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Formulation and Evaluation of Nutritional Recipes from wheat milk products by using a healthy harvest biotechnology of Germination

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ABSTRACT

The Study had been conducted to investigate some nutrients, enzyme activity in wheat milk and sensory quality of receipts from conventional source of food items. For determining nutrients some tests had been done. Co-agulation time was also checked. Milk was found a rich source of protein and fats. Some amount of minerals were also present. Vitamin-C which was totally nil in wheat milk of soaked grains but there was little amount present in wheat milk of germinated grains. Amounts of nutrients were also found higher in wheat milk of germinated grains as compared to soaked grains. Therefore it was found that non-dairy milks are quite nourished foods. Enzyme activity was also checked and it was also found high in wheat milk of unblanched germinated grains. Two recipes from wheat milk as such while seven recipes each from its products *viz.*, Curd, Khoya, paneer were prepared and evaluated by a panel of judges for their quality attributes. Composite scoring test and hedonic scale method were used and costing was also done for the recipes. They were compared with the market price of the recipes. All the recipes received a positive response and recipes were rated between 'liked moderately' to 'liked very much'. All the recipes were found cheaper as compared to market price. This study had made this fact clear that the non-dairy milks contain more nutrients and developed recipes are liked by judges and they were cheaper too. Valuable contents of these milk be brought to the notice of all because they are a good source of food.

Key Words : Protein, Germination, Scoring test, Hedonic Scale, Co-agulation

INTRODUCTION

Food scientists are very much interested and concentrated in the search of those food materials which are nutritious and cheaper. Now dairy milks are one of the non-conventional source are becoming very popular as these are beneficial for our health. Good example are soya milk (Esceuta, 1981), Coconut milk (Esceuta, 1981) as are very nutritious as well as they are important therapeutically. Therefore, to overcome the problem of malnutrition and starvation it is beneficial to turn out our diet pattern by using these products. Non dairy products such as non dairy milk like coconut milk, wheat milk, groundnut milk, soyabean milk are also nutritious and play an important role in one or the other way. Most of the work has been done earlier on coconut milk, soya milk,

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groundnut milk and so on, while what milk is yet to be searched out by using a health harvest biotechnology of germination. Germination is one of the simplest household bio-technology. It brings about remarkable biochemical changes at nutrients, anti-nutrients as well as enzymatic levels. Therefore, wheat milk was prepared after steeping as well as after germination for a certain period. In some cases when wheat is not recommended then wheat milk may be used. This mild is highly nutritious, rich in proteins and other nutrients. A variety of milk shakes can be prepared, can act as weaning food for infants because it is easily digested and it is a cheaper source with a high nutritional value. The work has been carried out in wheat milk prepared by steeped, germinated and balanced wheat grains. Work has been divided into two groups. Biochemical analysis of wheat milk and Sensory evaluation of certain formulated recipes of wheat milk.

Chemical composition of papaya seeds was determinate by Passera *et al.* (1982) and reported that endosperm and sarcosta of papaya seeds contained ash 4.1 and 11.0 and crude protein 20.5 and 30.5, respectively.

Spendler and Akosinov (1985) studies the gross composition and crude and dietary fibre contents of soups made with African mango seeds. Calculated on the bases of the FAO/WHO/RDA the soups can make a substantial contribution towards achieving the FAO (WHO-RDA) protein but not of energy for young children. The use of non traditional proteins in foodstuffs was studied by Perlen and Dedek (1984) inefficiency, losses and health problems associated with the production of traditional animal protein have led to be exploitation of nontraditional animals and vegetable source of protein as milk, wheat, soya, rapeseed and wood. The production of yeast with single cell micro - organism offers a great potential source of protein to be used in folder and meat products use in fodder increased sharply and technological developments have overcome health risks associated with usage in food stuffs. Effect of germination on nutritive value was studied by Saroja and Vijaya (1986) and they found that nutritive value was increased vitamin C contents and reducing sugar were increased 8.2%.

METHODOLOGY

Wheat (*Triticum valgare*) was used in the present study for the preparation of non-dairy milk. Grains were then soaked for 18 hours and then divided into two parts. Fifty percent of the soaked seeds were again divided into two.Soaked grains were as such used for the preparation of wheat milk while the remaining and Soaked grains were balanced for 5 minutes before making the milk extract.Rest of the fifty percent soaked seeds were germinated for 12 hours and then divided into two groups. Fifty percents germinated grains were as such used for making milk extract. Remaining fifty percent of germinated wheat grains were balanced befoe making milk extract.

Wheat milk of every stage was kept in a container and co-agulation time was checked by visual observation. Ash content was determinate by the method of A.O.A.C. (1960). Moisture contents was determined by the method of A.O.A.C. (1980). Soluble Protein was estimated by the method given by Lowery *et al.* (1961) and modified by Khanna *et al.* (1969). Crude fat was estimated by the method of Folch *et al.* (1957).Total sugars were determined colorimetrically by method of Dubois *et al.* (1949). Astoor and Kind (1954) method was used for estimation of reducing sugar. Clark and Cellip method (Chowdhary and Nagar, 1998) was used for estimation of calcium. Phosphorus estimated by the method of Fiske Subborow (1945). Iron estimation was done by wong method (1928). Ascorbic acid contents was determined by Phenol method (1947). Wheat milk was analysed for their chemical composition and the values were analysed statistically. In order to

produce reliablility in results. The estimations were repeated three times. They were then taken, the deviations from the mean value were calculated by standard errors method described by Gupta (1982). GOT and GPT were estimated by the calorimeter method as described in the kit.

