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(54) OLEAGINOUS FIBROUS SIMULATED FOOD PRODUCT

(71) We, KAY CANTRELL KITCHENS, LTD., a corporation organised under the laws of the State of Wisconsin, United States of America, of 73–925 Highway 111, Palm Desert, California, United States of America,

do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed to be particularly described in and by the following statement:-

This invention relates to an oleaginous fibrous simulated food product and to a process for preparing it.

There is an obvious and long-felt need in the United States and other developed nations of the world for foods which will satisfy a consumer's hunger but which have highly reduced caloric content and which have very low or no saturated fat and cholesterol. The high incidence of overweight among the populations of western countries is indicative of the overuse of high caloric content foods in these countries. Moreover, many of the ailments which afflict people living in the more advanced countries have been related by researchers to the "modern" diets consumed by the people in these countries. One well known example of a disease which has been related to diet is coronary arteriosclerosis, commonly considered to be partially due to the intake of excessive cholesterol and saturated fat. However, there has been growing evidence that modern diets which contain little or no dietary fiber may contribute to a variety of major and minor ailments, including constipation and colon cancer, and also possibly to a lesser extent, obesity, varicose veins, diverticulosis, and heart disease. The natural undigestible fiber or roughage contained in natural foods consists primarily of cellulose, hemicellulose, lignins, pectins, and small traces of other substances, with cellulose being the major constituent. These natural fibers are virtually undigestible but are becoming generally recognized as an essential component of proper nutrition, with suggested daily dietary fiber requirements being in the range of 20–40 gms. or more.

Because of the great desirability of increasing the fiber content of foodstuffs, both to decrease caloric content and to obtain the beneficial properties of fiber, attempts have been made to add refined fibrous cellulose to food compositions. Since refined fibrous cellulose is similar in feel and appearance to flour, this type of cellulose has been used as a bulking agent in farinaceous foods such as breads, pastas and other flour based products. The percentage of the fibrous cellulose versus other food components which can be used in such farinaceous foods has been limited if a product having a desirable texture and body is to be obtained. Moreover, previous food products containing fibrous cellulose have been found somewhat objectionable because of the mouth feel of the cellulose particles.

Soluble cellulose derivatives such as cellulose ether and gums and cellulose crystallite aggregates have been added to food products and are widely used as stabilizers and texture enhancers for natural food materials. However, the use of these cellulose derivatives has been limited to only very small percentages in relation to the weight of the overall food product, in the range of 1–2% or less, and attempts to use such cellulose derivatives as bulking agents in substantial quantities have been generally unsuccessful because of the unpalatability of the resulting product.

It is apparent that the primary requisite of a fiber enhanced natural or simulated food is palatability to the consumer, with the simulated food preferably being as close as possible in taste and texture to a common natural food.

We have now devised an oleaginous fibrous food base composition for simulated food products, which composition contains large amounts of cellulosic fibers, but is nonetheless palatable to the consumer. The high concentration of fibrous cellulose supplements the necessary ration of such fibers in a well balanced

diet, and the cellulose is provided in a form which can simultate natural food products and thus be readily acceptable to the consumer. Such products are low in calories because of the high proportion of cellulose fibers in relation to digestible food material, and because of the substantial water absorption capabilities of cellulose fiber, thus allowing substantial satiation of appetite without the intake of excess and unneeded calories.

According to the invention, there is provided an oleaginous fibrous food base composition for simulated food products comprising:

(a) a binding mixture of edible oil and edible gum (as herein defined) in water; and

(b) at least 10% on a dry weight basis of particulate fibrous cellulose uniformly intermixed within the binding mixture.

The invention also provides a process for producing an oleaginous fibrous food composition for simulated food products comprising:

(a) mixing at least one edible gum (as herein defined) with water at a mixing speed and temperature sufficient to maintain the gum in suspension without lumping;

(b) mixing an edible oil with at least one emulsifier at a temperature sufficient to completely melt the oil and emulsifier mass;

(c) thoroughly mixing the oil and emulsifier mass with the edible gum and water suspension to produce a binding mixture; and

(d) thoroughly mixing particulate fibrous cellulose into the binding mixture to uniformly distribute the fibrous cellulose particles throughout the entire mass of the binding mixture in an amount, on a dry weight basis, of at least 10%.

Preferably, prior to the addition of particulate fibrous cellulose to the binding mixture, the binding mixture is subjected to additional treatment comprising:

(a) heating the binding mixture to a temperature of at least 120 °F., and

(b) passing the binding mixture through a homogenizer to stabilize the suspension of gum and oil within the mass of the binding mixture.

By "edible gum" we mean an edible hydrocolloid which, in water, will form a viscous solution or dispersion.

The compositions of the invention comprise separated fibrous cellulose particles uniformly intermixed within a binding mixture. The binding mixture is formed as a mixture of a colloidal suspension of an edible oil and an edible gum in water. The binding mixture provides a viscous matrix in which the cellulose particles are dispersed and supported. This oleaginous base may be varied such that the product is in the form of a heavy liquid, a spreadable solid, a semi-solid or a foamed product in which gases are introduced into the product. This base material is a smooth textured and bland flavored base, with the flavor and texture of the final product being primarily determined by flavor additives and texturizers that are added to the base material. For example, the base product may have flavoring, coloring and texturizing ingredients added thereto to simulate margarine, cheese spread, peanut butter, meat, fish and poultry spreads. Other products which can be simulated with the incorporation of flavor and texturizers with the base product include coffee creamers, ice cream, candies, whipped creams, pastry frostings, cream soups, mayonnaise, salad dressings, puddings, soups, simulated meat products, fruit sauces and dips.

The compositions of the invention comprise, as an essential ingredient, one or more edible gums. Some (but not all) edible gums will also function as gelling agents, that is to say that when they are present in the compositions in an appropriate amount, they will set to provide a cohesive structural network gel in which the cellulose particles are dispersed and supported. The compositions of the invention may comprise one or more such gelling agents, optionally together with one or more non-gelling edible gums as desired.

Colored and flavored portions of the gelled base product can be interspersed with or dispersed in a carrier of base product which is colored and flavored differently, thus allowing simulation of such foods as salami, as well as meats having traces of interlaced fat. The base product may have flavoring, coloring and texturizing ingredients added thereto to simulate loaf cheese and sliceable meat products.

Although it is desirable to eliminate or minimize the saturated fat and cholesterol in the food products of the invention, it is possible to utilize animal fats such as butter fats in liquified form as the oil in the base product of the invention, with the resulting product closely simulating natural milk derived products, but because of the bulk of the cellulose fiber, having fewer calories per gram and obtaining the benefits of cellulose fiber in nutrition.

Desirably, a cellulose fiber fortified simulated food composition will have many of the attributes of natural foods in order to be attractive to the consumer, and in its base form will not contribute substantially to the usable caloric intake. Such simulated food compositions must not only be palatable to persons who will consume them, but also must be physiologically compatible with the human digestive system.

It has been determined that the cellulosic fibers contained in natural foods contribute very little, if any, available caloric value to humans, and it is generally assumed that humans are not capable of providing the enzymes and other digestive juices required to digest cellulose. However, since virtually all plant matter consumed by humans contains some cellulose, it is apparent that most naturally occurring cellulosic materials are not harmful to the human digestive tract. In fact, the "roughage"

or bulk provided by the cellulosic materials and other indigestible materials is often necessary for proper human digestion. As discussed above, there is substantial evidence to suggest that non-nutritive fiber material is valuable in the human digestive process in minimizing the impact of various functional diseases such as cancer, heart disease, varicose veins, and diabetes.

We have found that fibrous cellulose obtained from such natural materials as wood, cotton, grains, vegetable material and so forth may, under proper conditions and with proper treatment, be utilized as a major non-nutritive component of food substitutes and as a hygienic dietary additive to standard food products. This cellulose should preferably be in the form of separated cellulosic fibers, with substantially all of the binding material between the fibers, such as lignin and pectin, removed in order to provide a bland material which will not contribute substantially to the flavor of the final product. An example of a satisfactory cellulose fiber is wood pulp which has been digested by either the well-known sulphate or sulphite process to remove the binders, although similar fiber obtained by other processes is also satisfactory. The resulting cellulose fiber may be washed and cleansed to remove any traces of extraneous chemicals, and then mechanically ground to reduce the fibers down to sufficiently small size to provide adequate palatability. We have found that a cellulose particle size which averages 20 to 40 microns or less in length provides satisfactory palatability and mouth feel to a majority of human subjects. Average particle sizes greater than about 40 microns in length results in a product having a "gritty" mouth feel, which is unacceptable to most consumers.

One type of particulate fibrous cellulose satisfactory for use in our food product is obtained from the Brown Company of Berlin, New Hampshire, under the name Solka-Floc BW-300. (Solka-Floc is a trade mark.) Such particulate fibrous cellulose, also known as powdered cellulose, is a mechanically disintegrated and purified cellulose generally obtained from primarily alpha cellulose derived from wood pulp. 99.5% of this material will pass through a 33 micron screen and 99.0% will pass through a 23 micron screen. The average fiber length is 21 microns and the average fiber width is 17 microns. The most satisfactory palatability of the food products of the invention is obtained with relatively fine powdered cellulose such as Solka-Floc BW-300, or any equivalent powdered cellulose, because the relatively small particle size of the cellulose fibers minimizes the gritty mouth feel of the insoluble cellulose, and also allows the cellulose fibers to be easily distributed within a water-gum-oil suspension matrix.

