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Development and Standardization of Immunity Booster Dairy Product

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Abstract:-Palak paneer is a common delicacy of Indian cuisine. But there are certain limitations with palak paneer regarding color, appearance, flavor, texture and mixing of ingredients. Improving these qualities of palak paneer, palak is incorporated in the paneer with different fixed ratios, i.e: 25% and 50% palak, in order to increase the uptake of palak which is more nutritious. The present study mainly comprises the comparison between original paneer and palak incorporated paneer in respect of the organoleptic characteristics using a 9-point hedonic scale to compare the differences. Among different ratios palak incorporated paneer with 25% has got the more acceptance and this is chosen for further studies regarding nutritional characteristics. Proximate analysis of palak incorporated paneer shows enhanced nutrients in terms of regarding protein, carbohydrate, vitamins and mineral content except for fat content which is reduced compared to control paneer. The main objective of making palak incorporated paneer is to increase the consumption level of Palak by different population groups specially children, who show disinterest in consumption of green leafy vegetables and to improve nutritional composition in diet.

Keywords:- *Palak (Spinach), Paneer (Coagulated Dairy Product), Incorporated Paneer IP1, IP2.*

I. INTRODUCTION

Spinach is considered to be a rich source of iron. Large portion of dietary iron is absorbed slowly from its many food sources, including spinach. Addition of oxalic acid to diet improves iron absorption from foods. As spinach that is high in oxalic acid, increases the uptake of Fe. Spinach has high calcium (around 5% of Ca), which can be absorbed by body. Spinach having high nutritional values and it is extremely rich in antioxidants, especially when steamed or blanched. It is a rich source of Vit E, Vit A, Vit B_6, Vit C, Vit B2, Mg, Mn, Fe, Folic acid, Ca, K, Cu, potassium P, Zn, Niacin, Se and Omega 3 fatty acids. It is a source of Vit B_9 (folic acid), and this Vitamin was the first purified form of spinach. To preserve the folate in spinach, it is better to steam than boiling. Boiling spinach for 4 minutes and more will decreases the folate levels in spinach.

Paneer is a unique type of Indian soft cheese that can be cooked or fried, salted or sweetened. Nutritive value of paneer could be enhanced in terms of iron, vitamin C and fibre by incorporating palak leaves. However, it is deficient in vitamin C, iron and crude fiber. Paneer is having many of the health benefits, it purifies the blood and strengthens it with certain proteins. It helps in bone forming as it contains many of the bone building minerals like Mg, Ca. It can be given to intestinal patients as it does not irritate the intestine.

II. MATERIALS AND METHODS

"Development and standardization of immunity booster dairy product" was fabricated by considering the following point in mind.

- Formulating the immunity boosting dairy based product with different percentages of palak.
- Carry out the organoleptic analysis to determine the ratio with more acceptability.
- Carry out the proximate analysis of palak incorporated paneer.
- Increase immunity levels by using the green leafy vegetables [palak]

➢ *Materials:*

Materials used for preparation of Palak incorporated paneer.

- Palak
- Coagulants
- Milk
- Paneer pressing Machine

- *Coagulant:* Citric acid 1.5%
- *Palak:* Procured from local market (cost Rs.5/ bunch)
- *Milk:* Milk is bought from the local market double toned milk (cost Rs. 30/litre)

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➢ *Method of Preparation:*

- *Preparation of Palak Paste:*

Take fresh palak, clean it thoroughly under running tap water. Remove the stalks and take the leaves. Due to water blanching, there is great loss of green colour. Generally, steam blanching is preferred where no discolouration is found, hence boil the palak without adding water. Make sure that it becomes soft. For better appearance grind it into thin paste.

- *Preparation of Paneer:*

Heat the milk to 80°C with continuous stirring. Add the above prepared palak paste milk before coagulation. Coagulation of milk is the most critical step in paneer making. The quality and yield depend to a greater extent upon the coagulation procedure used.

To coagulate the milk, we followed the procedure adopted by Sachdeva et.al. (1990), wherein the paneer was prepared by heating the milk to an initial temperature of 80^0c, then the temperature was cooled to 70 ^{0}C and 150 mL or Citric acid 1.5% solution was added to 1L of milk and maintained at the same temperature. Then milk is stirred and allowed to cool to room temperature. After a few minutes filter the whey by using muslin cloth and collect the channa. Spread channa evenly in the muslin cloth and place it in the paneer pressing machine for making paneer.

