

New Developments in Soy Value Added Products



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VALUE ADDED PRODUCT

The Food Processing Sector

Food processing adds value to the agricultural produce starting at the post harvest level. It includes even primary processing like grading, sorting, cutting, seeding, shelling packaging etc.



What is VALUE ADDED ?

- Value-added describes what happens when you take a basic product and increase the value of that product (and usually also the price) by adding extras in the manufacturing process, or by tacking on extra products and/or services.
- An activity is considered value-added when some customer is willing to pay more for the additional output.

Soybeans have been used as food for over 2000 years

- Chinese discovered
- Cultivated wild soybeans
- Evidence shows Chinese first made tofu & soymilk as long ago as AD 220



Soybeans Protein

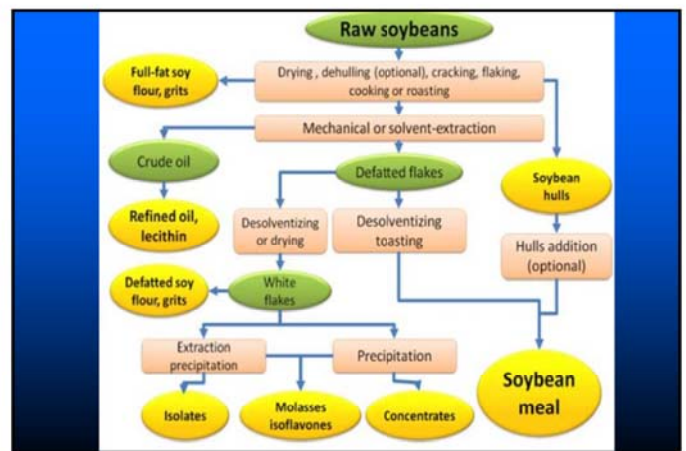
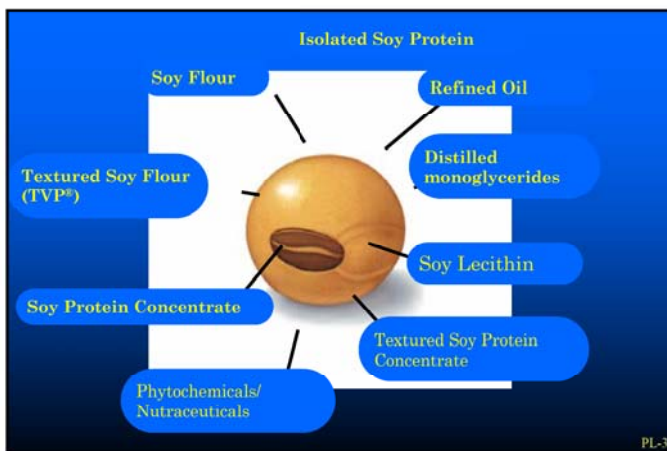
- Soy is unique because the protein in soy products processed in ways that retain protein integrity
- This protein could be compared with protein found in meat, milk, and eggs, etc
- Soy protein contain all essential amino acids in sufficient quantity to support normal growth and development