Two methods were used for the sensory evaluation of the preparation, namely composite scoring test and hedonic scale.

Composite Scoring Test requires the evaluators to scrutinize the sample presented and to describe the qualities of the sample (Gatchalian, 1981). In this test, scores are given for various quality characteristics of the sample or product, such as colour, flavor, taste, texture and the total score of these is taken for the overall acceptability of a sample or product (Swaminathan, 1979). This method has been defined by Amerine *et al.* (1965) at an approach which refers to the psychology of pleasurable and unpleasant sate of consumer. Pergam and Pilgirm (1957) defined it as a "Special type of rating scale that measures psychological states directly". This method is actually a measure of acceptability gauged from the reactions in terms of their degree of likeness or dislike for a given product. The reactions are indicated by descriptive words on a scale, e.g. ranging from "like extremely" to "dislike extremely" in a nine point hedonic scale.

RESULTS AND DISCUSSION

In the present study non-diary "wheat milk" was analyzed for ash, moisture, some nutrients like soluble proteins, fats, total sugars, reducing sugars, some minerals and vitamin C, GOT/GPT activity of enzyme and some optimum conditions of enzymes were also studied. Co-agulation time for and germinated wheat grain's milk is similar. There is no significant difference in them but the co-agulation time is more milk of balanched grains because enzyme activity is less in this. The ash contents of wheat milk is ranged from 0.378% to 0.395%. There is no significant difference found between the ash contents of milk of four stages. The moisture contents ranged from 23.82% to 27.26%. Protein contents in wheat milk ranged from 0.907% to 1.25%. For wheat milk it ranged from 0.738% to 1%. The analysis of wheat milk shows that total sugars of wheat milk of various stages ranged from 80-230 mg./100 ml. There is a significant increase of germinated wheat grain's milk. When the reducing sugars of wheat milk of various stages were compared same picture was found. Non reducing sugars are derived by subtracting reducing sugar from total sugars which were ranged from 30-100 mg/100 ml. Calcium obtained by the analysis of wheat milk which were found very less in comparison to dairy milk. Calcium is an important mineral for human being. It ranged from 17.9 mg- 19.7 mg./100 ml.

Table 1 : Representation of nutrient content

Sr. No.	Type of Milk		Ash (g/ 100ml)	Moisture	Pro. g/100ml. Mean ± S.E.	Fats g/100 Mean	Total Sugar Mean ± S.E. (mg/100 ml)	Reducing sugar (mg/ 100ml)	Non-red sugar (mg/100 ml)	Ca (mg/ 100ml)	P (mg/ 100ml)	Fe (mg/ 100 ml)	Vit. C (ug/100 ml)
1.	Milk of soaked wheat grains	Blanched	0.376	23.82%	0.907± 0.04	0.138	180± 0.07	100± 0.09	80± 0.12	17.9± 0.19	102± 0.15	74.2± 0.05	-
		Unblanched	0.38	24%	1.001± 0.032	1.138	210± 0.071	120± 0.11	90± 0.123	18.7± 192	109± 0.13	95.1± 0.09	-
2.	Milk of Germinated wheat grains	Blanched	0.378	26.63%	1.18± 0.044	0.829	200± 0.05	120± 0.05	80± 0.095	18.2± 0.15	104± 0.21	97.3± 0.07	18
		Unblanched	0.392	27.257 %	1.25± 0.05	1.147	230± 0.01	200± 0.08	30± 0.08	19.7± 0.09	112± 0.22	102. ±0.13	-

There is no significant difference in calcium contents was present in 100 ml (Chowdhar and Nagar 1998). Content of wheat milk at various stages ranged from 102 mg to 112 mg/100 ml. It is also clear that wheat milk contains higher phosphorus content (as compared to calcium) which is more than the dairy milk (According to ICMR values). Wheat milk a non dairy milk is found to be richest source of Iron which contain 74.20-102.60 mg/100 ml. while dairy milk is deficient in Iron content (According to ICMR Values). Vitamin-C content of the non dairy milk at various stages were compared and it is found that in wheat milk of soakd grains Vitamin C was nil but after germination Vitamin C was found as 30 ug/100 ml. which reduced due to blanching.

Results show that after germination, enzymes become more active. Blanching has a negative effect on the activity of enzymes. When the activity of enzymes are compared there is no significant difference between the activity of GPT and GOT enzymes. The result obtained from the sensory evaluation of recipes made from wheat milk and its products like Paneer, Khoya and Curd showed that there are no significant difference in the mean total score of all the recipes. The results indicated the fair acceptance of all the recipes. On the basis of results arrived at by analyzing the data. It can be concluded that acceptability result were on the positive side of the hedonic scale which indicated the acceptance of the recipes with non dairy milk by the judge. Hence, it was suggested that keeping in view the nutritive value and general acceptability, these recipes be made use of by the people of all walks of life.

Conclusion :

In present study the work was done on “Wheat Milk”. There are some types of non dairy milk viz.,. Coconut milk, soya milk, wheat milk is also a non-dairy milk which is highly nutritious, rich in energy, proteins and other food for infants, because it is easily digested (Wigmore, 1984) and it is a cheaper source with a high nutritional value. Therefore, wheat milk is used as a supplement in human diets.

The nutritive value of the diet can be increased to a great extent by incorporating value. Use of non-dairy milk can be made to compensate for seasonal fluctuations in developing countries and is solving the food problem to a certain extent. Therefore, inclusion of wheat milk and its products in the diet should be emphasized because of its high nutritive value than dairy milk and the recipes prepared from wheat milk and its products are of low cost too so it can be very helpful in removal of malnutrition in India.

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