AMYLASE RICH PORRIDGE EFFECT ON GERIATIC HEALTH

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ABSTRACT

Old age is the most susceptible group which has profound relation with various diseases. The present study was planned to perform it in three parts. Before supplementation questionnaire was filled to know their dietary pattern and BMI was calculated after knowing their height and weight. The amylase rich non-fermented porridge and fermented porridge were developed including ARF powder from which non-fermented porridge was supplemented to the 25 experimental subjects for 30 days the result showed that hemoglobin level increased, minor increase in serum protein level and there was no change observed in blood glucose level. So that product shows the positive effect of amylase rich non-fermented porridge in elderly group.

Keywords: *amylase, fermented, hemoglobin, porridge, total protein*

INTRODUCTION

Malting is the controlled germination followed by controlled drying of the kernels. The main objective of malting is to promote the development of hydrolytic enzymes, which are not present in non-germinated grain (Dewar et al., 1997 and Girawale *et al.,* 2016). Other benefits of the malting process include increased vitamin C content, phosphorus availability, and synthesis of lysine and tryptophan, calcium content (Dulby and Tsai, 1976 and (Sangita and Sarita, 2000). Furthermore, amylases are elaborated and as a result the viscosity of gelled starch decreases (Brandtzaeg et al., 1981). Malting also includes the inhibition of growth of pathogens through the fermentation process. Amylase rich food (ARF) is germinated cereal flour, which is extremely rich in the enzyme alpha-amylase. The alpha-amylase cleaves the long carbohydrate chains in the cereal flour into shorter dextrins. It modifies the starch content of the cereals so that they do not thicken and would therefore not require dilutions resulting in enhanced digestibility (Inyang and Idoko, 2006). This remarkable property makes it possible to offer a low viscosity yet high energy dense preparation. Therefore, a study was conducted to assess the effect of feeding Amylase Rich Malted Mixes (ARMMs) on the nutritional status of vulnerable groups of population, that is, geriatric people.

A person above 60 years considered as senior citizen. Old age is the condition in which degeneration is more than regeneration. This ageing process effect on the physiological, psychological and immunological functions of the body. By the time a person reach the age of 60 to 65 years, his habits are thoroughly deep-rooted in him and this is especially so with his dietary patterns. As a person ages and illnesses set in, it becomes compulsory for the elderly to change their dietary habits. Old age is the vulnerable period of life, difficulty in chewing and swallowing and other health problems results in inadequate food intake. Most common demand is to have soft food because of loss of teeth or swallowing problems. In light of this background, it was considered worthwhile to probe into the condition of such people. The study aimed to assess nutritional health profile of selected elderly group (n=25) of "Anand Dham Old Age Home".

OBJECTIVE

To know the amylase rich porridge effect on geriatic health

METHODOLOGY

The experiment was carried out to assess the effect of ARF on geriatrics. The work was divided into three sections which includes pilot study, product development, and supplementation.

Pilot study was concerned with the effect of ARF on the health profile of geriatrics. The present exploration was

carried out to assess the nutritional status of geriatrics(above 60 years of age) using clinical assessment such as blood analysis. Auxiliary factors such as general information, medical information and dietary information were studied. Nutritional level was also assessed using Anthropometric measurement and open ended questionnaire.

Selection of subjects

The people above the age of 60 years were selected from "ANAND DHAM OLD AGE HOME". Total 25 subjects were selected from that 11 were males and 14 were females. Biochemical parameters including Hemoglobin level, Blood Glucose levels and Serum protein levels were assessed at the beginning and at the end of the feeding trial.

Biochemical assessment of Elderly

The objective of this study was to assess the hemoglobin status or seum protein status of the elderly people. Hemoglobin (by sahli's acid hematin method, serum total protein (using liquid gold kit) and blood glucose (using a kit of in vitro God/Pod Method) levels were estimated at the beginning and at the end of the feeding trial as an indicator of body iron and protein status.

Product Development

The second part of the study deals with the development of product with the objective of increasing the available iron and protein in the daily diet of the selected elderly subjects. Recipes of porridge was initially selected and from that experimental product was developed using various ingredients. The experimental product was nutritionally analyzed.

Sensory evaluation of experimental product

Third phase of study included the systematic sensory evaluation of standard product. The systematic sensory evaluation was carried out on different standard experimental products compared each with control product by a panal of judges. The Composite scoring test was conducted.

Analysis of data

The mean score and SD of obtained score were calculated. The data was subjected to any way analysis of variance i.e T-test analysis.After obtaining the score for each experimental product by means of sensory evaluation tests the product obtained maximum score was considered as the final experimental product.

Nutritional analysis of fermented and non fermented porridge

The developed fermented and non fermented porridge was analyzed for fat (Soxhlet method), ash (AOAC, 1990), calcium (Clark and Collip, 1925), phosphorus (Fiske and Subbarao, 1925), iron (Ramsay, 1954), protein (Kjeldhal method) and vitamin C (Johnson B.C 1948) content.