The base product of the invention consists essentially of at least 10%, on a dry weight basis of separated fibrous cellulose particles, an edible oil such as vegetable oil, and an edible gum binder or mucilage, with the gum and oil both being placed in colloidal suspension in water to form a binding mixture which, upon addition and thorough dispersion of particulate fibrous cellulose, will hold the cellulose fibers in suspension. Various flavorings, colorings and other additives may be added in order to obtain a food substitute product which simulates a natural food. The end product may be in the form of a liquid, a spreadable solid, a semi-solid or a foamed product in which air or other gases are introduced into the product to cause it to froth.

The base product may also comprise separated fibrous cellulose particles, an edible oil such as vegetable oil, and one or more edible gums at least one of which will function as a cohesive gelling agent, with the gums and oil both being placed in colloidal suspension in water to form a binding mixture which, upon addition and thorough dispersion of particulate fibrous cellulose, will hold the cellulose fibers in suspension in an infinite structural network upon setting up of the gel. These mixed ingredients may also be heated and maintained at a high temperature to pasteurize the composition in accordance with customary pasteurization procedures. For example, we have determined that satisfactory pasteurization is obtained if the composition before gelling is maintained at 160 °F. for 30 minutes. The composition may then be cooled, and maintained under conditions which will induce the particular gelling agent or agents chosen to set, for a period of time sufficient for the composition to attain a continuous cohesive gel structure.

It may be noted that the caloric content of the overall resulting food substitute product is contributed almost entirely by the organic substances other than the cellulose fiber particles, and the nature of this caloric content can be controlled, for example, to exclude substantially all saturated fat and cholesterol.

The overall cellulose fiber content of the final product on a "dry weight basis" (meaning as a percentage of all ingredients of my base compositions other than water) is at least 10% and preferably not more than 85% to allow for sufficient binding mixture and flavor, color, texture and other additives to permit simulation of natural foods. The edible oil content on a dry basis is preferably at least 5% to provide a significant oleaginous character to the composition, the minimum oil content of the following Examples being about 14% on a dry basis (Example XI), and may be as great as 60% where it is desired to simulate certain high fat natural foods such as cheese or sausage. Of course, where it is desired to have a simulated food of very low caloric content, the oil content will normally be less than about 30%. The gum content is normally provided by a combination of gums selected for their specific known

properties, in total amounts of from 0.1% to 5% to provide the desired viscosity within the binding mixture as well as palatability. Some of the edible gums which are also cohesive gelling agents need to be used in amounts greater than 5% if satisfactory gelling is to be obtained. In general, the amount of cohesive gelling agent gum (when such a gum is used) will be from 1 to 50%. The water component of the composition will normally be sufficient to provide at least 40% water in the final simulated food product, and may be much greater as in simulated soups and milk products.

The following Examples are provided as illustrative of the product and process of this invention, but it is understood that the invention is not limited to the specific details thereof. In the following description, the words "Hobart", "Hercules", "Tween", "Sorbistat", "Norda", "Firmenich", "Durkee's", "Wessanen" and "Miratex" are used, these words being trade marks.

EXAMPLE I

One kilogram of a low calorie oleaginous fibrous food base composition was prepared having the ingredients listed below.

Ingredient	Amount
Water	626 gm.
Locust Bean Gum	5.1 gm.
Guar Gum	5.1 gm.
Carrageenan	1.62 gm.
Corn Oil	79.3 gm.
Polyoxyethylene (20) Sorbitan Monostearate (Polysorbate 60)	0.4 gm.
Separated and Purified Cellulose Fibers (Brown Company Solka-Floc BW-300)	282.48 gm.

A first hydrocolloid or gum mucilage mixture was prepared by adding the 5.1 gm. of locust bean gum in-stream fashion to 192.4 gm. of water at 175 °F. in a Waring high shear type blendor and mixed for a period of three minutes. The resulting mucilage mixture was slowly stirred at a temperature of 175 °F. for 10 minutes.

The 5.1 gm. of guar gum was added in-stream fashion to 259.26 gm. of water at 100 °F. in a Waring blendor set at first speed to create a vortex and mixed for a period of three minutes. This gum mucilage mixture was held at 100 °F. while awaiting further processing.

The 1.62 gm. of carrageenan was added in-stream fashion to 173.93 gm. of water at 70 °F. in a Waring blendor, and mixed for a period of three minutes. The other gum mixtures listed above were then added to the carrageenan mixture, and the total was mixed together at high speed for two minutes. As in all examples herein, the gum mixtures were mixed at sufficient speed and temperature to prevent lumping of the gums within the mixture.

The corn oil was heated to 130 °F. and mixed with the polysorbate 60 and was then added in and thoroughly mixed together with the gum mixture. The finely divided purified cellulose fibers were then placed in the bowl of a Hobart mixer, and the other materials listed above were added and mixed in with the cellulose fibers with the mixer set at top speed for approximately five minutes. Use of polysorbate 60 or other emulsifier is preferred in order to obtain a stable oil in water emulsion.

The resulting product was substantially odorless, had a grayish-white color, and a bland taste. The texture of this food base composition was smooth and easily masticated. The product had a slippery mouth feel characteristic of other oleaginous products such as margarine, but did not leave the feeling of residual "grease" or oil in the mouth after the product was swallowed. The cellulose fiber comprised 75.7% of the non-water components of the base composition, and the hydrocolloids and the oil comprised 3.15% and 21.15%, respectively, of the non-water base components.

Liquid flavorings and colorings were easily added and intermixed with the oleaginous fibrous food base composition to provide a product that simulated the flavor and color of margarine, cheese spread, and other smooth textured oleaginous materials such as cheese dip and salad dressing.

EXAMPLE II

A low caloric content oleaginous fibrous imitation cheese spread was prepared having the following components.

Gum mucilage mixtures were first prepared independently. The 19.2 gm. of locust bean gum was added in-stream fashion to 770 ml. of water at 175 °F. and mixed in a Waring type blendor for 3 minutes. The resulting gum mucilage mix was stirred at 175 °F. for 10 minutes. The 38.4 gm. of guar gum was added in-stream fashion to 960 ml. of water at 100 °F. in a Waring blendor and was mixed for a period of 3 minutes. The resulting mucilage mixture was held at 100 °F. The 1.2 gm. of carboxy methyl cellulose was added in-stream fashion to 400.0 ml. of water at 70 °F. in a Waring blendor and mixed for a period of 3 minutes. The resulting mixture was kept at room temperature (70 °F.). The 144.0 gm. of gum acacia was added in-stream fashion to 600 ml. of water at 175 °F. in a Waring blendor, and mixed for a period of three minutes. The resulting mixture was maintained at 175 °F.

The 360.0 gm. of corn oil and the 19.5 gm. of polyoxyethylene (20) sorbitan monostearate were heated and mixed together at 130 °F. The remaining ingredients listed above other than the cellulose fibers were added to

Ingredient	Amount	Percent by Weight
Water	2730 ml. (approx. 2730 gm.)	55.76
Locust Bean Gum	19.2 gm.	0.39
Guar Gum (Cesalpinia)	38.4 gm.	0.78
Carboxy Methyl-Cellulose (7 HF-Hercules	1.2 gm.	0.02
Gum Acacia	144.0 gm.	2.94
Corn Oil	360.0 gm.	7.35
Polyoxyethylene (20) Sorbitan Monostearate (Tween 60--Atlas ICI America)	19.5 gm.	0.40
Sorbitol 70% Solution	182.4 gm.	3.73
Sodium Chloride	115.2 gm.	2.35
Potassium Sorbate (Sorbistat K)	3.84 gm.	0.08
Sodium Benzoate	1.905 gm.	0.04
Citric Acid, Hydrous	6.00 gm.	0.12
Yellow Color Number 5, 10% Solution	1.0 ml. (approx. 1 gm.)	0.02
Yellow Color Number 6, 10% Solution	3.35 ml. (approx. 3.35 gm.)	0.07
Artificial Milk #Y-938 (Norda)	1.5 ml. (approx. 1.5 gm.)	0.03
Mustard, Double Fine	2.1 gm.	0.04
Onion Powder	71.4 gm.	1.46
Worcestershire Sauce	4.0 gm. (approx. 4.0 gm.)	0.08
Monosodium Glutamate	3.0 gm.	0.06
Imitation Cheddar Cheese #19517 (Stange)	3.0 ml. (approx. 3.0 gm.)	0.06
Separated and Purified Cellulose Fibers (Brown Company Solka-Floc BW-300)	1,185.0 gm.	24.20
Total	4,896 gm.	100%

the gum acacia mucilage mixture and mixed in the Waring blendor at a high speed for three minutes.

All of the above ingredients other than the cellulose fibers were then added together in the bowl of a 30 quart Hobart mixer and were beaten together with a wire basket whip at top speed for approximately 3 to 5 minutes. The 1,185.0 gm. of cellulose fiber particles were then added in a steady fashion, with the Hobart mixer operating at low speed. After all of the cellulose fiber particles had been added, the Hobart mixer was turned to top speed and the mixture was beaten together for a period of five minutes.

The resulting 4896 grams of oleaginous fibrous imitation cheese product had a pH of 4.4 and a distinctive cheddar flavor and a natural easily spread cheese-like consistency. The cellulose fiber particulate material comprised approximately 55% of the weight of the finished product excluding water, approximately 24% of the overall weight of the finished product including water. The cellulose fiber comprised approximately 68% of the non-water base ingredients, with hydrocolloids comprising 11.6% and the corn oil comprising 20.6% respectively of the non-water base ingredients.

EXAMPLE III

A low caloric content oleaginous fibrous

imitation margarine was prepared having the following composition.