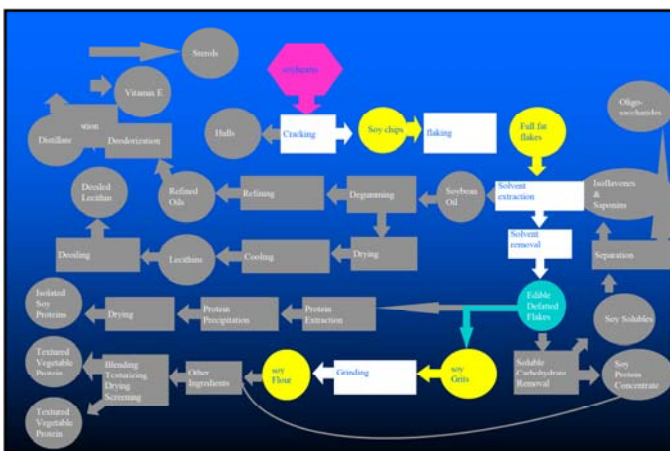
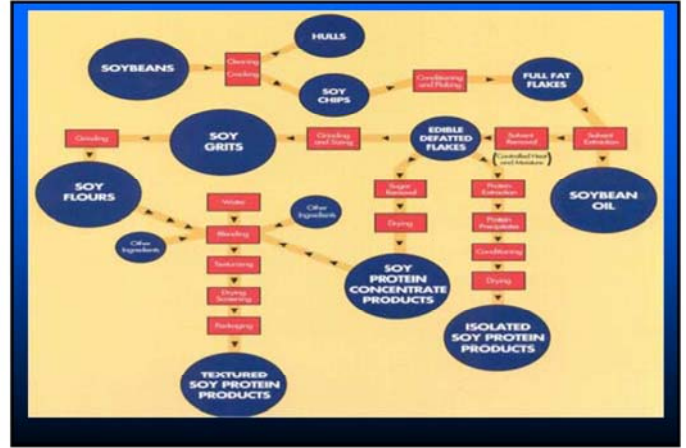
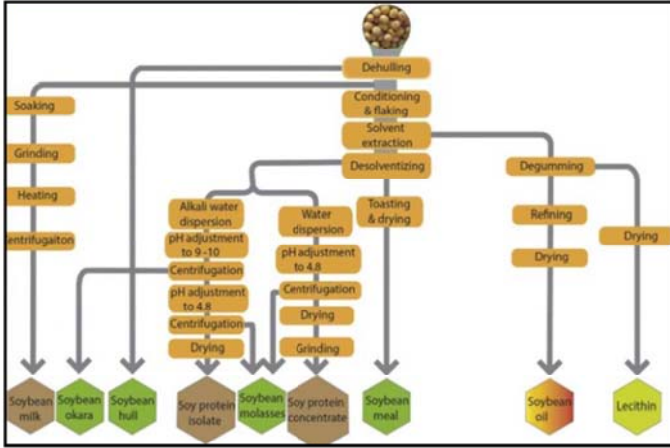
100% SOY PROTEIN

Amount Per Serving		Vitamin A	
Serving Size 1 Scoop (30.3 g)		100%	
Serving Size Per Container 30		100%	
Calories 130		Vitamin C	
Calories from Fat 15		100%	
		Calcium	
		100%	
		Iron	
		100%	
		Zinc	
		100%	
		Selenium	
		100%	
		Copper	
		100%	
		Manganese	
		100%	
		Potassium	
		100%	
		Sodium	
		100%	
		Magnesium	
		100%	
		Phosphorus	
		100%	
		Total Carbohydrate	
		100%	
		Dietary Fiber	
		100%	
		Sugars	
		100%	
		Protein	
		100%	

Hundreds of new soy based products can be developed for Value Addition in India

- Soymilk beverages
- Soy based fruit juices
- Soymilk yogurt
- Soy-based cheese
- Soy-based ice cream
- Soy-based puddings
- Tofu, plain and prepared
- Meat alternatives
- Soy ground meat
- Soy based Cereals
- Snack bars
- Soy cookies
- Soynuts
- Soynut butter
- Soy breads
- Soy supplements
- Soy snack foods
- Soy water!





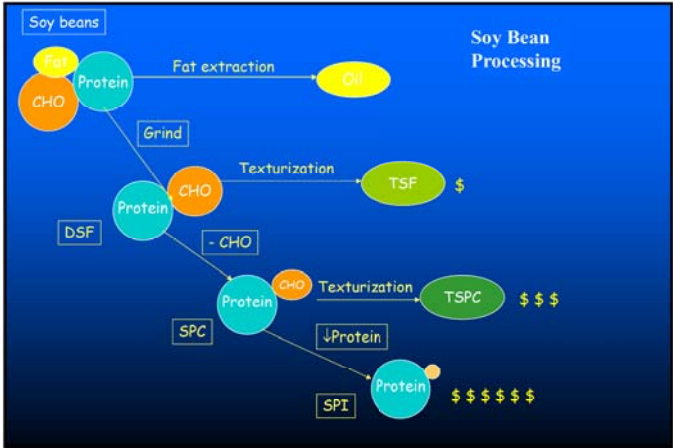
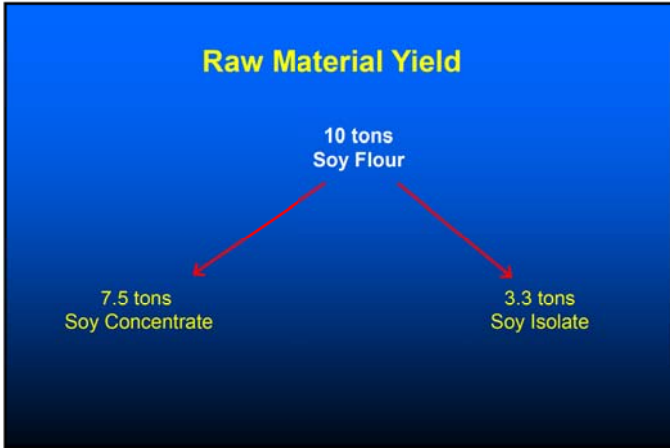
Whole Soybeans

