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RESEARCH ARTICLE

A STUDY TO DEVELOP A MALTED BEVERAGE FOR YOUNG ADULTS (AGED 18-35 YEARS)

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Abstract

Malted beverages are non-alcoholic in nature and are ideal sources of energy for mental and physical activity as they are rich in carbohydrate. They can also alleviate stress due to the high-quality proteins. As compared to sweet and high-calorie energy drinks, they are healthier alternatives.

Objective: This study aimed to conduct a Market survey along with KAP (Knowledge Attitude and Practice) survey among the young adults to understand the needsof malted beverage. Depending on the survey result the study also aimed to develop a gluten-free, nutri-dense malt based beverage and to evaluate the nutritional and sensory parameters of the developed product.

Methodology: The study was designed to create malted beverage. Malted barley flour was substituted with malted quinoa and ragi flours, the product underwent sensory evaluation in multiple variations and the most preferred variation was further subjected to nutritional analysis to enumerate its nutritional enhancement.

Result: Theresults showedthattherewasanincreaseinthenutritionalcontentofthebeverageafterincorporation of malted quinoa and ragi as compared to the basic variation which contained only malted barley.

Conclusion: The study concluded that malted beverage is packed with nutrients and also convenient to consume. The protein, calcium and iron rich properties of quinoa and ragi make the developed product ideal for the young adultpopulation.

Introduction:-

Malting is a process by which a cereal is converted into its usable form for brewing leading to certain physical and biochemical change within the grain, which is then stabilized by grain drying1. Malt is also used in the food industry as natural flavoring, breakfast cereals, malted milk drinks and so on. The primary cereal used in the production of malt worldwide is barley but wheat and sorghum can also be used to produce malt[1,2].

Innovative foods and beverages meet the nutritional needs of individuals suffering from metabolic disorders like obesity, hypertension, diabetes and dyslipidemia. People are also suffering from celiac disease that is the gluten sensitivity especially for them the gluten free products are developed[3]. In research it was showed that gluten free malted quinoa beverages haveaniti-diabetic and antihypertensive potential and hence can be included effectively among the diet choices for the management of diabetes and hypertension[4].

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In quinoa, the main carbohydrate content is starch which constitutes from 52% to 69% of the grain. The total dietary fibre is 7% to 9%. A quinoa based beverage which contained dairy was created as a ready to drink product5. It is a high energy, wholesome and thirst quenching drink whose calorie content is reduced due to the addition of artificial sweeteners. This highly nutritive product is suitable for the people belonging to all age groups. It was found that addition of quinoa malt to a beverage helps to make the product more nutritious[6,7].

Today malted milk is a good and attractive option which has potential health benefits and economic considerations. Malted milk foods provide high nutritional value with necessary levels of minerals and vitamins. It also acts as a milk substitute for lactose intolerant people. These foods are of great value due to their easy digestibility, high palatability and conveniences for consumption8.

Objectives:-

The objective of this study is to develop a gluten free nutri-dense malted beverage for young adults aged 18 to 35 years and also to estimate the nutritional contributions of the developed product along with the assessment of the acceptability of the product in the young adult community.

Methodology:-

Product development

The product was developed in three stages:

a. In the first stage, a market survey was done to find out the availability of malted beverages in India and also to check the ingredients used in the malted beverages.
b. In the second stage a self-made KAP questionnaire was created and circulated among the random sample size of 100 respondents reside in Kolkata to assess the knowledge, attitude and practice of consumers towards malted beverages.
c. The final stage included the gluten free nutri-densed product development.

Processing of Raw Materials:

The grains were malted separately. Barley, Ragi and Quinoa grains were washed first to remove all the dirt and small pebbles. They were rinsed 3-4 times until the water was not cloudy anymore. Then the water was strained and the grains were added in a separate vessel. Filtered water was added to the vessel and it was covered with a lid and kept in a cool dark place for 48 hours. The water was changed at the interval of 12 hours. After 48 hours, the water was drained and the grains were spread on a wire mesh and covered with a wet muslin cloth and this was also kept in a cool, dark place. After 48 hours, the grains were sprouted. Then the grains were air dried for 12 hours followed by oven drying at 180 degreecentigrade for 15 minutes. After that the grains were cooled and then ground in the mixer-grinder until a fine powder was obtained. The malted powders were then stored in air-tight containers to use for future experiment.

Basic Recipe: Malted Beverage

Table 1:- Basic Recipe for Malted Beverage.

Ingredients	Amount (g/ml)
Milk	200ml
Honey	10g
Malted Barley Powder	15g
Banana	40g

Method:-

Banana and the malted barley powder were taken in a mixing bowl along with milk and honey. Then all the ingredients were mixed well until a fine consistency.

Variations in Recipe:

Table 2:- Different Variations in Recipe for Malted Beverage.