Supplementation

25 elderly people were selected as an experimental subject. They were requested to follow the general pattern of diet without much variation during the experimental feeding period. Each subject was then fed 150ml of porridge (which would be consumed one serving during breakfast) at the day time for 30 days (even during holidays). Hemoglobin, serum protein and blood glucose level were estimated at the beginning and at the end of the feeding trial.

RESULTS AND DISCUSSION

In the pilot study the subjects for experiment were selected and their height and weight was measured then BMI was calculated. Both the gender i.e male and female were involved in an experimental group. Male subjects had higher BMI compared to female subjects before supplementation. The ratio of underweight was higher in females compared to males. The hemoglobin level assessed was higher in again male than female group. Total protein was slightly lower than the normal range. The blood glucose level was higher in female subjects compared to male subjects before supplementation.(Table 1)

Table 1: BMI, hemoglobin, total protein and blood glucose content of male and female subjects

Sr. No.	Parameter	Before supplementation of non-fermented porridge		After supplementation of non-fermented porridge	
		Male	Female	Male	Female
1	BMI	20.39 ±1.307	19.094 ±0.857	20.552 ±1.303	19.324 ±0.826
2	Hemoglobin	10.273 ±0.412	8.000^{b**} ±0.262	11.636 ±0.448	9.214^{b**} ±0.266
3	Total protein	5.245 ±0.358	5.132 ±0.316	6.119 ±0.366	5.901 ±0.332
4	Blood glucose	107.869 ±6.861	108.385 ±6.743	106.524 ±6.781	104.202 ±6.467

Mean of n ± SEM

Values sharing a common subscript within a raw are not significantly different.

*p<0.05 = significant difference, **p<0.01 = highly significance difference

In the second part of study the non-fermented and fermented ARF porridge was prepared and then nutritionally and sensory evaluated. The non fermented ARF porriedge was nutritionally better then the fermented porridge. The non-fermented ARF porridge was selected for the supplementation because it contained calcium content in higher amount compared to fermented porridge and it had higher sensory score for the sensory quality compared to fermented ARF porridge.(Table 2 and 3)

Table 2: Ash, fat, calcium, phosphorus, iron, protein and Vitamin C content of experimental product

No.	Parameter	Non- Fermented	Fermented
1	Ash (gm%)	3.818 ±1.616	1.743 ±0.590
2	Fat (gm%)	0.578 ±0.032	0.312 ±0.168
3	Calcium (mg%)	19.348^{**} ±2.419	5.417 ±0.121
4	Phosphorus (mg%)	61.759 ±0.516	68.375^{**} ±0.377
5	Iron (mg%)	25.161** ±0.065	20.556 ±1.128
6	Protein (gm%)	3.331 ±0.125	4.194 ±0.536
7	Vitamin C (mg%)	11.111 ±1.814	13.333 ±2.560

Mean of n ± SEM

Values sharing a common subscript within a raw are not significantly different.

*p<0.05 = significant difference,

**p<0.01 = highly significance difference,

Table 3 : Sensory quality of control and experimental porridge

Sr. No	Sensory quality	Control porridge	Experimental porridge	
			Non Fermented	Fermented
1	**Color**	7.060 ±0.136	7.533 ±0.165	6.066^{**} ±0.228
2	**Consistency**	7.867 ±0.236	7.400^{*} ±0.126	7.133^{**} ±0.192
3	**Texture**	7.400 ±0.163	7.333 ±0.159	6.733^{**} ±0.153
4	**Taste**	17.733 ±0.345	17.400 ±0.0.254	14.800^{**} ±0.355
5	**Flavor**	7.866 ±0.165	7.400^{*} ±0.131	6.400 ±0.190
6	**Mouth feel**	7.400 ±0.190	7.333 ±0.126	6.000^{**} ±0.195
7	**After taste**	7.800 ±0.243	6.866^{**} ±0.256	5.266^{**} ±0.266
8	**Absence of defects**	7.866 ±0.165	7.733 ±0.266	5.866^{**} ±0.215
9	**Overall acceptability**	8.200 ±0.200	7.600^{**} ±0.190	5.733^{**} ±0.228

Mean of n ± SEM

Values sharing a common subscript within a raw are not significantly different.

*p<0.05 = significant difference, **p<0.01 = highly significance difference

In the third part of the study total 25 subjects were selected including male and female as an experimental subjects who were fed 150 ml. of non-fermented ARF porridge per day for 30 days and after 30 days supplementation the clinical analysis of blood were estimated. The hemoglobin

and total protein values after supplementation increased which indicated that the iron bioavailability was increased. The hemoglobin and total protein value found higher before and after supplementation among males than females. The blood glucose level shows very minor difference after supplementation compared to initial level. There was very slight decrease in glucose level both in male and female subjects.(Table 1)

CONCLUSION

The study indicated that because of daily intake of amylase rich porridge the digestibility was improved in elder subjects. The hemoglobin level increased because of protein and iron digestibility, minor increase in serum protein level and there was no change observed in blood glucose level. So that product shows the positive effect of amylase rich non-fermented porridge in elderly group.

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