Gum mucilage mixtures were first prepared. The 27.0 gm. of locust bean gum was added in-stream fashion to 770 ml. of water at 175°F. and was mixed in a Waring blendor for a period of 3 minutes. The resulting mucilage mixture was then stirred at a temperature of 175° F. for 10 minutes.

The 38.4 gm. of guar gum was added in-stream fashion to 1,060 ml. of water at 100° F. in a Waring blendor for a period of 3 minutes. The resulting mucilage mixture was held at 100° F.

The 144.0 gm. of gum acacia was added in-stream fashion to 1,000 ml. of water at 170° F. in a Waring blendor and was mixed for a period of three minutes. After the gum acacia mucilage mixture was prepared, the Sorbitol 70% Solution, the salt, the potassium sorbate, the sodium benzoate, and the citric acid were added thereto and mixed at high speed for three minutes.

In a separate Waring type blendor, the polyoxyethylene (20) sorbitan monostearate, the corn oil, the beta-carotene, and the artificial butter flavor were heated and mixed together at 130°F.

All of the above mixtures of ingredients were added together in the bowl of a 30 quart Hobart mixer, and were vigorously mixed together with a wire basket whip at top speed for approximately 3–5 minutes. After this period of mixing, the cellulose fiber particulate was slowly added to the mixture, with the mixer operating at slow speed. The Hobart mixer was then switched to top speed and the total mass mixed together for a period of five minutes. The resulting 4912 grams of oleaginous fibrous simulated margarine product had a butter-like flavor, color, and consistency and a final density of approximately 1.15 specific gravity with a pH of 4.35 to 4.4. The cellulose fibrer particulate comprised approximately 57% of the weight of the constituents of the imitation margarine product excluding water, and approximately 24% of the total weight of the product including water. The fibrous cellulose comprised 67.5% and the hydrocolloids and the oil comprised respectively 11.9% and 20.5% of the non-water base ingredients.

EXAMPLE IV

One kilogram of low caloric content oleaginous fibrous imitation margarine was prepared have the ingredients listed on Page 7.

178.77 gm. of water at a temperature of 175°F. was placed in a Waring blendor turned onto its first speed to move the water in a vortex. 4.75 gm. of locust bean gum was then

Ingredient	Amount	Percent by Weight
Water	2830 ml. (approx. 2830 gm.)	57.61
Locust Bean Gum	27.0 gm.	0.55
Guar Gum	38.4 gm.	0.78
Gum Acacia	144.0 gm.	2.93
Sorbitol 70% Solution	182.4 gm.	3.71
Sodium Chloride	115.2 gm.	2.35
Potassium Sorbate (Sorbistat K)	3.84 gm.	0.08
Sodium Benzoate, Powder	1.905 gm.	0.04
Citric Acid, Hydrous	3.0 gm.	0.06
Polyoxyethylene (20) Sorbitan Monostearate	19.5 gm.	0.40
Corn Oil	360.0 gm.	7.33
Beta-Carotene, 24% (400,000 Vit. A. units/gram)	0.225 gm.	0.005
Artificial Butter Flavor 57.390/A-(Firmenich)	1.5 ml (approx. 1.5 gm.)	0.03
Separated and Purified Cellulose Fibers (Brown Company Solka-Floc BW-300)	1,185.0 gm.	24.12
Total	4,912 gm.	100%

Ingredient	Amount	Calories Per Gram	Total Calories
Water	581.32 gm.	0	0
Locust Bean Gum	4.75 gm.	4.0	19.0
Guar Gum	4.75 gm.	4.0	19.0
Carrageenan	0.95 gm.	4.0	3.8
Sorbitol 70% Solution	41.0 gm.	2.8	114.8
Salt (Sodium Chloride), Iodized	23.5 gm.	0	0
Potassium Sorbate (Sorbistat K)	0.85 gm.	0	0
Sodium Benzoate	0.42 gm.	0	0
Citric Acid, Hydrous	0.6 gm.	4.0	2.4
Monosodium Glutamate	0.6 gm.	0	0
Corn Oil	73.7 gm.	9.0	663.3
Tween 60 (Polyoxyethylene (20) Sorbitan Monostearate)	3.5 gm.	9.0	31.5
Beta--Carotene 24%	0.060 gm.	9.0	0.54
Margarine Flavor 57.390/A--Firmenich	0.3 ml.	4.0	1.2
Separated and Purified Cellulose Fibers (Brown Company Solka-Floc BW-300)	263.7 gm.	0	0
	1000.0 gm.		855.54 Cal.

added to the water in-stream fashion and mixed in for three minutes. This gum solution was held at 175°F. while awaiting further processing.

A second gum mucilage was prepared by placing 240.90 gm. of water at a temperature of 100°F. in a Waring blendor, creating a vortex in the water and adding 4.75 gm. of guar gum--THI in-stream fashion to the water and mixing for three minutes. This gum mixture was held at 100°F. while awaiting further processing.

A third gum mucilage was made by placing 161.65 gm. of water at 70°F. into a Waring blendor, creating a vortex in the water, and adding in-stream fashion 0.95 gm. of carrageenan and mixing for three minutes. The other gum mucilage mixtures listed above were then added in, and the total mixture was mixed together at high speed for two minutes. The corn oil, Tween 60, beta--carotene, and margarine flavor were heated to 130°F. and mixed together, and then added with all of the other ingredients listed above to the gum mucilages and the total mixed together for three minutes.

The 263.7 gm. of cellulose fibers was placed in the bowl of a Hobart mixer, and the previously mixed materials were added and mixed in with the cellulose fibers at top speed for approximately five minutes.

The resulting one kilogram of oleaginous simulated margarine product had a margarine color and flavor with a final density of approximately 1.15 specific gravity, a pH of between 4.0 and 4.5, and a calorie value of 0.856 calorie per gram. Regular margarine averages a caloric value of approximately 7.2 calories per gram. The cellulose fiber particulate comprised approximately 63% of the weight of all the constituents excluding water, and approximately 26.4% of the total product including water. The fibrous cellulose comprised 75.8% and the hydrocolloids and the oil comprised respectively 3% and 21.2% of the non-water base ingredients.

The oleaginous fibrous simulated margarine product of Example IV was converted to a simulated salad dressing or mayonnaise consistency by the further addition and intermixing of 443.72 gm. of water, resulting in a product having 71% water content. Still further addition and intermixing of 924.97 gm. of water reduced the consistency to that of a cream soup. The soup consistency product had a water content of 82.32%. It is apparent that flavor adjustments may be made as necessary to produce a desired product that closely simulates the flavor of salad dressings and soups that consumers are accustomed to

EXAMPLE V

One hundred grams of low calorie content oleaginous fibrous imitation margarine was prepared having the ingredients listed above in Example IV, and in the same proportions as are listed in Example IV, except that the fibrous cellulose utilized was prepared in the manner as specified below.

Two batches of fibrous cellulose derived from wood pulp (Solka-Floc BW-300) of 18 grams per batch were each placed in the thimble of a standard Soxhlet fat-extraction apparatus, and 200 milliliters (mls.) of a solvent mixture consisting of 50 mls. of methanol and 150 mls. of benzene was poured on the 18 grams of fibrous cellulose in the thimble. Refluxing was started, and the heat mantle of the Soxhlet apparatus was adjusted to give an even evaporation--condensation operation. Refluxing was continued under these conditions for a period of two

Ingredients	Amount	Calories Per Gram	Total Calories
Water	563.88 gm.	0	0
Locust Bean Gum	4.75 gm.	4.0	19.0
Guar Gum	4.75 gm.	4.0	19.0
Carrageenan	0.95 gm.	4.0	3.8
Sorbitol 70% Solution	41.0 gm.	2.8	114.8
Salt (Sodium Chloride)	23.5 gm.	0	0
Potassium Sorbate (Sorbistat K)	0.85 gm.	0	0
Sodium Benzoate	0.42 gm.	0	0
Citric Acid, Hydrous	1.20 gm.	4.0	4.8
Yellow Color, No. 5, 10% Solution	2.2 gm.	0	0
Yellow Color, No. 6, 10% Solution	0.70 gm.	0	0
Artificial Milk Flavor No. Y-938	0.3 gm.	4.0	1.2
Mustard, Double Fine	0.42 gm.	4.0	1.68
Onion Powder	14.20 gm.	3.5	49.7
Worcestershire Sauce	0.78 gm.	0	3.12
Monosodium Glutamate	0.60 gm.	0	0
Imitation Cheddar Cheese No. 19517 (Stange)	0.60 gm.	4.0	2.4
Corn Oil	73.7 gm.	9.0	663.3
Tween 60 (Polyoxyethylene (20) Sorbitan Monostearate)	3.5 gm.	9.0	31.5
Separated and Purified Cellulose Fibers (Brown Company Solka-Floc BW-300)	263.7 gm.	0	0
	1000.0 gm.		914.3 Cal.

hours, and then stopped.

The thimble containing the fibrous cellulose was removed, and the excess solvent mixture was drained off. The residual solvent drenched fibrous cellulose was then mixed with 100 mls. of water, and the fibrous cellulose--water suspension was then poured out onto a flat tray and dried at a temperature between 140° and 160°F.

