring nutrients of the entire grain seed (Martin, 2016). Oats approximately contain 55% soluble and 45% insoluble fibres, these fibres reduce the risk of heart disease and control blood sugar level. It also has the potential to reduce the threat of cancer, diabetes, constipation etc; oats contain phytochemicals which has fighting properties against cancer, especially hormone related cancers like breast cancer and ovarian cancer (www.healthmad.com/nutrition/oats-an-extrodinary-diet-food-and-its-importance).

There are two kinds of oats regular and steel cut. Old fashioned oats have fine, soft texture and become a mushy consistency when cooked in water. Steel cut oats have a course and thick texture. They have chewer texture when cooked in water. The reason for this is that steel cut oats are minimally processed, so the grain is left intact. Steel cut oats are whole grain, as they contain the bran, germ and endosperm (Tabak, 2016).

Wheat germ is also a healthy food. The wheat germ contains a good source of folic acid which is essential for the body functions (www.yukozimo.com). Wheat is by far the most important crop for bread making because of its supreme baking performance in comparison with all other cereals (Ellison and Larsson, 2017) Bread is one of the important sources of carbohydrate, in the form of starch in the human diet (Papadopoulos, 2017). Bread and biscuit are the major part of the bakery industry and covers around 80% of the total bakery products in India (www.spectrumcommodities.com/education/commodity/o). This paper deals with developing value added bread using oats; analyzing the nutrient content and shelf life of the value added bread.

Methodology

The major ingredients selected for the formulation of value added bread are oats powder, refined whole flour, whole wheat flour, wheat germ powder, soy powder. The items were formulated by using the basic ingredients. Total of fifteen variations were developed by altering the percentage of major ingredients. The product was then standardized with the help of sensory evaluation. The Computed nutritive value of value added bread was calculated. The standardized bread was estimated for various nutrients like carbohydrates, protein, fat and fibre by using Anthrone method, Macrokjeldhal method, volumetric Gerber's method and AOAC method. The selected value added bread was kept for shelf life analysis in various packaging materials like sterilized bottle, a container coated with aluminium foil, polypropylene cover and plastic container in both room and refrigeration temperature. Microbial analysis was done to determine the number of microorganisms present in food products and to determine the presence of yeast and mold in the

selected food products. Direct plating method was carried out. The best product in all the aspects was selected and addressed.

RESULTS AND DISCUSSION

Table - I
PERCENTAGE OF INCORPORATION OF OATS IN BREAD

Ingredients	Variation (G)														
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV
Oats powder	4.7	9.5	14.2	19	23.8	28.5	33.3	9.5	23.8	28.5	23.8	23.8	19	23.8	23.8
Refined wheat flour	28.5	23.8	19	14.2	9.5	14.2	-	28.5	19	28.5	19	14.2	19	19	9.5
Whole wheat flour	4.7	4.7	4.7	4.7	4.7	4.7	4.7	9.5	9.5	-	4.7	-	-	-	-
Wheat germ powder	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	-	-	-	9.5	4.7	4.7	-
Soy powder	4.7	4.7	4.7	4.7	4.7	4.7	4.7	-	-	-	-	-	4.7	4.7	4.7
Sugar	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Yeast	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Milk powder	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Water	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
Fat	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
Salt	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

Table - I reveals the percentage of incorporation of oats in value added bread.

Table - II

Comparison of Computed and Analyzed Nutritive Value of Selected Value Added Oats Bread

Nutrients (g)	*Computed Nutritive Value/ 1 Slice	Analyzed Nutritive Value/ 1 Slice
Energy (k.cal)	73	74
Protein	2.27	2.11
Fat	1.19	1.34
Carbohydrate	13.1	13.26
Fibre	1.1	3.8

*mobile.fatsecret.com

From the table it was evident that the value added bread was less in its nutrients like energy protein, carbohydrates, but fibre and fat content has increased. Carbohydrates have special significance in cereals which usually comprise about 50 percent to 80 percent carbohydrate on a dry weight basis (Shelton and lee, 2018). Baking process step may lower the anti oxidative activity but techniques such as encapsulation of antioxidants can retain their activity (kirby, 2018).

Table - III

MICROBIAL LOAD OF OATS BREAD AT ROOM TEMPERATURE

Sample Identification	Yeast And Mold (10cfu/Gm)		
	First day	Second day	Third day
Bread sample kept in glass bottle	24	28	31
Bread sample kept in plastic container	11	15	18
Bread sample kept in polythene cover	9	12	17
Bread sample kept in aluminium foil	6	9	11

The table – III shows the microbial content of yeast and mould for packed foods. The microbial load should be absent and the normal microbial content of yeast and mould for unpacked foods should be 5×10^6 cfu/g. The normal analyzed products were quite higher from the first day to third day after the product was developed.

Conclusion

From the present study it may be concluded that developed value added bread using oats can be implemented in bakery industry to enhance the fibre content of the bread; to make use of the beneficial effects of oats in a better way; and to give a new view to the customers.

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