Remove	Resulting product
■ Soy hulls	Full fat soy flour
■ Soy hulls + oil	Defatted soy flour
■ Soy hulls + oil + soluble carbohydrates	Soy concentrate
■ Soy hulls + oil + all carbohydrates	Soy isolate

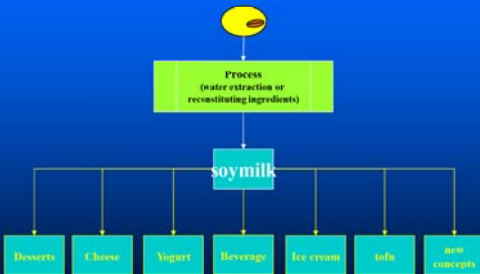


Relative Raw Material Costs

Raw Material	As-is Cost Ratio	Protein Cost Ratio
Soy Flour	1.0	1.0
Soy Concentrate	2.0-2.5	1.5-1.9
Vital Wheat Gluten	3.0-4.0	2.0-2.8
Soy Isolate	5-7	2.8-3.9



Soy-based Dairy Alternatives



Soymilk Beverages

- Soymilk is the most explosive category in the history of the soy foods industry



Soymilk is now available shelf-stable and refrigerated packaging

- Aseptic soymilk is sold on a grocery shelf without refrigeration
- Pasteurized soymilk is sold refrigerated in the dairy case next to cow's milk



Soymilk in ESL Milk Cartons

- Extended shelf-life (ESL) soymilk in milk cartons is the fastest growing segment of the soymilk market
- Most often sold next to cow's milk or premium milk products in the refrigerated dairy case



Soy milk in Plastic Bottles

- After the success of refrigerated ESL
- Now we can find soy milk products, in refrigerated plastic bottles



Soy milk in Single Serve (New Concept Packaging)

Competition for shelf space and position among the major brands is leading to the use of new concept packaging for soy milk as a snack food/single serve beverage



Happy Hearts just love **WEST SOY**

Great Tasting WESTSOY Soy milk doesn't miss a beat.

MONEY SAVING COUPON INSIDE!

www.westsoy.biz

Soy Yogurt

- Soy yogurt has gained acceptance with consumers due to improved flavoring and packaging
- Cow's milk yogurt fortified with soy protein has now entered the market





Soy Yogurt Drinks

- Soy yogurt drinks and other forms of fermented soymilk beverages, such as kefir, have been introduced
- Offers additional health benefits (active bacterial cultures, modified isoflavones)



Cultured Soy Drinks



Soy-based Ice Cream



Soy-Based Cheese

- ❑ Soy-based cheese alternatives grew with a strong showing in supermarket sales
- ❑ Leading brands offer a wide range of product and package options



Soy Tofu

- ❑ Has a bland taste
- ❑ Used in dishes, from main courses to desserts
- ❑ High in protein and calcium
- ❑ Moderate in fat



Soy tofu can be processed in different shape and texture, soft or firm or cheese like

Tofu – Ready to Cook Meal



Tofu - Plain vs. Seasoned

- Tofu can be processed with local flavor or ethnic flavor depending upon the market



Soymilk-Based Desserts

- Soymilk is used as a dairy replacement in puddings and other desserts
- Formulations and processing are nearly identical to using cow's milk
- Can be processed to be shelf-stable or refrigerated products



New Product Concepts

- Any number of new product concepts using soymilk or soy protein as a base are possible
 - Smoothies
 - Soy coffee
 - Soy cream based soups
 - Spreads
 - Creamy dressings
 - Any product usually made with dairy milk





Meat Alternatives



Soy-based Meat Alternatives



LightLife
 MEATLESS
 FAT FREE
 CHOLESTEROL
 FREE

Rich in Soy

See how we're selected for 100% of the products that include Soy of soy protein in this. May reduce the risk of heart disease. See LightLife® website for more.

