SHAPED TEXTURED PROTEIN FOOD PRODUCT

BACKGROUND OF THE INVENTION

1. Field of the Invention

The field of this invention relates to textured protein food products, particularly meat analog food products formed from texturized protein.

2. Description of the Prior Art

Heretofore much work has been done to provide satisfactory meat analog food products. Meat analogs, or in other words simulated meats, are generally formed from texturized protein particles.

A variety of prior art processes are known for "texturizing" vegetable protein, i.e., imparting to vegetable protein the chewy toughness and mouthfeel associated with meat, and assembling the texturized protein into familiar meat forms to provide meat analog products. For example, meat analog products can be made by processes involving fiber spinning or thermal plastic extrusion.

The fiber spinning technique is an adaptation of the spinnerette method of making synthetic textile fibers. In the meat analog adaptation of this method, fibrous textured protein products are prepared from proteins such as soy protein by forming a spinning dope from alkali solubilized protein and extruding the dope through a perforated die (spinnerette) into an acid (isoelectric) precipitating bath. The acidic bath sets the filaments or fibers as they emerge from the spinnerette. Thereafter, the fibers are collected for subsequent processing. The fibers, during the collection process, are usually stretched to orient the molecular structure of the fibers; thereafter, the fibers are assembled in "tows", bundles of individual fibers aligned in parallel fashion. Binding agents, coloring, fat and flavor can be added to the fiber tows and the entire fiber mass shaped to resemble familiar meat products. Details regarding the techniques are disclosed, for example, in U.S. Pat. No. 2,682,466, granted June 29, 1954, to Boyer; an U.S. Pat. No. 3,482,998, granted Dec. 9, 1969, to Carroll, et al.

The thermal plastic extrusion method of forming textured protein meat analog products is an adaptation of technology involved in making ready-to-eat cereal food products. The thermal plastic extrusion process involves preparing a mixture of protein material, water, flavor and other ingredients and thereafter feeding the mixture into a cooker extruder wherein it is subjected to heat and pressure and subsequently extruding the mixture. The extrudate filament as it enters into a medium of reduced pressure (usually atmospheric) expands to form a fibrous cellular structure. On rehydration, the fibrous filamentary texturized protein product can possess an appearance, a bite and mouth feel comparable to cooked hamburger. Details regarding thermal plastic extrusion techniques for the forming of textured protein meat analogs are disclosed, for example, in U.S. Pat. No. 3,488,770, granted Jan. 6, 1970, to Atkinson; and U.S. Pat. No. 3,496,858, granted Feb. 24, 1970, to Jenkins. With the use of suitable binders, product similar to hamburger patties, meat balls, meat loaves and meat chunks can be formed. A variety of other processes are known for providing very suitable texturized proteins which approach the texture and appearance of the textured protein of natural meats.

Textured proteins are generally obtained in the form of particles, for example, fiber pieces, fibrous extrudate filaments, or granules. These particles must be bound together to form shaped meat analog products, for example, beef chunk analogs, chicken analogs, hamburger patty analogs and meat loaf analogs. To hold these particles together, a suitable binder is required. To be acceptable, a suitable binder must have at least the following characteristics. It must present a resonably bland or meat-compatible taste. It must bind effectively. It must heat-set under mild conditions which will not adversely affect the protein particles. It must provide a product with an acceptable meat-like texture and mouthfeel when heat-set.

Heretofore, the really suitable binding materials for meat analog products and natural extended meat products such as meat loaves and croquettes have involved the use of egg white. Egg white can be an excellent binding material, but the supply of egg white is limited and the cost is high. Attempts have been made heretofore to replace a portion of the egg white as the binding material in meat analog products. For example, U.S. Pat. No. 3,343,963, granted Sept. 26, 1967, to Kjelson discloses a three component binder system comprising albumen, gluten and particulate defatted oilseed material; and U.S. Pat. No. 3,594,192, granted July 20, 1971, to Mullen, et al., discloses a binder comprising egg white and a modified soy protein.

These binders, however, still require the presence of egg white. A preferred binder would be one derived from an abundant available vegetable source. The prior art does not disclose, however, vegetable materials known to function as really suitable binders for textured protein foods.

Soybean protein is a material which is in abundant supply. Heretofore, 7S soybean protein was a known material, and methods for isolating this material were known. (See, for example, Koshiyama, "Purification of the 7S Component of Soybean Proteins", Agricultural and Biological Chemistry, Vol. 29, No. 9, pp. 885–887 [1965].)

SUMMARY OF THE INVENTION

In summary, it has been found that 7S soybean protein isolate solubilized in water is an excellent binder for textured protein food products. More particularly, this invention provides a process for forming shaped textured protein food products comprising (1) coating particulate textured protein material with a binder comprising from about 10 to 70%, by weight of 7S soybean protein isolate, and from about 30 to 90%, by weight, water; (2) shaping the coated particulate material into a unitary shaped product; and (3) heating the shaped product to heat-set the binder. In another aspect, this invention provides the novel protein food products formed by this process.

DETAILED DESCRIPTION OF THE INVENTION AND ITS PREFERRED EMBODIMENTS

This invention provides new shaped textured protein food products formed by a process comprising the steps of (1) coating particulate textured protein material with a binder comprising from about 10 to 70%, by weight, of 7S soybean protein isolate, and from about 30 to 90%, by weight, water; (2) shaping the coated particulate material into a unitary shaped product; and (3) heating the shaped product to heat-set the binder.

The product of this process is a novel shaped protein food product comprising particulate textured protein particles bound together by heat-set 7S soybean pro-