26.37 gm. of the residual dried fibrous cellulose powder from the two batches of solvent extracted cellulose was then utilized to produce a simulated margarine sample having the ingredients and the proportions listed above in Example IV, except that only 100 gm. of margarine product was obtained. The resulting simulated margarine product had a density, a pH, and other physical properties which were identical to the margarine product as described in Example IV. The solvent extracted fibrous cellulose may be used in extremely bland flavored products such as lightly flavored margarine, whipped cream, and coffee creamer type products where a slight woody flavor present in some wood pulp derived cellulose may be detected. The slight woody flavor present in some untreated wood pulp derived fibrous cellulose is due in part to the resins, pectins, pitches, fats and oils in the wood pulp. These substances are soluble in and are extracted by the solvents used in the extraction procedure, with the solvent extracted cellulose fiber having the non-cellulose constituents substantially removed. However, any wood flavor overtones which might be present in untreated fibrous cellulose is rendered substantially undetectable by the stronger flavors used in such simulated products as cheese spreads and meat spreads.

Other solvent extraction methods may be utilized with similar success, including the use of such alternative solvents as ether, straight ethanol or straight methanol, trichloroethylene, dichloromethane, and chloroform.

EXAMPLE VI

One kilogram of a second oleaginous fibrous imitation cheese spread was prepared in the manner and having the constituents as described in table on page 8.

178.77 gm. of water at a temperature of 175°F. was placed in a Waring blendor set at first speed to create a vortex in the water. 4.75 gm. of locust bean gum was added in-stream fashion and mixed in with the water for a period of three minutes. This mucilage mixture was stirred and held at a temperature of 175°F.

223.46 gm. of water at a temperature of 100°F. was placed in a Waring blendor at first speed to create a vortex therein. 4.75 gm. of guar gum was added in-stream fashion to the water and mixed for three minutes. The resulting gum mucilage was held at 100°F.

161.65 gm. of water at a temperature of 70°F. was placed in a Waring blendor set at first speed to create a vortex, and 0.95 gm. of carrageenan was added in-stream fashion and mixed for a period of three minutes. The other gum solutions listed above were then added together to the carrageenan gum mixture, and the resulting mucilage combination was mixed at high speed for two minutes.

The corn oil and the Tween 60 were heated to 130°F. and mixed together, and then added with all of the above listed ingredients except the cellulose fiber to the gum mucilage mixture. The combination of ingredients was mixed at high speed for three minutes.

The 263.7 gm. of cellulose fibers were placed in the bowl of a Hobart mixer, and the above described mixture of ingredients was added together to the fibrous cellulose and mixed in for a period of five minutes at high speed.

The resulting product had a final density of approximately 1.15 specific gravity, a pH between 4.1 and 4.2, and had a texture which was easily spreadable. The total of the above ingredients resulted in one kilogram of simulated cheese spread, with cellulose fiber comprising 60.5% of the weight of the product excluding water, and 26.4% of the total product including water. The fibrous cellulose comprised 75.8% and the hydrocolloids and the oil comprised respectively 3% and 21.2% of the non-water base ingredients. The simulated cheese spread had a caloric value of 0.914 calorie per gram compared to an average caloric value of 2.88 calories per gram for regular cheese spreads.

EXAMPLE VII

One kilogram of a low caloric content oleaginous fibrous imitation cheese dip was prepared having the following ingredients.

Ingredient	Amount
Water	673.88 gm.
Locust Bean Gum	4.35 gm.
Guar Gum	4.35 gm.
Carrageenan	0.85 gm.
Sorbitol 70% Solution	41.0 gm.
Salt (Sodium Chloride)	23.5 gm.
Potassium Sorbate (Sorbistat K)	0.85 gm.
Sodium Benzoate	0.42 gm.
Citric Acid, Hydrous	1.2 gm.
Yellow Color No. 5, 10% Solution	0.2 gm.
Yellow Color No. 6, 10% Solution	0.7 gm.
Artificial Milk Flavor	0.3 gm.
Mustard, Double Fine	0.42 gm.
Onion Powder	14.2 gm.
Worcestershire Sauce	0.78 gm.
Imitation Cheddar Cheese Flavor	0.6 gm.
Corn Oil	54.0 gm.
Polyoxyethylene (20) Sorbitan Monostearate (Tween 60--Atlas	

Ingredient	Amount
ICI America)	3.0 gm.
Separated and Purified Cellulose Fibers (Brown Company Solka-Floc BW-300)	175.4 gm.

A gum mucilage was prepared by adding the 4.35 gm. of locust bean gum in-stream fashion to 218.77 gm. of water at 175°F. in a Waring blendor and mixing for a period of three minutes. This mucilage was stirred at a temperature of 175°F. for ten minutes.

A second gum mucilage was prepared by adding 4.35 gm. of guar gum in-stream fashion to 263.46 gm. of water at 100°F. in a Waring blendor set at its first speed. The mucilage was mixed for three minutes and then held at 100°F. to await further processing.

The 0.85 gm. of carrageenan was added in-stream fashion to 191.65 gm. of water at 120°F. in a Waring blendor set on first speed. This carrageenan mucilage was mixed for three minutes, and the locust bean gum and guar gum mucilages as prepared above were then added thereto and mixed in at the first speed of the blendor for two minutes.

The corn oil and the polyoxyethylene (20) sorbitan monostearate were mixed together and heated to 130°F., and then added to the gum mucilages as prepared above. All of the other ingredients listed above except the cellulose fibers were then added to the gum mucilages and were mixed in at the highest speed of the Waring blendor for three minutes.

The 175.4 gm. of cellulose fibers were placed in a bowl of a Hobart mixer, and the mixture prepared above was added thereto and mixed for five minutes on high speed with a beater.

The resulting oleaginous fibrous simulated cheese product had a cheese-like flavor and a thick fluid consistency. The pH of the product was between 4.1 and 4.2. The fibrous cellulose comprised 53.8% of all non-water components of the final product and 73.4% of the non-water base ingredients. The hydrocolloids and the oil comprised 4% and 22.6% of the base ingredients respectively.

EXAMPLE VIII

One kilogram of low calorie oleaginous fibrous initation ham paste was prepared having the following ingredients.

Ingredient	Amount
Water	601.43 gm.
Locust Bean Gum	4.45 gm.
Guar Gum	4.45 gm.
Carrageenan	0.88 gm.
Sorbitol 70% Solution	38.45 gm.
Salt (Sodium Chloride)	27.5 gm.
Potassium Sorbate (Sorbistat K)	0.78 gm.
Sodium Benzoate	0.4 gm.
Citric Acid, Hydrous	1.0 gm.
Monosodium Glutamate	1.31 gm.
Worcestershire Sauce	1.87 gm.
Total Ham Flavor (Polak's Frutal Works)	5.0 gm.
Red Shade Replacement No. 2, 10% Solution	0.15 gm.
Instant Caramel 602	1.23 gm.
Corn Oil	69.11 gm.
Polyoxyethylene (20) Sorbitan Monostearate (Tween 60--Atlas ICI America)	3.28 gm.
Separated and Purified Cellulose Fibers (Brown Company Solka-Floc BW-300)	238.71 gm.

The first gum mucilage was prepared by adding the 4.45 gm. of locust bean gum in-stream fashion to 167.67 gm. of water at 175°F. in a Waring blendor set on first speed to create a vortex. After mixing for three minutes, the resulting mucilage was held in a hot water bath and slowly stirred at 175°F. for ten minutes.

The 4.45 gm. of guar gum was added in-stream fashion to 282.18 gm. of water at 100°F. in a Waring blendor set on first speed to create a vortex. After mixing for three minutes, the mucilage was held at 100°F. to await further processing.

The 0.88 gm. of carrageenan was added in-stream fashion to 151.58 gm. of water at 120°F. in a Waring blendor set on first speed to create a vortex, and was mixed in for three minutes. The previously mixed gum mucilages were then added into the carrageenan mucilage and were mixed together at high speed for three minutes.

The corn oil and the polyoxyethylene (20) sorbitan monostearate were mixed and gently heated to 130°F. and then added to the previous mixed gum mucilages. All of the other above ingredients except the cellulose fiber were then added to the gum mucilage mixtures in a Waring blendor and mixed together on high speed for three minutes.

The 239.15 gm. of powdered cellulose fiber was placed in the bowl of a Hobart mixer. The above mixed ingredients were added thereto and mixed in on high speed for five minutes with a beater.

The resulting paste-like oleaginous fibrous simulated ham paste had a smooth, very slightly oil texture and a strong ham-like flavor. The pH of the product was betwwen 4.2 and 4.5. The fibrous cellulose comprised 60.0% of all non-water ingredients and 75.19% of all non-water base ingredients. The hydrocolloids and the oil comprised respectively 3.08% and 21.73% of the non-water base ingredients.

EXAMPLE IX

One kilogram of low calorie oleaginous fibrous imitation margarine was prepared having the following ingredients.

Ingredient	Amount
Water	607.74 gm.
Propylene Glycol Alginate	4.5 gm.
Sodium Alginate	1.5 gm.
Carrageenan	0.24 gm.
Sodium Carboxymethylcellulose	4.0 gm.
Corn Oil	110.0 gm.
Lecithin	2.0 gm.
Mono- and Di-glycerides (Durkee EC-187-M)	3.0 gm.
Glycerine	40.0 gm.
Sorbitol (U.S.P. Powder -- Atlas Chemical)	5.3 gm.
Salt (Sodium Chloride)	5.5 gm.
Potassium Chloride	5.5 gm.
Citric Acid, Hydrous	0.5 gm.
Beta--Carotene (24% Solution)	0.2 gm.
Imitation Milk Flavor (Firmenich)	0.015gm.
Imitation Butter Flavor (Firmenich)	0.01 gm.
Separated and Purified Cellulose Fibers (Brown Company Solka-Floc BW-300)	160.0 gm.
Water Repellent (Calcium Stearate) Treated Cellulose Fibers (Brown Company Solka-Floc D-White)	50.0 gm.