100% HALVEVE
 NET WT 4.17 (118g) (1.17oz)

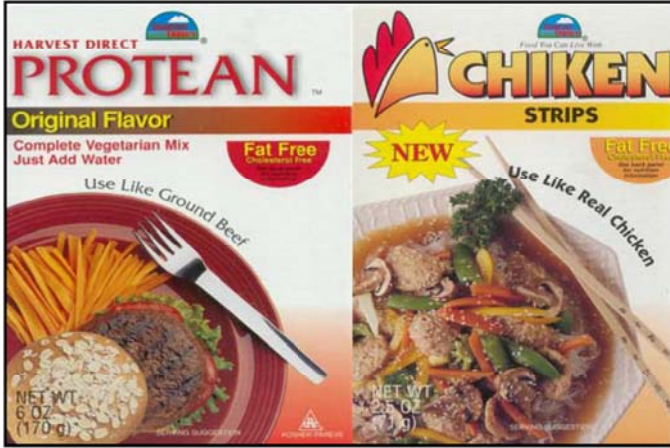
MORNINGSTAR
 Farms
 Grillers Prime
 100% Pure Beef Taste

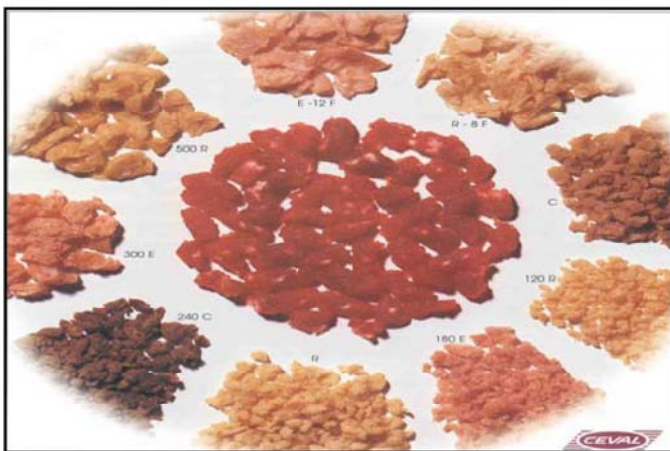
Delicious house-smoked kanihanga flavor

FOUR PATTIES NET WT. 10.02 (283g)









Meat Analogs from Textured Soy Protein Products

Application Examples of Minced Texturized Soy Protein

Vegetarian Soy Protein Sausage

Ingredients: textured soy protein, Whey protein, soy protein isolates, Soybean oil, soy sauce, vegetarian seasonings, allura red AC



Meat Analogs from Textured Soy Protein Products

Application Examples of Strips Textured Soy Protein

Vegetarian Savory Stewed Soy meat

Ingredients: textured soy protein, Mushroom, Whey protein, soybean oil, Vege. seasonings & Vege. species



Structured Meat Analog

Size: 6 – 20 mm

Layered structure

Water absorption: 3 X

Rehydration time

15 minutes in boiling water



Structured Meat Analog Application

Layered meat like structure make it good for:

- ✓ Vegetarian diced meat dishes
- ✓ Vegetarian stew-meat
- Typically dried after extrusion resulting in a very shelf stable product
- Product is re-hydrated by the food processor or by the end user
- Product is usually flavored in the process of re-hydration



Fibrous Soy Protein



- Size: 6 – 20 mm
- Fibrous structure
- Water absorption: 3 X
- Used to make restructured meat analogs



Meat Analogs from Fibrous Soy Protein

- Fibrous, muscle fiber-like structure of this product makes it good for:
 - ✓ Restructured vegetarian meat
 - ✓ Restructure vegetarian jerky

Using Fibrous Soy Protein

Hydrate
FSP

Extract
Fibers

Add Binders, oil,
flavors, etc.