Ingredients	V1	V2	V3	V4	V5	V6

Milk	200ml	200ml	200ml	200ml	200ml	
Fruit	30g	20g	10g	-	-	-
Honey	10g	10g	10g	10g	10g	10g
Malted Barley Powder	15g	15g	10g	-	-	-
Malted Ragi Powder	15g	20g	25g	30g	20g	15g
Malted Quinoa	-	-	10g	15g	20g	30g
Cocoa Powder	-	-	-	10g	15g	20g

Result and Discussion:-

Market Survey:

Market survey was conducted on malted beverages available in the market in the shopping platforms like amazon, big basket, grofers and spencers. After conducting the survey it was concluded that very few malted drinks are available for adults. Most are available for children. Among all the products mentioned above, none have used quinoa as an ingredient while making the drink. Out of all the products only two are gluten free, the rest contain gluten in the form of wheat. The beverages available are mostly in powder form.

KAP on Malted Beverages:

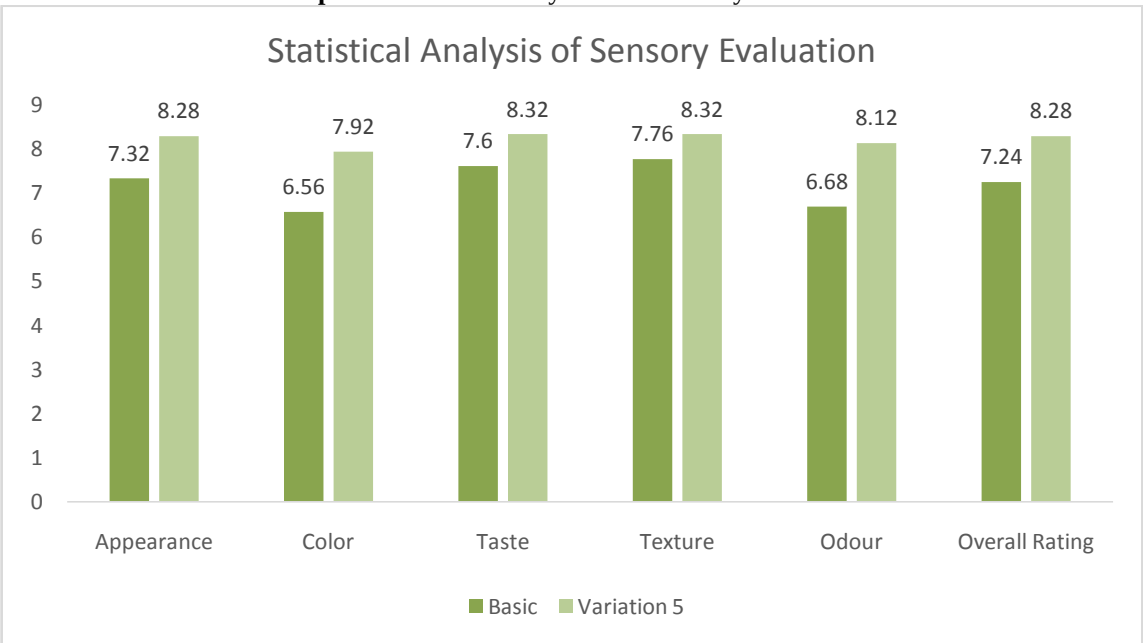
A Knowledge-Attitude-Practice Survey was carried out in order to assess the acceptability as well as the knowledge-attitude-practice of consumers. Based on these responses the beverage was developed. Among the 100 respondents, 61.4% were female and 37.6% were male.

85.1% of the respondent was healthy whereas 13.9% were suffering from several diseases such as PCOD, obesity, diabetes. 61% of people were unaware about malted beverages and 59% agreed to consume malted beverages.

Sensory Evaluation:

A sensory evaluation was done using the 9-point hedonic scale. Different parameters were marked by the 50 untrained panel members. According to the panel members among the five variations V5 secured the highest acceptability.

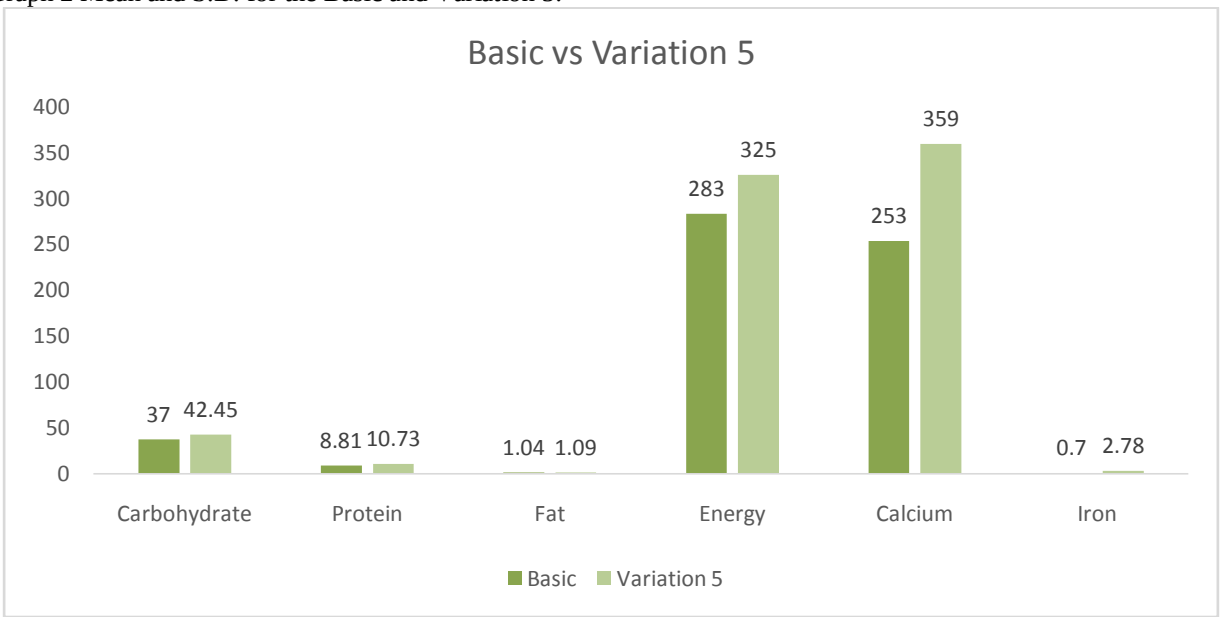
Graph I:- statistical analysis of the sensory evaluation:



