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A STUDY OF A MULTIGRAIN GLUTEN FREE AND PROTEIN RICH FLOUR – MEAL TO HEAL

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ABSTRACT

A study was conducted to understand the acceptance of blended healthy gluten free high protein flour; our aim was to standardize an innovative, preservative free, simple, nutritional blend that is cost effective. The product designed was multigrain flour, having a unique blend of chick pea, oats, soya, Indian chia- sabja and fenugreek. This makes the product gluten free, protein rich having high fiber content with good amounts of antioxidants. The acceptance was studied by conducting a sensory evaluation using the scoring method based on a five point scale. The Evaluation was performed on sensory attributes like Appearance, color, taste, texture, aroma, and overall acceptability of the product. Microbial analysis was carried out for validation of its shelf life. Our other vital focus was on packaging, nutritional labeling, budgeting and marketing.

Keywords: multi-grain flour, gluten free, sensory evaluation, neurological disease, obesity, celiac disease, healing, diabetes, functional foods, heart disease, high protein.

INTRODUCTION

In today's urban world people face many problems, one of which is the massive health degradation due to multiple reasons such as stress, faulty lifestyle and improper eating habits; other than these, metabolic syndromes and inborn errors have been observed in a number of individuals. Today the number of children suffering from allergies is high a study published by the journal of pediatrics stated that about 8 percent of children suffer from one or more food allergies (www.edb.utexas.edu).

Multigrain high protein gluten rich flour which we like to call as 'Meal to heal' is specially developed for the urban and health conscious individual. Gluten has an impact on health when taken in excess. Excess gluten also has an impact on the functioning of our brain (www.huffingtonpost.com). The lancet journal published a study which claimed that gluten sensitivity can be a neurological disease. Its consumption is also associated with Schizophrenia, Autism and Epilepsy (www.maplevalleyreporter.com).

Over the years there has been a significant increase in our gluten intake due to the amount of processing that food undergoes. This has been termed as the "gluten overload". It has been observed that a diet with reduced amounts of gluten would even be therapeutic for treatment of autism (www.maplevalleyreporter.com) although we believe all foods are important and essential, their proportions and quantity affects their quality of healing. As a substitute to reduce ones excess gluten

intake, our meal to heal can prove very positively influential in ones daily dietary pattern (www.ncbi.nlm.nih.gov).

Meal to heal can prove to be a boon for the patients of digestive disorders such as celiac disease. The combination of grain makes it an excellent choice for weight watchers, diabetics, vegans and health aspirants, as it contains antioxidants and is a diabetic functional food due to its soluble fibre content also acting as a preventive food for cardiovascular diseases (www.ncbi.nlm.nih.gov) and cancer, a study published in 2005 states that "Dietary flaxseed has the potential to reduce tumor growth in patients with breast cancer" (www.ncbi.nlm.nih.gov). Indian chia sabja has been found to have anticarcinogen properties (www.ncbi.nlm.nih.gov) and are considered to be exceptionally healthy antioxidants (www.ncbi.nlm.nih.gov) also its rich fibre content and good biological value of protein truly makes for a meal with promising healing effect.

"Managing GFD in India is difficult; there is little knowledge of how patients cope with their dietary needs, there is a need for trained dieticians" (www.therapy.epnet.com) there is also a need for products that help dieticians and simplify the complication of coping with such allergies or diseases that require restriction of gluten in ones diet. Avoiding gluten will no longer mean giving up foods such as bread, muffins, tarts, pasta or the traditional Chapatti & bhakri.

The meal to heal flour is able to create various recipes by itself. Thousands of people have to follow a

gluten free diet due to celiac disease and now they have an option of relishing all the recipes of their choice using a modified flour and avoiding the troubles of self mixing of different flours.



OBJECTIVES

- To standardized gluten free flour.
- To understand all aspects of entrepreneurship.
- To study the acceptability of the product using sensory evaluation.
- To design a creative nutrition label.
- To make a cost effective product.
- To find suitable packaging material.
- To market the product with industries, nutritionist and health conscious individuals

MATERIALS, METHOD & STANDARDIZATION OF THE RECIPE

The aim of our product is to supply a low cost and health efficient flour that can replace the refined flour intake in our diets. The flour is designed for the convenience of today’s urban individual for who health is a priority but it has to be hassle free. Supplying a ready preservative free package is the only way to urge people towards a simple hassle free quick and health promoting alternative.