The screw is tightened by rotating in a clockwise direction. The screw will press down the plate and water oozes out through the perforations. Then unscrew the press by rotating in an anti-clockwise direction. Remove the top section and the end plate and unfold the cloth and cut it into desired blocks using a long sharp knife.

Table 1 Different proportions

	Milk	Palak	Citric acid	Product wt.
Control paneer	2L	--	300 mL	187g
Incorporated paneer (1:2)	2L	93.5 g	300 mL	197g
Incorporated paneer (1:1)	2L	187 g	300 mL	212 g

Fig 1 Paneer Press of the Palak Incorporation

Fig 3 Control Paneer, IP1 and IP2 (Clock Wise)

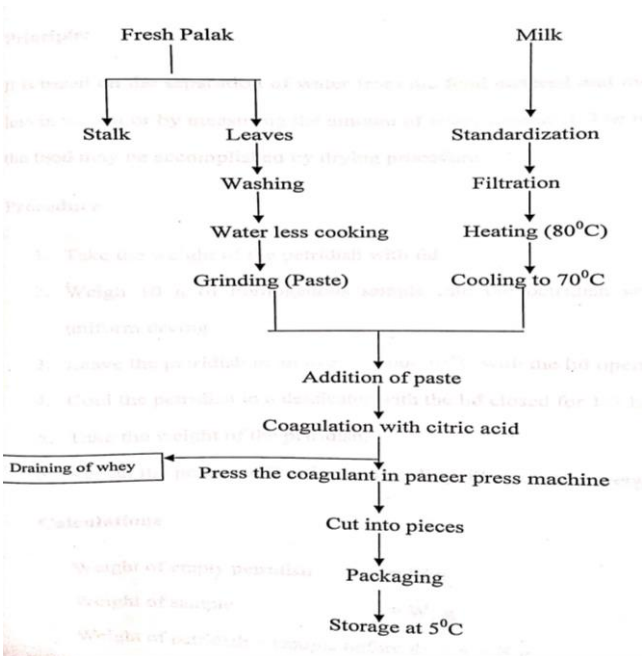

Fig 2 Flow Chart of Immunity Booster Dairy Product

➢ *Proximate Analysis*

Followed proximate analysis was done for the product as – moisture estimated by AOAC method, total carbohydrates estimated by the Anthrone method, protein was estimated by Micro kjedhal method, fat was determined by Soxhlet Method (AOAC, 1990), also estimated total ash, crude fiber and beta carotene of the finished product.

III. RESULTS AND DISCUSSION

A. Nutritional Analysis

Kanawjia (1990) studied about the composition of normal paneer. Its composition is moisture 55%, protein 186, fat 23%, carbohydrates and minerals 2%.

The physico-chemical properties like moisture content, fat, protein, carbohydrate, ash of different formulations is presented as follows:

Table 2 Nutritional Comparison of Control Paneer and Palak Incorporated Paneer Samples

Samples	Moisture %	Protein %	Fat %	CHO %	Ash %	Crude fiber %	B – carotene %
Control	55.2	18.1	23	1.3	2	0.0	15
IP – I	57.2	25	20	2.5	4.0	10.3	18
IP- 2	55.5	30	19	3.1	4.8	12	23

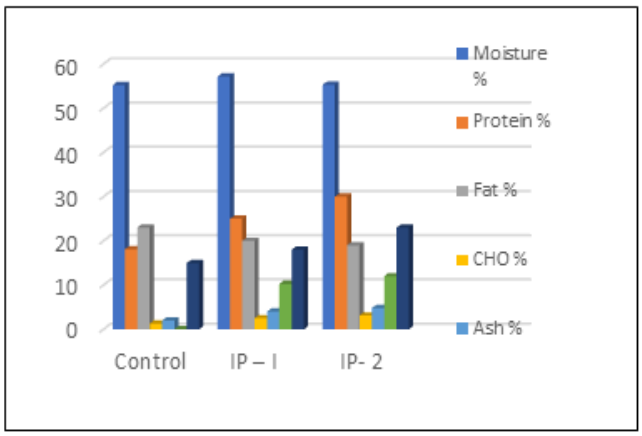

Fig 4 Nutritional Comparison of Control Paneer, IP1 and IP 2

The moisture content of incorporated paneer samples was slightly higher than control paneer. The variations were slight so it may not adversely affect the quality attributes.

The protein content is increased with more incorporation of palak.

Higher the fat level in milk, higher the fat level in channa whey. This explains the reasons for low recovery of fat in paneer from milk. The fat content of the product decreased with the increase in palak incorporation.