Freeze

Form and
Steam Cook



Application Examples of Fibrous Soy Protein

Vegetarian Half a Chicken

Ingredients: soybean fiber (FSP), Soy Protein Hydrolysate, soybean oil, salt, Vegetarian seasonings

Cooking Method:

- Open the bag and steam for few minutes
- Slice and serve
- Barbeque
- Stir - Fried
- Deep - Fried
- Stew



Application Examples of Fibrous Soy Protein

Vegetarian Ham

Ingredients: soybean fiber (FSP), vegetable oil, pure vege. Seasonings (hydrolyze vegetarian protein, sugar, salt Soy sauce powder, spirulina powder, natural seasoning)



Application Example of Fibrous Soy Protein

Vegetarian Fish



Ingredients: soybean fibre (FSP), vegetable oil, salt, sugar, pure vegetarian seasoning, seaweed.

www.hkkamkee.com

High Moisture Meat Analog

Size: 12 mm thick X 80 mm wide

Layered and fibrous structure

Meat-like composition

60-70% moisture

2-5% oil

10-15% protein

Must be frozen or retort packaged

Size and shape similar to a cut of meat



HMMA



HMMA Products

Vegetarian Stakes



HMMA Products

Vegetarian Ham



HMMA Products

Chicken - Like Meat Analog





Application Examples of HMMA



Pot Pie



Fettuccine



Bar-B-Q





Soy Juice in ESL Milk Cartons

- Extended shelf-life (ESL) soy juice in cartons is getting very popular in different countries

SOY apple
SOY apricot & peach
SOY strawberry
SOY tropical

Soy-based Energy Bars

- Soy protein has become a major selling point in energy and meal replacement bars
- Most use health claims related to heart disease

CLIF
GeniSOY Soy Protein Bar
Heality

Soy-based Energy Bars



Soy-based Energy Bars

Some bars are positioned as helpful specifically for woman



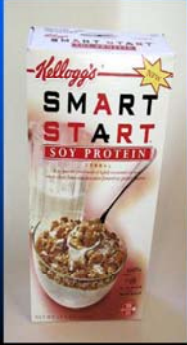
Soy Based Protein Powders



Soy Snack Bars



Soy Fortified Breakfast Cereals



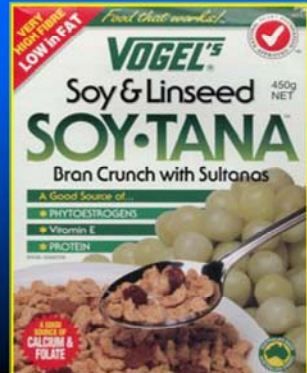
- A wide array of cold cereals made with grains and soy proteins were introduced in the past 5 years
- Leading companies such as Kellogg's, General Mills and Quaker Oats get into the act



Soy Fortified Breakfast Cereals



Soy Fortified Breakfast Cereals



Soy Fortified Breakfast Cereals






"Other" Soyfoods to Grow

- There are a number of emerging product categories that offer strong growth potential over the next few years

Soy nuts
Soy nut butter
Fermented soy products
Soy chips and snacks
Frozen green soybeans
Frozen entrees with soy
Soy-enriched baked goods and breads

Soy Nuts

- Soy nuts are roasted soybeans
- Similar in texture and flavor to peanuts
- A good source of protein and isoflavones
- Can be sprinkled with: salt, garlic, chili powder, and onion powder


Flavored Soy Nuts

- Soy nuts may be coated with different flavors
- They may also be baked to make them lower in fat than the fried ones.



Different Flavors of Soy Nuts



Soy Nut Butter

- Soy nut butter is a peanut butter substitute made from roasted soy nuts. It has a bit less fat than peanut butter and much less flavor



Soy Spread



Fermented Soy Products (Tempeh)



- Tempeh is an Indonesian meat substitute made from soybeans and other grains that have been injected with a mold and allowed to ferment
- It's rich in protein and fiber and has a chewy texture and salty, nutty flavor



Fermented Soy Products (Natto)



Natto is made with fermented soybeans. It is sticky and highly nutritious. Serve it on rice or put it in sushi or in soups.