The consumer acceptance, palatability, utility and nourishment provided by the product with its healing properties were our major focus. The Mix of flours included oats, soya, chick peas, Indian chia – sabja and fenugreek powder. The unique mix made the product Rich in protein, abundant in healing properties as it contained antioxidants, functional foods was low in calories, gluten free and contained good amounts of fibre. The range of food products it made without any added ingredients was suppressing and therefore the perfection of “Meal to heal” was standardized.

Table No. 1: Raw ingredients

Ingredients	Amount(gm)
Oats	30 gms
Soya	25gms
India Chia- sabja	15gm
Fenugreek	5 gm
Chickpea	30gms

METHOD OF PREPARATION

Grind the products in a mixer or food processor
(Oats, Sabja & fenugreek seeds)

Mix the powdered flours together

Mix thoroughly and do not sieve as it would reduce the fibre content

Package in BPA Free plastic bags if available, an alternative for plastic would be preferred but due to coast effectiveness and the need to provide to the masses we chose the least hazardous plastic that availed in our budget.

Make 100 gm packets and seal, Air tight.

Stick nutrition label & price tag

Nutritional Information for 100Gms of flour

Table No. 2: Nutrient analysis

Nutrients	Amount
Energy	393kcal
Protein	27gm
Carbohydrate	46gm
Fat (unsaturated)	7gm
Fibre	13gm
Calcium	193mg
Iron	7mg

MAJOR INGREDIENTS OF FOOD PRODUCT

SOYA

It is referred as meat of the field as it is a plant based product and is a protein rich food. “The average biological value of soybean protein for maintenance for that in cooked soy flour is 91.7%” as stated by the researchers at the Department of Physiological Chemistry, Wayne University College of Medicine, Detroit, Michigan. “College of Medicine at the University of Kentucky recently analyzed results from 43 previously published studies involving on soy protein and risk of Coronary Heart Disease (CHD). What they found was an overall decreased risk of CHD when approximately 30 grams of soy protein was consumed on a daily basis.”

Thus it can be suggested that soya in moderation is safe for consumption and has many healthy benefits.

CHICKPEA

Garbanzo beans called as chickpeas are rich in soluble and insoluble fibre also folic acid and protein. It has been processed into flour for its use in Meal to Heal. It is a rich source of B vitamins’ and minerals such as potassium and phosphorous. Their production requires less nitrogen fertilizer and therefore contributes to reducing the risk of cancer.

OATS

They contain beta glucan which has many therapeutic benefits, it improves blood pressure levels. Reduces cholesterol, improves HDL i.e.: good cholesterol, has low glycemic index, It improves immune function, contains abundance of fibre. “Various beta-glucan products have been advocated for the treatment of conditions as diverse as allergic rhinitis, cancer, infections, and sepsis. Oats also prevent against post menopausal breast cancer and reduce risk of type 2 diabetes.

MATERIAL

PACKAGING MATERIAL: POLYPROPYLENE

It is a very acceptable packaging material. It is resistant to sunlight, air, humidity therefore prevents degradation of the product that it is used to preserve. During its processing, vitamin E is added which further prevents degradation. Our ideal choice of packaging would be BPA free but due to the need for affordable cost effectiveness we settled for the above mentioned packaging.



BUDGETING

Budgeting is a critical factor to attain economic success. It makes it easier for people with incomes and expenses of all sizes to make conscious decisions about the allocation of all sizes of money. For the Bulk Production, food ingredients and packaging material were bought from the wholesale markets to reduce the expenses and increase the Profit. Our aim was to create a healing product and bisphenol free plastic was vital for that but its high market price made it unavailable and would mean that the product won't be for the masses as it would be expensive therefore the decision to consult our means was taken rather than our wishes, to manufacture a ultimate health alternative.

