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Review Article

SOURCES, PROPERTIES AND TYPES OF FOOD PROTEINS

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Sources and Properties

The concept of functional proteins was not born until the 1950s and, initially, the only commercially-produced functional proteins were merely dried fresh foods, for example dried egg white and non-fat dried milk. These products were similar to their fresh counterparts and no attempt was made in food industry to purify or fractionate proteins. The use of purified proteins was first achieved in other industries. For example, casein had been produced for many years piror to its isolation for food usage for plastic production and paper coating.

The production of functional proteins accelerated in 1960s with the production of soya isolate and sodium caseinate. In the case of soya, food grade protein production was an alternative to selling as animal feed the resulting from oil pressing/extraction (Smith and Circle, 1978). For caseinate, major advances were made in the design of plant, which made feasible the production of high-grade edible quality products (Muller, 1982). Twenty years later, soya proteins and caseinates are used in a vast range of food products from bakery to meat and artificial dairy products, and can now be called the first generation of functional proteins.

Soya proteins, caseinates and dried egg white are now regarded as the standard functional protein; between them they perform well all the major functional properties, and all novel proteins are compared in performance against these standard types. Egg white foams well and gels on heating; sodium caseinate is a good emulsifier and soya isolate holds or binds water well. For a novel protein to succeed well in the market place, it must either outperform well one of these standard proteins or give a good performance and be much cheaper.

SECOND GENERATION PROTEINS

Whey protein:

During 1970s Whey protein a promising new comer to the functional protein market which they usually have high solubility, good whipping and gelling properties and can be bland. They can be used as the ideal replacers of egg albumen.

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Blood proteins:

The functions of blood of dried plasma (i.e. blood without red cells and fibrinogen) proteins are excellent. It has high solubility and good whipping and gelling properties. The major drawback on the conventionally dried plasma is its very strong odour and taste. This restricts its use even in meat products. These off-flavours are probably caused by lipids and/or breakdown products.

Single cell protein:

Although single cell protein may be of high quality, it is often enclosed in an indigestible cell wall, which makes it unavailable this is particularly true with algal protein (Hedenskog and Mogren,1973).

OTHER ALTERNATIVE SOURCES OF PROTEIN

Fish protein: Disadvantage of off flavor and high cost

Leaf protein: Presence of β-carotene and chlorophyll gives the product a green appearance and an off-flavour (Pirie, 1982).

Potato protein: Protein from potato is of good quality but is associated with toxic alkaloid solaline. Product produced from potato protein had an earthy, raw potato flavor.

Bone proteins: These proteins are ideal for incorporation into meat products, such as hams and burgers, as they impart excellent binding properties they do not suffer from off-flavours. The hurdle is only small quantities are produced and they are expensive.

Wheat gluten: The classical functional protein is wheat gluten. For centuries the functional properties of gluten have been applied to produce the characterstics qualities of bread.70% of produced wheat gluten goes to bakery products. The second largest use in breakfast cereals. Gluten is also claimed to be the ideal protein for binding together small pieces of waste meat into reconstituted meat chunks (Siegal *et al.,* 1979).

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