Graph I showed the statistical analysis of the sensory evaluation between the basic malted beverage & the variation 5. Scores for appearance of the basic recipe was 7.3 whereas the V5 got a score of 8.3. Again V5 got the highest score of 8 for most appealing color among the other variations. It can be observed that the taste acceptability score of variation 5 was 8.3. It was also reported by the panel members that the taste of the other variations were slightly bitter and also had an after taste as compared to variation 5. Variation 5 received the highest score of 8.3 in terms of texture. The panel members reported that this variation had a smooth texture, no grainy after effect and also resembled the texture of beverages available in the market which made it the most acceptable one. Again variation 5 received the highest score of 8.1 in terms of odour. Therefore Variation 5 received a best feedback with a score of 8.3 as compared to the basic beverage as it resembled an aroma of brewed coffee, even though there was no coffee added to the variation. It was neither too strong nor was it too light.

ICMR Calculations:

Graph 2 Mean and S.D. for the Basic and Variation 5:



The carbohydrate content of the basic malted beverage was 37g whereas the carbohydrate content of V5 was 42g. The increase in carbohydrate content is due to the addition of two grains, quinoa and ragi whereas the basic variation only had barley. The fifth variation of the product has been developed using malted quinoa and malted ragi. Both of these grains are rich in complex carbohydrates with a low glycemic index. Consumption of this beverage can reduce weight by controlling the appetite. Protein content of the basic variation is 8.8g per 100g of the product, whereas the protein content of variation 5 is 10.7g per 100g of the product. This is due to the fact that protein content of quinoa and ragi are higher in comparison to the protein content of barley. A high protein diet aids in boosting metabolism, controlling the appetite, improving blood sugar levels in the body and also helps to temper the insulin response by balancing the levels of glucagon and insulin in the blood. It also helps to maintain the ideal body weight and also helps to increase the muscle mass and strength. The fat content of the basic variation is 1.04g whereas the fat content of V5 is 1.09g, this is due to the addition of two grains quinoa and ragi, each having a fat content of 0.7g and 0.38g per 100g respectively. The basic variation contains barley which has a fat content of 0.9g per 100g. The energy content of the basic variation is 282.53 kcal per 100g of the product where as that of V5 is 324.8kcal per 100g. This is due to the energy content of ragi and quinoa. Despite being high in energy, it would not be harmful to the body as they are complex carbohydrates, they take time to be broken down in the body, and hence the person does not feel hungry very fast and remains energetic to do physical activities such as exercise of any form. This property of quinoa and ragi can help in becoming a pre-workout supplement. The calcium content of the basic variation and V5 which is 253.01mg and 359 mg respectively. V5 has higher calcium content as both quinoa and ragi grains are high in calcium content. A high calcium diet is beneficial for maintaining good bone health. It can also help in managing blood pressure particularly among young people and also helps the muscle to contract, lowers cholesterol level by inhibiting cholesterol and saturated fatty acid absorption. The iron content of the basic variation and V5 are 0.7mg and 2.78 mg respectively. Ragi is a rich source of iron which is beneficial in treating anaemia.

Product Costing:
The cost of the most accepted variation, i.e. variation 5 was Rs.231 for 300 ml of the product.

Conclusion:-

Malted beverages are excellent sources of energy as malt if packed with vitamins, minerals, starch, proteins then body can absorb these nutrients very quickly and even process them. Malted beverages in general are naturally sweet, nutty and have a slightly buttery taste;therefore these are an ideal source of energy for mental and physical activity. Finally, to conclude, malted beverages are the perfect replacers for tea, coffee, carbonated and caffeinated energy drinks and even soft drinks. These are made of complex carbohydrates which help the body to not feel hungry thereby even helping in reducing weight. The protein, calcium and iron rich properties of quinoa and ragi make the value added ideal malted beverage suitable for the young adult population.

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