The ash content of the product increased with the palak incorporation.

As paneer do not have crude fiber and it showed an increase with the incorporation of palak.

The B-carotene content also increased with incorporation of palak.

B. Sensory Analysis:

Sensory Evaluation was carried out by using 9 scale hedonic rating in which various attributes of the products were evaluated. The results were given in the following table.

Table 3 Sensory Score of Control, IP I, IP II Palak Incorporated Paneer Samples

Sample	Colour	Taste	Texture	Flavour	Overall acceptability
Control	7.25	7	7.25	7.5	6.75
IP 1	8.0	8.0	8.5	7.25	8.0
IP 2	7.0	6.25	7.5	6.5	6.5

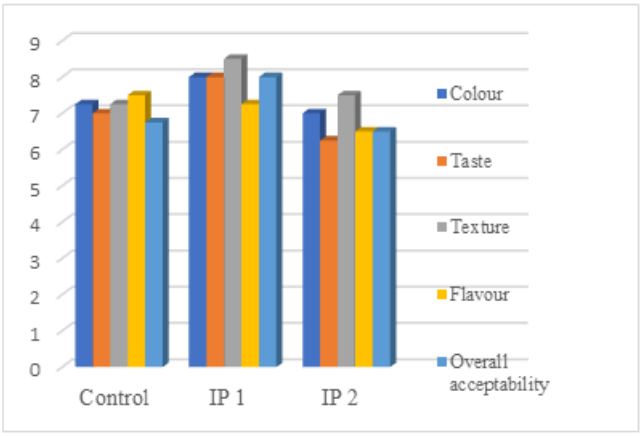

Fig 5 Organoleptic Comparison of Control, IP 1, IP II

The color, taste and texture of IP1 (25%) was found highest as compared to control and IP2 (50%), but as we can see in above table the flavor characteristic of IP1 was found to be less than control but was higher than IP2. Now finally the overall acceptability of IPI was found superior to both control and IP2.

C. Stability Study:

Stability studies was done at room temperature (30^0 to 35^0C), refrigeration conditions (0^0 to 5^0C) and freezer conditions (at -18^0C).

As dairy products and leafy vegetables are perishable goods, but by making the products with this combination we are able to extended the shelf-life of the product at, refrigeration conditions (0^0 to 5^0C) for maximum 3 months and in freezing conditions (at -18^0C) maximum 6 months. Due to perishability of the product at room temperatures maximum 3 days only its look like fresh, after that we have observed colour change to yellowish, water oozed out, pack became bulky.

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IV. SUMMARY

India is one or the largest producers of milk in the world. Paneer is one of the most fascinating, popular attractive food products for vegetarian as well as non-vegetarian. Utilization of paneer is very wide due to its high nutritive value which in turn helps the preparation of different types of food products as well as bakery products. Palak is cheap in cost but highly nutritious green leafy vegetable.

Incorporation of green leaf (palak) to paneer not only increases the nutrient content but also enhances the shelf life. Our present study was undertaken for the preparation and evaluation of green leaf (palak) incorporated paneer. Experiments were carried out in the food technology department and in food chemistry and nutrition department.

The protocol followed and the results are summarized below:

- All the formulations were prepared according to the standard procedure.
- The formulation prepared was analyzed to study their proximate composition and the overall acceptability of the product.
- The paneer prepared with incorporation of palak shows significant increase in crude fiber, protein, carbohydrate, vitamin and mineral content except fat and cholesterol which almost remains constant.
- The formulation exhibited higher score for sensory attributes. They are liked moderately by the sensory panelists.

V. CONCLUSION

The ever-increasing awareness among the consumer for nutritious, healthy and quality food and the consumption in market have compelled the food industry have to search for those ingredients which can provide special nutritive value and as well as adequate health benefits in order to sell their products profitably by gaining consumer trust and satisfaction.

From the result of the present study, it can be concluded that palak incorporated paneer is more nutritious compared to the normal paneer. Form sensory evaluation results it can be concluded that palak incorporated paneer has good acceptability. Palak incorporated paneer with the ratio 25:75 of palak and paneer was found the best. Therefore, it is suggested that only 25% of palak incorporation with paneer is best for the preparation of immunity booster dairy product and received high acceptability in among the all trails. And also having high amount of Beta-carotene, fiber, also having good amount of minerals like calcium, Iron, magnesium, potassium, folates. Palak incorporated paneer is economical in terms of value addition.

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