Miso



- Used as a condiment in Japan
- Made out of soybeans, *Aspergillus oryzae*, salt and rice/barley
- Used to enhance flavor of foods like soups, sauces, broths and different dishes



Soy Flour

- ❑ Thickener
- ❑ Nutritional value improver
- ❑ 10- 20 % baking flour substitute
- ❑ Noodles, pancake flour, frozen desserts and coffee whiteners



Soy Breads and Cakes

- ❑ Variety of soy breads and cakes are in the market



Soy Cookies



Soy Snack

Soy protein has become a major selling point in snack foods







Whole Soybeans

- ❑ Wide variety of colors: yellow, green, brown, and even black
- ❑ Remain firm during cooking and provide a pleasant broth-like flavor to stews, soup stocks, and stir-fries
- ❑ Rich in protein and fiber



Application of Soy Protein Products in Cereal-based Foods

Product	Soy Flour	Concentrate	Isolate	Textured Soy Protein
Bread	✓	•	•	•
Bread (special)	✓	✓	✓	•
Pasta and Noodle	✓	✓	✓	•
Cookies and Crackers	✓	✓	✓	•
Cakes	✓	✓	✓	•
Pastries	✓	✓	✓	•
Breakfast Cereals	✓	✓	✓	•
Snacks	✓	✓	✓	•
Milk Replacer	✓	✓	✓	•

Source: Soy protein products. Characteristics, nutritional aspects and utilization. Soy Protein Council, Washington, DC, 1987.

Application of Soy Protein Products in Dairy-based Foods

Product	Soy Flour	Concentrate	Isolate	Textured Soy Protein
Milk replacers	✓	✓	✓	•
Cheese	•	✓	•	•
Yogurt	•	✓	•	•
Coffee whitener	•	✓	•	•
Frozen desert	•	✓	•	•
Whipped topping	•	✓	•	•
Infant formula	✓	✓	✓	•
Beverage powders	•	✓	•	•

Source: Soy protein products. Characteristics, nutritional aspects and utilization. Soy Protein Council. Washington, DC. 1987.

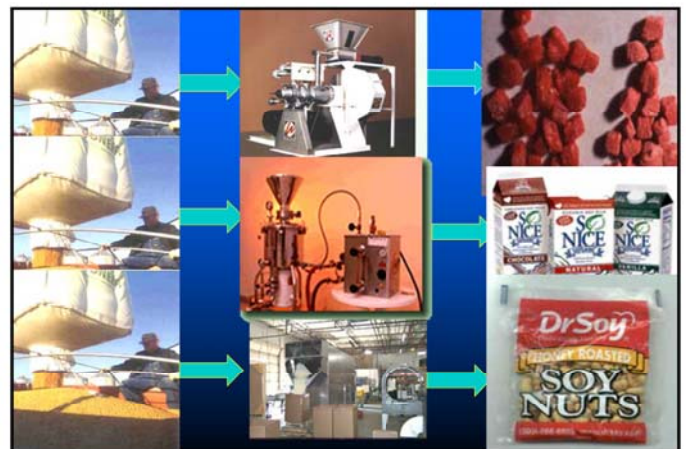
Application of Soy Protein Products in Meat-based Foods

Product	Soy Flour	Concentrate	Isolate	Textured Soy Protein
Bologna, frankfurters	•	✓	✓	•
Miscellaneous sausage	•	✓	✓	•
Meat balls	✓	✓	✓	✓
Patties	✓	✓	✓	✓
Pizza toppings	✓	✓	✓	✓
Analogs	•	✓	✓	✓
Meat bits	•	✓	•	✓
Poultry	•	✓	•	✓
Seafood	•	✓	✓	✓

Source: Soy protein products. Characteristics, nutritional aspects and utilization. Soy Protein Council. Washington, DC. 1987.

Soy Value Addition

- > **Economic Benefits**
- > Buy the raw materials in tons (bulk quantity)
- > After adding processing sell in grams or liter
- > Only cost involved is processing
- > Raw material is very cheap (not a significant part of the investment)
- > In other words soy food business is license to print the money



Conclusion

Value Addition for Soy Industry in India

Wide variety of Indian food with soy is possible

- ❑ Based on the examples discussed Indian food Industry can develop several foods for their population
- ❑ These foods can be fortified with soy protein to add the value
- ❑ If developed properly these foods will not taste differently