The corn oil was heated in a metal bowl to 150°F. and the lecithin and the mono- and di-glycerides were added thereto and the oil stirred until the ingredients were thoroughly mixed.

The water was heated to 130°F. and placed in the bowl of a Waring blendor turned on to create a vortex in the water. The hydrocolloids comprising the propylene glycol alginate, the sodium alginate, the carrageenan, and the sodium carboxymethylcellulose, were added thereto and mixed for three minutes at high speed. The oil and emulsifiers mixture was added to the water and gum mixture, and all of the other ingredients listed above except the cellulose fibers were then added thereto and mixed for three minutes at high speed.

The mixed ingredients were then heated to 160°F. and kept at that temperature for 30 minutes to pasteurize. The mixture was then homogenized in a Manton-Gaulin two stage homogenizer utilizing 2500 to 3500 p.s.i. in the first stage and 500 p.s.i. in the second stage.

The homogenized mixture was then placed in the bowl of a mixer having a dough paddle, and the cellulose fibers were added thereto and mixed in therewith for five minutes.

The product was then adjusted by the addition of acid pH modifying citric acid to a pH of 4.4 and heated to 160°F. for sufficient time to pasteurize.

The resulting oleaginous fibrous simulated margarine product had a margarine color and flavor, and a smooth, margarine texture. The fibrous cellulose (both untreated and water repellent coated) comprised 53.54% of all non-water ingredients and 63.7% of the non-water base ingredients. The hydrocolloids and the oil comprised respectively 3.1% and 33.31% of the non-water base ingredients.

EXAMPLE X

One kilogram of low calorie oleaginous fibrous imitation cheese spread was prepared having the following ingredients.

Ingredient	Amount
Water	603.4 gm.
Sodium Carboxymethylcellulose (CMC 7-HP Hercules)	3.0 gm.
Carrageenan	0.4 gm.
Propylene Glycol Alginate	4.0 gm.
Corn Oil	80.0 gm.
Mono- and Di-glycerides	4.0 gm.
Polyoxyethylene (20) Sorbitan Monostearate (Tween 60)	1.0 gm.
Sorbitol (U.S.P. Powder -- Atlas Chemical)	35.0 gm.
Salt (Sodium Chloride)	11.0 gm.
Potassium Chloride	11.0 gm.
Citric Acid, Hydrous	1.2 gm.
Imitation Cheese Flavor	0.6 gm.
Annato Cheese Color	0.3 gm.
Beta-Carotene (24%)	0.1 gm.
Artificial Cheddar Cheese Flavor Enhancer (Food Material Co.)	5.0 gm.
Separated and Purified Cellulose Fibers (Brown Company Solka-Floc BW-300)	240.0 gm.

The oil was heated to 150°F. and the emulsifiers, consisting of the polyoxyethylene (20) sorbitan monostearate and the mon- and di-glycerides, were added thereto. The mixture was stirred until the emulsifiers were completely melted and thoroughly mixed with the corn oil.

The water was heated to 130°F. and was placed in the bowl of a Waring blendor. The blendor was placed on first speed to create a vortex and the hydrocolloids, consisting of the sodium carboxymethylcellulose, the carrageenan, and the propylene glycol alginate were added

thereto and mixed in for three minutes at high speed. The oil and emulsifier mixture was then added thereto, and all of the other ingredients above listed except the cellulose fibers were added thereto and mixed in for a period of three minutes.

The resulting liquid mixture was heated to 165°F. and kept at that temperature for 30 minutes for pasteurization. After pasteurization, the liquid was passed through a two stage Manton-Gaulin homogenizer having a 2500 to 3500 p.s.i. first stage and a 500 p.s.i second stage.

The homogenized liquid was placed in the bowl of a mixer having a dough paddle, and the cellulose fibers were added in therewith and mixed in for a period of five minutes.

The product was then adjusted by the addition of citric acid to a pH of between 4.2 and 4.5, and pasteurized.

The resulting oleaginous fibrous simulated cheese product had a pH between 4.2 and 4.5, with a cheese-like color and flavor, and a smooth texture. The fibrous cellulose comprised 60.5% of all non-water ingredients and 73.3% of the non-water base ingredients. The hydrocolloids and the oil comprised respectively 2.3% and 24.43% of the non-water base ingredients.

EXAMPLE XI

One kilogram of low calorie imitation cheddar cheese loaf composition having a cohesive structure was prepared having the following ingredients.

A first gum mucilage was prepared by adding the 4.75 gm. of locust bean gum in-stream fashion to 100 gm. of water at 175°F. in a Waring blendor set at first speed to create a vortex. The locust bean gum was mixed for

Ingredient	Amount	Calories Per Gram	Total Calories
Water	503.46 gm.	0.0	0.0
Locust Bean Gum	4.75 gm.	4.0	19.0
Guar Gum	4.75 gm.	4.0	19.0
Carrageenan, Iota Type	0.95 gm.	4.0	3.8
Gelatin, 175° Bloom	60.0 gm.	3.35	201.0
Sorbitol 70% Solution	41.0 gm.	2.8	114.8
Salt (Sodium Chloride)	23.5 gm.	0.0	0.0
Potassium Sorbate (Sorbistat K)	0.85 gm.	0.0	0.0
Sodium Benzoate	0.42 gm.	0.0	0.0
Citric Acid, Hydrous	1.2 gm.	4.0	4.8
Yellow Color No. 5, 10% Solution	0.2 gm.	0.0	0.0
Yellow Color No. 6, 10% Solution	0.7 gm.	0.0	0.0
Artificial Milk Flavor (Norda)	0.3 gm.	4.0	1.2
Mustard, Double Fine	0.42 gm.	4.0	1.68
Worcestershire Sauce	0.78 gm.	4.0	3.12
Imitation Cheddar Cheese Flavor	0.6 gm.	4.0	2.4
Corn Oil	73.7 gm.	9.0	663.30
Polyoxyethylene (20) Sorbitan Monostearate (Tween 60--Atlas ICI America)	3.5 gm.	9.0	31.5
Separated and Purified Cellulose Fibers (Brown Company Solka-Floc BW-300)	278.92 gm.	0.0	0.0
	1000.00 gm.		1065.60 Cal.

three minutes, and the resulting mucilage was held in a hot water bath at 175°F. for ten minutes.

The 4.75 gm. of guar gum was added in-stream fashion to 173.46 gm. of water at 100°F. in a Waring blendor set at first speed to create a vortex. The guar gum was mixed in for three minutes, and the resulting mucilage was held at 100°F. to await further processing.

The 0.95 gm. of carrageenan was added in-stream fashion to 110.0 gm. of water at 120°F. in a Waring blendor set at first speed to create a vortex. After three minutes of mixing, the resulting gum mucilage was held at 120°F.

The 60 gm. of gelatin, a cohesive gelling agent, was added to 120.0 gm. of water at approximately 60°F. in a metal mixing container. This container was then placed in a water bath at 120°F. for one hour to cause the gelatin to dissolve in the water.

The 73.7 gm. of corn oil and the 3.5 gm. of polyoxyethylene (20) sorbitan monostearate were heated and mixed together at approximately 130°F. The above listed gum mucilages were added together and mixed in a Waring blendor for two minutes, and all of the above listed ingredients except the cellulose fibers were added thereto and mixed in on high speed for three minutes.

The cellulose fibers were placed in the bowl of a small Hobart mixer, and the previously mixed ingredients were added therein and mixed for three minutes on high speed with a beater.

The resulting product was placed in a polyethylene sheet liner and then into a block form with a slight amount of pressure applied thereto.

The product was allowed to stand for six hours at room temperature (70°F.) to allow the gelatin to form a cohesive gel structure, and then was cut into small blocks. The chesse loaf product that resulted had a cohesive solid consistency, with a texture and mouth feel similar to that of processed natural cheese. The pH of the cheese loaf was approximately 4.5, with the product having a caloric value of 1.065 calories per gram compared to about 3.7 calories per gram for regular cheese loaf. The cellulose fiber comprised 56.17% of all non-water ingredients, i.e., on a dry weight basis. The non-gelling agent hydrocolloids and the oil comprised respectively 2.1% and 14.84% of the non-water ingredients. The gelatin comprised 6% of the to total weight of all ingredients, including water, and 12.08% of the non-water ingredients.

EXAMPLE XII

One kilogram of low calorie imitation ham loaf was prepared having the following ingredients, (see next page).

A first gum mucilage was prepared by adding the 1.65 gm. of guar gum in-stream fashion to 40.00 gm. of water at 100°F. in a Waring blend blendor set at first speed to create a vortex. The gum was mixed for 3 minutes and held at 100°F. to await further processing.

The 0.65 gm. of carrageenan was added in-stream fashion to 40.00 gm. of water at 120°F. in a Waring blendor set at first speed to create a vortex. After mixing for 3 minutes, the mucilage was held at 120°F.

The 130.0 gm. of gelatin, provided as a gelling agent, was added to 205.0 gm. of water at approximately 60°F. in a mixing container. The mixing container was then placed in a water bath at a temperature of 120°F. for one hour to dissolve or disperse the gelatin in the water.

The 8.2 gm. of sodium alginate was then added in-stream fashion to 270.0 gm. of water at 175°F. in a Waring blendor set at first speed to create a vortex, and mixed for 3 minutes. The 1.0 gm. of sodium hexamethaphosphate was then added in-stream fashion and mixed in for one minute.

The gum mucilages as prepared above were added together in a Waring blendor and mixed for 2 minutes, and the following ingredients were then added to the above mixture and mixed in for 3 minutes.

