

# The Development of Soybean Products



Soy bean is a notable source of protein, fat and mineral content. When grown successfully will provide more protein and a better balance of amino acids than in many vegetables. The oil content is cholesterol free and 85% unsaturated and a desirable source of calories. Traditionally soybean has been widely utilised and developed as a major food in varieties of dishes of ancient China. Today, extensive researches have expanded the versatile benefits and economic successes of soybean to human and animal consumption, and environmental considerations.

## Traditional utilisation

Previously, soybean has been planted exclusively for vegetable oil and the defatted soybean remains were used for forage and green manure. The production of soy products in China developed from the production of soymilk and its associated products such as bean curd or "tofu", "Yuba" in Japan and "fuchok" (Cantonese) in Malaysia. Fermented products, involved micro-organisms such as soy sauce, miso and fermented "tofu", "natto" in Japan and, the Indonesians with specialities in "tempe".

## Advance development

### • Incorporation

Soya bean, legumes and cereals contain all the essential amino acids except the cereals are lack in lysine and legumes in cystine and methionine. However, incorporation methods have improved their protein contents. Whole soybeans can produce a range of beverages, snacks, canned vegetable and meat products and fermented foods.

### • Refining

Soybean oil is the world's leading refined vegetable oil and major uses in salads, shortening, margarine, lecithin, fatty-acids and glycerol. Recent innovations are as pesticide and insecticide carrier, replacing water for ultra-low volume applications.

### • Extraction

Soybean meal is used in mill feed for vitamin, antibiotics and drugs. Edible soy protein in soybean meal is extracted from soy flour and

grits; soy protein concentrates and soybean isolates as follows:

### • Soy flour and grits

Contains ~41% protein for full-fat flour and the removal of hull and oil fractions to produce ~ 50-51% protein in ground defatted soy flakes. The flour can be incorporated in bakery as a bleaching agent, flavour and dough improver, a non-fat dry milk substitute, low water activity properties in extending the shelf-life biscuits and prevent sogginess in fried doughnuts, baby foods and as a protein supplement. Controlled protein contents in grits is used in meat patties.

### • Soy protein concentrate

Contains ~70% protein and manufactured into different particle size and removing the soluble sugars that cause flatulence. The concentrates are used in processed meat products, bakery products, cereals, convenience and baby foods.

### • Soy protein isolates

Contains 90 - 97% protein by removing both the soluble and insoluble carbohydrates from soy flour. The isolates are used for dairy products such as toppings and creamer.

### • Fabrication

The soy meal compounds are spinned to

produce textured soy protein foods and meat analogues. The look alike meat but not in flavour have been fabricated in today's sausages and burgers serving many vegetarians. This also forms the basic ingredients in many chips, dips and spreads.

### • Fortification

Fortification of essential amino acids into soybean milk in "fuchok" or soy protein-lipid film (SPLF) production could be extended to other nutrients, vitamins and minerals. The brittleness and poor reconstitution properties were eliminated by incorporating glycerol to produce an intermediate moisture product with improved physical properties.

### • Potential micro-organisms

Improved preliminary screening of potential micro-organisms capable of utilising soybean waste with increased essential amino-acids content is a great challenge to food engineering.

With controlled techniques of incorporation, refining, extraction, fortification, fabrication, supplementation and engineering of soy protein in value-added foods had helped to decrease malnutrition, prevent overlooking other natural products and will lead to the success of more development and utilisation of soybean as well as improving the economy.



Variety of products from soybean.