Table No. 3: Budget

Ingredients	Wholesale Price (Rs.)
Oats	115
Sabja	60
Chick pea	53
Fenugreek	30
Soya	60
Packaging material	10

Label Printout	20
Electricity	30
Labor	25
Total	403

Total 25 packets were made out of which 20 packets were sold & remaining 5 were kept for sensory evaluation & microbiology test of Meal to Heal Flour. Total cost for production of the flour was Rs.403 /-, per packet price was Rs.25/-. After selling the product total gain was Rs.500- out of which profit was Rs.97 /-. As the ingredients were purchased at wholesale rates profit was slightly more.

NUTRITIONAL LABELING

Nutritional Labeling is a vital process in the food processing chain and label bridges the gap between a consumer and the producer. It helps the purchaser identify the difference between similar products and make an appropriate choice as per their requirement. Apart from being informative and having clarity it is to be made attractive so that it also acts as a tool for marketing.

Meal to HEAL FLOUR

"High Fibre, Protein Rich, Gluten Free & kissed with Antioxidants"

Ingredients:
Soya, Indian chia - Sabja, Oats, Chick pea, fenugreek

No added preservatives

Nutritional Information
Energy : 393 kcal
Protein: 27gm
Fibre: 13 gm
calcium: 193mg
Iron : 7mg

Net wt. : 100 gm
Mfd: 17th February 2014
Best Before : 3 months of Mfd
Price - 25/- Rs

GLUTEN
FREE

DAIRY
FREE

WHEAT
FREE

V
V

Manufacturer & Distributors:
Divinity Malshe & Drashti Velani
9920325631 / 9819197551

★ It also can be recommended for weight loss, diabetes, cardiovascular disease & celiac disease

It consists of ingredients, Nutritional Information, Net Weight, Manufacturing date, Expiry Date, Manufacturers & special recommendations.

RESULTS AND DISCUSSION

From the below 4 Figures it can be observed that color improved through the weeks, the improvement of various sensory attributes is greatly affected by the food product made from the flour. Overall the product remained good and was accepted and even had a further demand. The last sensory evaluation was conducted on a trained panel of nutrition experts and mothers, it was observed that they considered the innovation of Meal to Heal flour to be a boon as it could improve the nourishment of their

children without restrictions as the flour was capable of making products such as pasta and muffins.