Sorbitol 70% Solution	25.40 gm.
Salt	28.00 gm.
Potassium Sorbate	0.80 gm.
Sodium Benzoate	0.40 gm.
Monosodium Glutamate	1.50 gm.
Worcestershire Sauce	2.50 gm.
Natural Bacon Flavor	10.00 gm.
Instant Caramel Color	0.35 gm.

The 55.0 gm. of corn oil, the polyoxyethylene (20) sorbitan monostearate, and the smoke flavor were heated to 130°F. and mixed together, and then added to the above mixture, with the total mixed together for 3 minutes in the Waring blendor.

The cellulose fibers were placed in the bowl of a Hobart mixer, and the previously mixed ingredients were added therein and mixed for five minutes on high speed with a beater.

The 0.60 gm. of calcium monophosphate and 3.5 gm. of water were mixed together and added to the above mixture, with all of the above ingredients then being mixed together for one minute. 3.6 gm. of the 50% citric acid solution was added thereto and mixed in with the mass for one minute.

150 gm. of the above mixture was then immediately removed and set out in thin strips on a polyethylene sheet at 70°F. to cool. To the remaining portion of the mixture was added the 0.20 gm. of replacement red shade No. 2, 10% solution and 0.65 gm. of instant caramel color, with the total being mixed to uniformly disperse the color.

A portion of the red colored product in a plastic state was spread thinly into a polyethylene lined baking pan. Several strips of the white colored product was placed on the layer of red product in the baking pan. A second thin layer

Ingredient	Amount	Calories Per Gram	Total Calories
Water	558.50 gm.	0.0	0.0
Guar Gum	1.65 gm.	4.0	6.6
Carrageenan, Iota Type	0.65 gm.	4.0	2.6
Gelatin, 225° Bloom	130.00 gm.	3.35	435.5
Sodium Alginate	8.20 gm.	4.0	32.8
Sodium Hexametaphosphate	1.00 gm.	0.0	0.0
Sorbitol 70% Solution	25.40 gm.	2.8	71.12
Salt (Sodium Chloride)	28.00 gm.	0.0	0.0
Potassium Sorbate (Sorbistat K)	0.80 gm.	0.0	0.0
Sodium Benzoate	0.40 gm.	0.0	0.0
Citric Acid, Hydrous 50% Solution	3.60 gm.	2.0	7.2
Monosodium Glutamate	1.50 gm.	0.0	0.0
Worcestershire Sauce	2.50 gm.	4.0	10.0
Natural Bacon Flavor (NORDA)	10.00 fm.	4.0	40.00
Smoke Flavor (NORDA)	0.20 gm.	4.0	0.8
Instant Caramel Color	1.00 gm.	4.0	4.0
Corn Oil	55.00 gm.	9.0	495.0
Polyoxyethylene (20) Sorbitan Monostearate (Tween 60--Atlas ICI America)	0.80 gm.	9.0	7.2
Calcium Monophosphate	0.60 gm.	0.0	0.0
Replacement Red Shade #2 10% Solution	0.20 gm.	0.0	0.0
Separated and Purified Cellulose Fibers (Brown Company Solka-Floc BW-300)	170.00 gm.	0.0	0.0
	1000.00 gm.		1112.82 Cal.

of plastic red colored product was placed over the white strips, and additional wite strips were then laid over the second layer of red product. This procedure was repeated until a block substantially filling the baking pan was formed. The block was maintained in the pan at room temperature (70°F.) for approximately six hour hours, with a slight amount of pressure being applied to the top of the block during this time.

The resulting simulated ham loaf product had a cohesive solid gel structure, with striations of white product distributed through the greater proportion of red color product to simulate fat in ham. The pH of the simulated ham loaf product was approximately 4.5, with a caloric value of 1.113 calories per gram compared with about 3 calories per gram for ham. The fibrous cellulose comprised 38.5% of the non-water ingredients, the non-gelling agent hydrocolloids comprised 0.52% of the total non-water ingredients and the gelatin and sodium alginate comprised 31.3% of the non-water ingredients.

EXAMPLE XIII

One kilogram of low calorie imitation cocoa candy loaf composition having a solid structure was prepared having the following ingredients (see next page).

A first gum mucilage was prepared by adding the 2.3 gm. of locust bean gum in-stream fashion to 92.7 gm. of water at 170°F. in a Waring blendor set at first speed to create a vortex. The locust bean gum was mixed in for

Ingredient	Amount	Calories Per Gram	Total Calories
Water	466.8 gm.	0.0	0.0
Locust Bean Gum	2.3 gm.	4.0	9.2
Guar Gum	2.3 gm.	4.0	9.2
Carrageenan, Iota Type	0.9 gm.	4.0	3.6
Gelatin 225° Bloom	46.4 gm.	3.35	155.4
Sodium Cyclamate	13.0 gm.	0.0	0.0
Sorbitol 70% Solution	38.0 gm.	2.8	106.4
Salt (Sodium Chloride)	11.0 gm.	0.0	0.0
Potassium Sorbate (Sorbistat K)	0.79 gm.	0.0	0.0
Sodium Benzoate	0.39 gm.	0.0	0.0
Citric Acid, Hydrous	1.1 gm.	4.0	4.4
Artificial Milk Flavor (Norda)	0.4 gm.	4.0	1.6
Artificial Butter Flavor (Firmenich)	0.04 gm.	4.0	0.16
Chocolate Flavor (Monsanto)	0.5 gm.	9.0	4.5
Coca Powder (Wessanen Type N)	56.5 gm.	2.6	146.9
Corn Oil	92.7 gm.	9.0	834.3
Polyoxyethylene (20) Sorbitan Monostearate (Tween 60--Atlas ICI America)	4.6 gm.	9.0	41.4
Separated and Purified Cellulose Fibers (Brown Company Solka-Floc BW-300)	262.28 gm.	0.0	0.0
	1000.00 gm.		1317.06 Cal.

three minutes and the resulting mucilage held in a hot water bath at 175°F. for 10 minutes.

The 2.3 gm. of guar gum was added in-stream fashion to 160.8 gm. of water at 100°F. in a Waring blendor set at first speed to create a vortex. After mixing for three minutes the resulting mucilage was held at 100°F. for further processing.

The 0.9 gm. of carrageenan was added in-stream fashion to 102.0 gm. of water at 120°F. in a Waring blendor set at first speed to create a vortex. After three minutes of mixing the gum mucilage was held at 120°F. for further processing.

The 46.4 gm. of gelatin used as a cohesive gelling agent, was added to and mixed in with 111.3 gm. of water at approximately 60°F. in a metal mixing container, and the container was then placed in a water bath at 120°F. for one hour to dissolve the gelatin.

The 92.7 gm. of corn oil and the 4.6 gm. of polyoxyethylene (20) sorbitan monostearate were heated and mixed together at approximately 130°F. The locust bean, guar gum, and carrageenan gum mucilages were added together and mixed in a Waring blendor for two minutes. The heated corn oil and Tween 60, and all of the other above ingredients except the cellulose fibers and the cocoa powder were added in to the gum mucilage mixtures and mixed in at high speed of the Waring blendor for three minutes.

The 262.28 gm. of cellulose fibers and the 56.5 gm. of cocoa powder were placed in the bowl of a small Hobart mixer and all of the other previously mixed ingredients were added thereto and mixed in for five minutes on high speed with a beater.

The final product was spread onto a polyethylene sheet on a cold table and the top of

the product was covered with another polyethylene sheet. After setting for six hours at room temperature (70°F.), the product had attained a cohesive gel structure and was firm enough to be cut into candy-sized cubes by a knife. The candy cubes were wrapped in a polyethylene film impermeable to moisture to enhance the stability of the candy.

The candy loaf product had a cohesive solid consistency similar to that of cocoa fudge. The pH of the candy loaf was approximately 4.8, with the product having a caloric value of 1.317 calories per gram as compared to a caloric value of approximately 4 calories per gram for regular chocolate candies. The cellulose fiber comprised 49.19% of all non-water ingredients. The non-gelling agent hydrocolloids and the corn oil comprised respectively 1.03% and 17.39% of the non-water ingredients. The gelatin comprised 4.64% of the total weight of all ingredients including water, and 8.7% of the non-water ingredients.

EXAMPLE XIV

One kilogram of low calorie imitation lemon flavor candy loaf composition having a solid structure was prepared having the following ingredients.

The 2.54 gm. of locust bean gum was added in-stream fashion to 101.68 gm. of water at 175°F. in a Waring blendor set at first speed to create a vortex. After mixing for three minutes, the resulting mucilage was held in a

Ingredient	Amount	Calories Per Gram	Total Calories
Water	511.93 gm.	0.0	0.0
Locust Bean Gum	2.54 gm.	4.0	10.16
Guar Gum	2.54 gm.	4.0	10.16
Carrageenan, Iota Type	0.86 gm.	4.0	3.84
Gelatin 225° Bloom	26.43 gm.	3.35	88.54
Sodium Cyclamate	16.27 gm.	0.0	0.0
Sorbitol 70% Solution	41.70 gm.	2.8	116.76
Potassium Sorbate (Sorbistat K)	0.86 gm.	0.0	0.0
Sodium Benzoate	0.42 gm.	0.0	0.0
Citric Acid, Hydrous	2.23 gm.	4.0	8.92
Artificial Milk Flavor (Norda)	0.4 gm.	4.0	1.6
Artificial Butter Flavor (Firmenich)	0.04 gm.	4.0	0.16
Yellow Color No. 5, 10% Solution	0.30 gm.	0.0	0.0
Lemon TruType--Bush, Boake & Allen	0.81 gm.	4.0	3.24
Corn Oil	101.68 gm.	9.0	915.12
Polyoxyethylene (20) Sorbitan Monostearate (Tween 60--Atlas ICI America)	5.08 gm.	9.0	45.72
Separated and Purified Cellulose Fibers (Brown Company Solka-Floc BW-300)	285.81 gm.	0.0	0.0
	1000.00 gm.		1204.22 Cal.

hot water bath at 175°F. for 10 minutes.

