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Studies on cost of production for soya based spread with addition of different levels of sunfiber and glycerol monostearate

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Abstract
A study was undertaken with the objective of estimating the cost of production of soya spread prepared by soya protein isolate. A total of 8combinations of soya protein isolate, glycerol mono stearate & sunfiber were prepared in five replication. All the standard ingredients were purchased from local market and scientific corporation, Allahabad. The result of the study revealed that the production of cost of spread containing 7% soya protein isolate was lower Rs. (571.2/kg) compared to spread containing high level of soya protein isolate Rs. (794 /kg.),which may be attributed to higher protein content and cost of soya protein isolate and sunfiber.

Keywords: Soya protein isolate, spread, sunfiber cost of production

1. Introduction
Isolated soybean proteins, or soybean protein isolates as they are also called, are the most concentrated form of commercially available soybean protein products. They contain over 90% protein, on a moisture free basis.
Soy protein isolates have been known and produced for industrial purposes, mainly as adhesives for the paper coating industry, well before World War II. ISP's for food use, however, have been developed only in the early fifties.
The basic principles of ISP production are simple. Using defatted soy flour or flakes as the starting material, the protein is first solubilized in water. The solution is separated from the solid residue. Finally, the protein is precipitated from the solution, separated and dried. In the production of ISP for food use, in contrast to ISP for industrial use, care is taken to minimize chemical modification of the proteins during processing. Obviously, the sanitary requirements are also much more demanding.
The typical composition of an isolated soy protein is shown in Table 1.

Table 1: Typical composition of ISP (Moisture-free basis)

Component	Weight Percent
Protein	90
Fat	0.5
Ash	4.5
Total carbohydrate	0.3

Source: Kolar *et al*. (1985)

Sunfiber is a galactomannan based soluble dietary fiber made from hydrolyzed guar gum. It is a versatile powder that can be easily added to a wide variety of foods, beverages and supplements. Sunfiber does not impact the flavor, color, texture, or aroma of the products to which it is added. It offers an easy way to increase fiber in the diet using consumer's favorite foods and beverages.
Sunfiber is a truly regulating dietary fiber that helps to normalize the digestive system. It is clinically shown to be effective at regulating occasional diarrhea and occasional constipation. Sunfiber is an excellent prebiotic for maintaining digestive health and microflora balance. It is tasteless, colorless, odorless, gluten free, and 100% water-soluble.
The Reference Daily Intake (RDI) for fiber is 25 grams per day, based on a 2,000 calorie diet. The average diet intake is approximately 11 grams per day. Sunfiber is a prebiotic fiber that is unique in comparison to other non-galactomannan based fibers.

2. Material and Methods

The experimental work was carried out in the research laboratory of department of Dairy Technology, Warner College of Dairy Technology, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad. Soya protein isolate, Glycerol Mono starate and sun fiber were obtained from the local market of Allahabad city. Soya spread prepared by soya protein isolate, Glycerol mono stearate and sun fiber in different levels. There were total eight combinations. Each was prepared in five replications. The different treatment combinations used in the experimental are as follows:

S1G1F1=Soya Protein Isolate (7%) +Glycerol MonoStearate (0.3%) +sun fiber (4%)
S1G1F2=Soya Protein Isolate (7%) + Glycerol Mono Stearate (0.3%) +sun fiber (6%)
S1G2F1=Soya Protein Isolate (7%) + Glycerol MonoStearate (0.6%) +sun fiber (4%)
S1G2F2=Soya Protein Isolate (7%) + Glycerol Mono Stearate (0.6%) +sun fiber (6%)
S2G1F1=Soya Protein Isolate (9%) + Glycerol MonoStearate (0.3%) +sun fiber (4%)
S2G1F2=Soya Protein Isolate (9%) + Glycerol Mono Stearate (0.3%) +sun fiber (6%)
S2G2F1=Soya Protein Isolate (9%) + Glycerol MonoStearate (0.6%) +sun fiber (4%)
S2G2F2=Soya Protein Isolate (9%) + Glycerol Mono Stearate (0.6%) +sun fiber (6%)

Spread was prepared by soya protein isolate in prescribed level of protein Sun fiber as dietary fibre at different levels were mixed with aqueous phase A fat blend consisting of milk fat and vegetable oil blend was prepared separately. Calculated amount of fat blend was mixed with aqueous phase for emulsification. Different type and levels of emulsifiers were used to provide a stable emulsion. The pH of prepared emulsion was adjusted to 5.2 using lactic acid as acidifying agent the emulsion was then be pasteurized, cooled and packed in suitable containers. Type and level of additives were selected through sensory characteristics and textural analysis. The table spread prepared using selected level of ingredients was used further for selection of level of salt and flavouring material. The level of salt and flavouring material was selected based on sensory evaluation of the product .The final product was subjected for estimation of the cost of production. Numbers of treatments were 8, which were replicated 5times.The cost of prepared product was calculated at the prevailing prices of raw materials purchased from the local market of Allahabad.

3. Result and Discussion

The costs of the ingredients are very important factor besides other factors in determining the cost of production. It is considered as basis for price fixation and determines the profit. The price of the product is depend on the cost of the production. The cost of experimental soya spread was calculated, which is shown in the table belo

Table 2: Cost of production for soya spread Prepared by soya protein isolate, sunfiber & glycerol monostearate

Treatment	Cost of Ingredients Used In Spread Rate/Kg (Rs)							
	SPI (Rs./kg)	SOYA BEAN OIL (Rs./lit)	GMS (Rs./kg)	SUNFIBER (Rs./kg)	SALT (Rs./kg)	SMP (Rs./kg)	Overhead charges@20%	COST /KG (Rs)
S1G1F1	75	40.9	0.9	324	0.2	35	95.2	571.2
S1G1F2	75	40.9	0.9	487	0.2	35	127.8	766.8
S1G2F1	75	40.9	1.8	324	0.2	35	95.3	572.2
S1G2F2	75	40.9	1.8	487	0.2	35	127.8	767
S2G1F1	97	40.9	0.9	324	0.2	35	99.6	597
S2G1F2	97	40.9	0.9	487	0.2	35	132.2	793
S2G2F1	97	40.9	1.8	324	0.2	35	99.7	597
S2G2F2	97	40.9	1.8	487	0.2	35	127.2	794

Gms=Glycerol Monostearate
Spi=Soya Protein Isolate
Smp=Skim Milk Powder

The production cost ranged depending upon the price of the ingredients in experimental soya spread. It can also be observed that the highest mean cost (Rs.)was recorded in soya spread prepared by soya protein isolate with different level of emulsifier and dietery fiber in sample of S2G2F2Rs (794) followed by S2G1F2Rs (793) ,S1G2F2Rs (767) ,S1G1F2Rs (766.8), Rs S2G2F1(597), S2G1F1Rs (597), S1G2F1Rs (572.2), S1G1F1Rs (571.2).

4. Conclusion

It can be concluded from the above study that soya protein isolate and sun fiber added functional properties to the spread hence increasing the nutritional value of spread .Although The cost of production is high yet it should be promoted for further production keeping in view of its nutritional and therapeutic use.

5. References

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