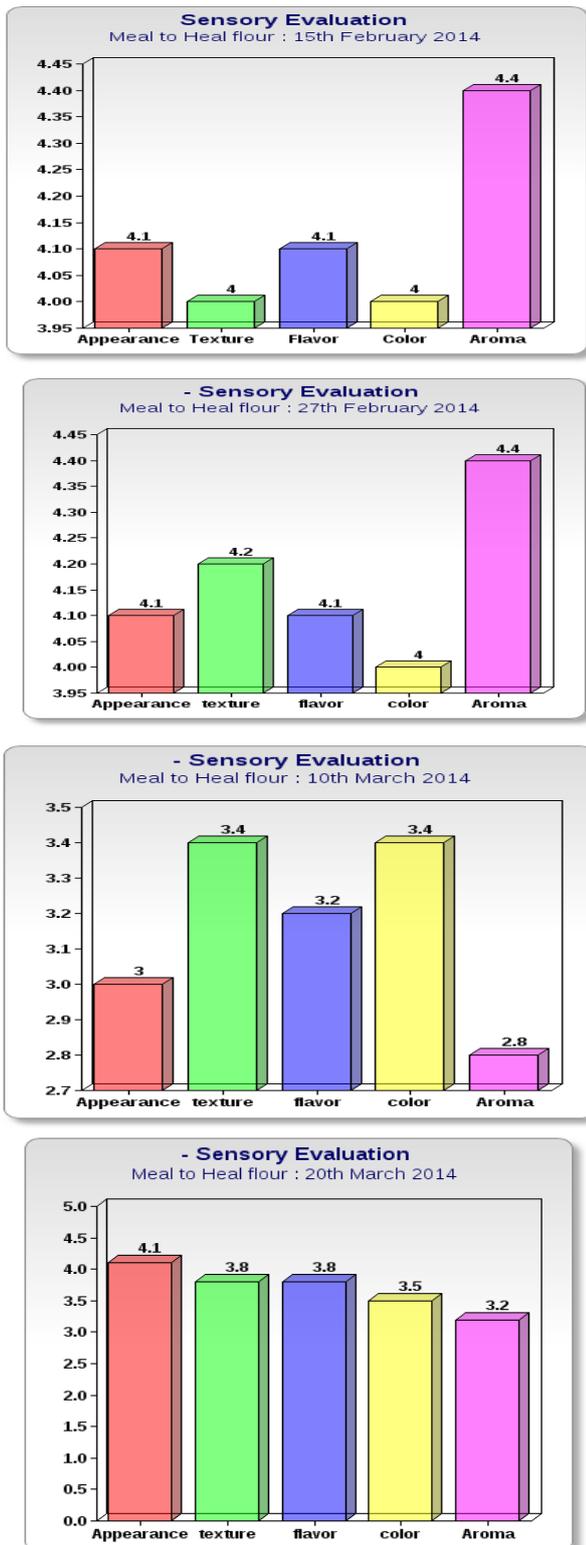


Figure 1 - Sensory Evaluation of Meal to Heal flour for 4 weeks after Bulk production with the assistance of Scoring Test using a 5 point scale, where - 5 = Excellent, 4 = Very good, 3 = Good, 2 = Fair, 1= Poor.

SENSORY EVALUATION FOR STANDARDIZED RECIPE

Shelf life study was observed that texture and aroma of multiple products made from the flour scored exceptionally and Appearance and flavor scored very well. The product was accepted by all and was therefore finalized to continue the shelf life study. Scoring test was done with the help of trained panelists. Attributes to be considered were Color, Texture, Taste and Aroma which were scored on a 5 point scale, where - 5 = Excellent, 4 = Very good, 3 = Good, 2 = Fair, 1= Poor (Figure 1).

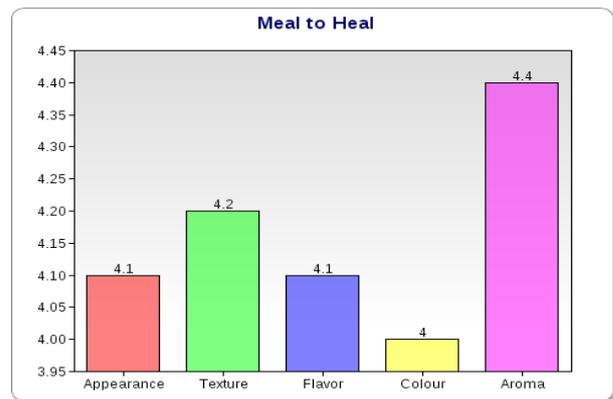


Figure 2 - Sensory Evaluation of Meal to Heal: - 15th February 2014

MICROBIAL TESTING FOR SHELF LIFE STUDY

The shelf life of a product can be defined as the time phase in which the product is safe and has acceptable qualities to be purchased and consumed. Microbial testing was done to determine the shelf life of Multigrain gluten free flour “Meal to Heal” as food products undergo many changes over their lifespan. Microbial testing was done in the sixth week. Pour Plating method was used for microbial testing. “The Meal to Heal” flour was diluted twice & mixed with liquefied Nutrient Agar in such a way that the colonies formed on the plates are countable/ not countable (Table 4).

Table 4: Microbial testing for shelf life study

Dilution	No. of Colonies
10 ⁻¹	2-3
10 ⁻²	1-2

Table No. 4: It was found that the numbers of colonies formed were in acceptable range & thus the product was safe for consumption. Therefore the flour is safe for consumption for up to 2 months.

Tips for improving shelf life

- Store packaged flour in a cool dry place.
- If seal opened then store in a dry glass or air tight container
- Prevent any degradation by keeping the flour away from moist places to avert it from absorbing moisture

CONCLUSION

“Meal to heal” is an innovative health alternative and a boon to patients suffering from various ailments and disease such as Celia disease, cardiovascular diseases, obesity and overweight, gluten allergy, dairy allergy, diabetes and blood pressure. It is not only healing but also preventive. It has a long shelf life and is safe for consumption and preservative free. Also its healing ability could be improved by packaging it in BPA free material.

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