The 2.54 gm. of guar gum was added in-stream fashion to 176.38 gm. of water at 100°F. in a Waring blendor set at first speed to create a vortex. After mixing for three minutes, the resulting mucilage was held at 100°F. to await further processing.

The 0.96 gm. of carrageenan was added in-stream fashion to 101.85 gm. of water at 120°F. in a Waring blendor set at first speed to create a vortex. This mixture was also mixed for three minutes and thereafter held at 120°F.

The 26.43 gm. of gelatin was mixed in with 122.02 gm. of water at approximately 60°F. in a small mixing container, and the mixing container was then placed in a water bath at 120°F. for one hour to dissolve the gelatin.

The 101.68 gm. of corn oil and the 5.08 gm. of Tween 60 were heated and mixed together at approximately 130°F. The locust bean gum, guar gum, and carrageenan mucilages were added together and mixed in a Waring blendor for two minutes, and the corn oil--Tween 60 mixture and all of the other above listed ingredients except the cellulose fibers were added to the gum mucilage mixture and mixed in on high speed for three minutes.

The cellulose fibers were placed in the bowl of a small Hobart mixer and the other mixed ingredients were added therein and mixed together with a beater on high speed for five minutes.

After mixing, the ingredients were spread onto a polyethylene sheet on a cold table, and the top was covered with another polyethylene sheet. After setting for six hours at room temperature (70°F.), the product had attained a gel structure and was firm enough to be cut into suitable sized cubes by a knife.

The resulting loaf candy had a cohesive solid texture similar to that of natural fondant candies. The ph of the lemon flavored candy was approximately 4.5, with a caloric value of 1.201 calories per gram as compared to about 4 calories per gram for ordinary sugar based candies of this type. The cellulose fiber comprises 58.56% of all non-water ingredients, the non-gelling agent hydrocolloids comprised 1.24% of all non-water ingredients, and the corn oil comprised 20.83% of all non-water ingredients. The gelatin comprised 2.643% of all ingredients including water, and 5.42% of the non-water ingredients.

EXAMPLE XV

A kilogram of pasteurized low calorie imitation lemon flavor candied loaf composition, having a solid cohesive structure, was prepared having the following ingredients, (see next page).

The 2.5 gm. of locust bean gum was added in-stream fashion to 79.0 gm. of water at 175°F. in a Waring blendor set at first speed to create a vortex. After mixing for three minutes, the resulting mucilage was held in a hot water bath at 175°F. for ten minutes. The 2.5 gm. of guar gum was added in-stream fashion to 118.0 gm. of water at 100°F. in a Waring blendor set at first speed to create a vortex. After mixing for three minutes, the resulting mucilage was held a at 100°F. to await further processing. The 0.9 gm. of carrageenan was added in-stream fashion to 102 gm. of water at 120°F. in a Waring blendor set at first speed to create a vortex. This gum mucilage was also mixed for three minutes and thereafter held at 120°F.

The 118.3 gm. of gelatin was mixed in with 158.0 gm. of water at approximately 60°F. in a small mixing container, and the mixing container was then placed in a water bath at 120°F. for one hour to dissolve the gelatin.

The 98.6 gm. of corn oil and the 5.0 gm. of Tween 60 were heated and mixed together at approximately 130°F. The locust bean gum, guar gum, and carrageenan mucilages were added together and mixed in a Waring blendor for two minutes, the corn oil, Tween 60, mixture was added thereto, and all of the other above listed ingredients except the glucona delta lactone and the cellulose fibers were added to the gum mucilage mixture and mixed in at high speed for three minutes.

The cellulose fibers were placed in a bowl of a Hobart mixer and the above mixed ingredients were added therein and mixed together with a beater on high speed for five minutes. The glucona delta lactone was then added thereto and mixed in for one minute. Use of glucona delta lactone allows the pH of the resulting product to be adjusted, but because of its slow acting acidic characteristic, it does not substantially interfere with the formation of the gel.

The above mixed product was placed in heat resistant plastic bags, and the bags were placed in a hot water bath at 165°F. for pasteurization. The temperature of the product in each bag was measured, and the product was maintained within the bath for 30 minutes from the time that the temperature at the center of the product was 160°F. The product was then extruded through a sterilized auger type extruder into cylindrically shaped ropes which were passed into a sterilized cold tunnel at a temperature of 50°F.

After passing through the extruder, the rope like portions of the product were maintained at room temperature for a period of six hours, and the ropes were then cut into pieces. The resulting loaf type candy had a cohesive solid texture with a slight chewiness to the taste. The pH of the resulting candy loafs was approximately 4.3 with a caloric value of 1.512 calories per gram as compared to about 4 calories per gram for sugar based candies. The cellulose fiber comprised 38.30% of all non-water ingredients, the non-gelling agent hydrocolloids comprised 0.92% of all non-water ingredients, and the corn oil comprised 15.33% of all non-water ingredients. The gelatin comprised 11.83% of all ingredients including water, and 18.40% of the non-water ingredients.

Ingredient	Amount	Calories Per Gram	Total Calories
Water	457.0 gm.	0.0	0.0
Locust Bean Gum	2.5 gm.	4.0	10.0
Guar Gum	2.5 gm.	4.0	10.0
Carrageenan	0.9 gm.	4.0	3.6
Gelatin, 225° Bloom	118.3 gm.	3.35	396.31
Sodium Cyclamate	15.75 gm.	0.0	0.0
Saccharin	0.78 gm.	0.0	0.0
Sorbitol 70% Solution	40.4 gm.	2.8	113.12
Glucona Delta Lactone	10.0 gm.	4.0	40.0
Artificial Milk Flavor (Norda)	0.4 gm.	4.0	1.6
Artificial Butter Flavor (Firmenich)	0.04 gm.	4.0	0.16
Yellow Color No. 5, 10% Solution	0.3 gm.	0.0	0.0
Lemon TruType	1.23 gm.	4.0	4.92
Corn Oil	98.6 gm.	9.0	887.40
Polyoxyethylene (20) Sorbitan Monostearate (Tween 60--Atlas ICI America)	5.0 gm.	9.0	45.0
Separated and Purified Cellulose Fibers (Brown Company Solka-Floc BW-300)	246.3 gm.	0.0	0.0
	1000.00 gm.		1512.11 Cal.

EXAMPLE XVI

One kilogram of an oleaginous fibrous food composition having a flavor and texture simulating that of deviled ham was prepared having the following ingredients.

Ingredient	Amount
Water	604.94 gm.
Locust Bean Gum	3.67 gm.
Guar Gum	3.67 gm.
Carrageenan	0.72 gm.
Sorbitol 70% Solution	31.74 gm.
Salt (Sodium Chloride)	27.48 gm.
Potassium Sorbate (Sorbistat K)	0.77 gm.
Sodium Benzoate	0.38 gm.
Citric Acid, Hydrous	0.50 gm.
Monosodium Glutamate	1.08 gm.
Worcestershire Sauce	1.54 gm.
Instant Caramel 602	1.23 gm.
Red Shade Replacement No. 2, 10% Solution	0.15 gm.
Total Ham Flavor (Polak's Frutal Works)	5.04 gm.
Corn Oil	57.06 gm.
Polyoxyethylene (20) Sorbitan Monostearate (Tween 60--Atlas ICI America)	2.71 gm.
Textured Vegetable Protein (Miratex 210, Staley's)	53.11 gm.
Separated and Purified Cellulose fibers (Brown Company Solka-Floc BW-300)	204.21 gm.

The textured vegetable protein (TVP) chunks were first grated and sized to yield chunks which would provide the desired texture to the overall product. This was accomplished by putting the TVP in a Waring blendor type mixer.

The mixer was put on a grating speed for 15 seconds, and the grated TVP was passed through a sixteen mesh sieve. The portion retained by the sieve was regrated in the mixer. The sifted portion was then passed through an 18 mesh sieve. 53.11 gm. of the TVP that was retained on the 18 mesh sieve was then mixed and soaked for 30 minutes in a previously mixed solution of 108.40 gm. of water at 120°F., 0.12 gm. of potassium sorbate, 0.06 gm. of sodium benzoate, and 0.04 gm. of hydrous citric acid. This mixture was retained for later incorporation into the final product.

The first gum mucilage was prepared by adding the 3.67 gm. of locust bean gum in-stream fashion to 138.41 gm. of water at 175°F. in a Waring blendor set on first speed to create a vortex. This mucilage was mixed for three minutes, then held and stirred in a hot water bath at 175°F. for ten minutes.

The 3.67 gm. of guar gum was added in-strea stream fashion to 232.98 gm. of water at 100°F. in a Waring blendor set on first speed to create a vortex. After mixing for three minutes, the gum mucilage was held for further processing at 100°F.

The 0.72 gm. of carrageenan was added in-stream fashion to 125.15 gm. of water at 120°F. in a Waring blendor set at first speed to create a vortex. After three minutes of mixing, the other gum mucilages described above were added thereto and mixed in for two minutes.

The corn oil and the polyoxythylene (20) sorbitan monostearate were mixed and heated to 130°F. and then were added into the gum mucilage mixture. All of the other above ingredients except the cellulose fibers and the hydrated TVP were added to the corn oil--mucilage mixture and were mixed in on high speed for three minutes.

The separated cellulose fibers were placed in the bowl of a Hobart mixer and the above described mixture was added thereto and mixed in for five minutes on high speed with a beater. The hydrated TVP was then added thereto and mixed in for three minutes.

The final oleaginous fibrous simulated deviled ham product had a pH of approximately 5.6 and a strong ham flavor. The chunks of TVP were readily discernable upon tasting, and gave the product an overall chewy, meaty texture. The fibrous cellulose comprised 51.96% of all non-water ingredients and 75.82% of the non-water base ingredients. The hydrocolloids and the oil comprised respectively 3% and 21.19% of the non-water base ingredients.

The fundamental ingredients required to produce an oleaginous fibrous food composition in accordance with our invention having a substantial proportion of non-caloric cellulose fiber are the particulate cellulose fiber itself, water, edible oil, and edible gum. These ingredients have been referred to herein as the "base ingredients". Where a gelled structure is desired, at least one of the edible gums will be a gelling agent. As described above, cellulose fiber utilized may be any fibrous particulate material of sufficiently small fiber size to be utilized in food products. The water provides a non-caloric base for the product which gives the product softness and spreadability. Clean tap water may be used with adjustments to the final pH of the product being made as desired. Pasteurization and bacteriological control agents may be utilized as necessary to provide satisfactory stability.

The hydrocolloids (gums) such as those listed above for the various Examples function to provide the coherency and fundamental texture of the resulting product. The gum combination acts as a moisture binder and a thickening agent, and provides a colloidal suspension matrix in which the solid fibrous cellulose particles are held. The gum solutions also render the relatively rough natural fibrous cellulose particle smooth to the palate. Thus, a sufficient amount of gum must be used to support the desired quantity of cellulose particles in suspension. The gum combination acts secondarily to help stabilize the oil in water emulsion when oils are added to the basic product. The gums coincidentally function as a whipping agent, as an inhibitor of syneresis, and to a certain extent simulate an oleaginous texture which is desirable from the standpoint of palatability with respect to simulated foods of the nature of margarines, cheeses, dips and related types of foods. A number of other gums may be used in the product of the invention, including by way of example, but not limitation gum ghatti, gum karaya, gum tragacanth, psyllium seed gum, quince seed gum, high and low methoxylated pectins, aribinogalactan, agar, furcelleran, alginates, modified and pregelatinized starches, dextran, xanthan and related microbial gums, gelatin, cellulose gum derivatives, and synthetic hydrocolloids. The combination of various gums is usually preferable although only one gum is necessary, since each type of gum provides different qualities of palatability and mouth feel to the final product. A particular combination of gums may thus be selected to obtain better mouth feel and texture than may be obtained with any single type of gum.

As stated previously, one or more of the edible gums may also function as a cohesive gelling agent, to cause the composition to "set up" and support the cellulose particles in a continuous cohesive gel structure which, for example, may produce a loaf-like product with sliceability. As previously indicated, such cohesive gelling agents may be used in substantial percentages up to 50% of the dry weight of the simulated product. Among the edible gums which function as cohesive gelling agents are gelatin, alginates, agar, carrageenan, high and low methoxylated pectins, modified and pregelatinized starches, furcelleran, albumen, modified casein, modified soy protein, and gum acacia. All such gel forming hydrocolloids in-

cluding gelatin are denoted herein as "gums" because of their similar ability to be dispersed in water to form viscous solutions or dispersions. See e.g., M. Glicksman, *Gum Technology in the Food Industry*, Academic Press, New York and London, 1969. As noted in Glicksman, Ibid. at p. 23, the gelation of such gelling gum or gums in mixture with the other ingredients of our product may be obtained by providing gel inducing conditions to the mixture, such as addition of a non-solvent, evaporation of solvent, the addition of a cross linking agent, reducing the solubility of the solute by chemical reaction, changing the temperature, and adjusting the pH. Such techniques are well known in the food industry, and may be utilized as desired to obtain the required gel structure of the fibrous food products in accordance with our invention.

The corn oil provides a smooth flavor sensation and reduces the gummy texture inherent in the gum solution. It also permits the incorporation of air when used in conjunction with the polyoxyethylene (20) sorbitan monostearate, which it solubilizes, while it also solubilizes the beta-carotene used to color the margarine, thus allowing simulation of the density and character of the desired product. Other equivalent types of oil are safflower oil, cotton seed oil, peanut oil, sesame oil, soy bean oil, sunflower seed oil, coconut oil, and other vegetable oils, with the addition of anti-oxidants as necessary. Hydrogenated fats and oils may also be utilized by heating the solid fats to a liquid before combining with the other ingredients. Saturated fats and all animal fats are preferably avoided as much as possible because of the desirability of limiting the intake of such fats by humans, but where such fats are desirable, saturated and animal fats may also be used.

The other ingredients listed in the examples given above are provided for the purpose of flavoring, coloring, to enhance physical and biological stability, and to provide a product texture and form as similar as possible to the food product being simulated. Thus these ingredients are not critical to our invention, but are desirable to provide an oleaginous fibrous simulated food product which is as close to natural as possible and which is platable to the consumer. The function of these additional ingredients, and examples of alterative products having similar functions are listed below.

The polysorbate 60 or Tween 60 (polyoxyethylene (20) sorbitan monostearate) promote and stabilize an oil in water emulsion and facilitate the incorporation of air into the overall mixture. Any emulsifying agent that promotes an oil in water emulsion may be utilized, such as lecithin, decaglycerol distearate, decaglycerol monolaurate, ethoxylated mono- and di-glycerides, polyethylene glycol, and lactylil stearate, polyoxyethylene (20) sorbitan tri-stearate, polyoxyethylene (20) sorbitan mono-oleate, sorbitan monostearate, propylene glycol, and glycerol monostearate.

The sorbitol 70% solution provides sweetness and humectancy, and also provides a certain amount of preserving action. Other ingredients providing these functions to a substantial extent are glycerine, propylene glycol, dextrose, sucrose, corn syrup (dry or wet), invert sugar, fructose, levulose, lactose, maltose, and xylose. The salt (sodium chloride) is provided for the purpose of flavor and also has some incidental preserving action. Potassium chloride may alternatively be utilized in products for those persons whose intake of sodium chloride must be limited.

The potassium sorbate (sorbistat K) and the sodium benzoate are both utilized as microbial inhibitors. Other feasible microbial inhibitors are sorbic acid, sodium sorbate, benzoic acid, methyl and propyl ester of P-hydroxybenzoic acid, and propionic acid. Pasteurization can be utilized to inactivate pathogenic organisms. Sterilization and aseptic packaging may also be used as appropriate. If the product is to be handled and stored without refrigeration, the pH of the final product must be maintained at 4.6 or less.

The citric acid acts as a flavoring agent and also provides inhibition of microbial growth since it lowers the pH to safer levels, and also permits the other microbial inhibitors to be more effective. Anydrous citric acid would also be utilized, as well as lactic acid, acetic acid, malic acid, fumaric acid, adipic acid, tartaric acid, and potassium hydrogen tartrate.

The yellow color No. 5, 10% solution and the yellow color No. 6, 10% solution are provided to simulate the color of cheese. Various types of annato may also be utilized to simulate such colors, and it is apparent that other food colorings would be appropriate where other products are being simulated.

It is apparent that the flavoring materials will depend on the particular product being simulated, and can be added in varying amounts to satisfy the particular taste as desired.

Various other food materials having beneficial nutritional value, including high, medium, and low calorie content materials, may be added to my base product to provide simulated foods which will satisfy consumers' concern and need for nutrition. Such materials, which provide nutrition in addition to that supplied by the gums and oil, can consist of proteins, fats or carbohydrates, or combinations thereof. One example of a simulated food composition which includes nutritional material in the form of textured vegetable protein (TVP) is the product of Example XVI, above.

We make no claim to the use of the present invention in contravention of the Emulsifiers and Stabilisers in Food Regulations 1486/75 or the Preservatives in Food Regulations 1487/75. Subject to the foregoing disclaimer.

WHAT WE CLAIM IS:—

1. An oleaginous fibrous food base composi-

tion for simulated food products comprising:

(a) a binding mixture of edible oil and edible gum (as herein defined) in water; and

(b) at least 10% on a dry weight basis of particulate fibrous cellulose uniformly intermixed within the binding mixture.

2. A composition according to claim 1, wherein the particulate fibrous cellulose comprises from 10% to 85% of the composition on a dry weight basis.

3. A composition according to claim 1 or 2, wherein the edible oil comprises from 5% to 60% of the composition on a dry weight basis.

4. A composition according to claim 1, 2 or 3, wherein the edible gum comprises at least 0.1% of the composition on a dry weight basis.

5. A composition according to claim 1, 2, 3 or 4, wherein the fibrous cellulose particles have an average particle length of 40 microns or less.

6. A composition according to claim 1, 2, 3, 4 or 5, wherein the fibrous cellulose comprises refined powdered cellulose derived from wood pulp.

7. A composition according to claim 6, wherein the fibrous cellulose comprises refined powdered cellulose derived from wood pulp which has been solvent treated to substantially remove the noncellulose constituents.

8. A composition according to any preceding claim, including a flavoring agent present therein to simulate a natural food flavor in the composition.

9. A composition according to any preceding claim, wherein the or at least one of the edible gums is a cohesive gelling agent which is present in an amount sufficient to provide a cohesive gel structure which supports the fibrous cellulose.

10. A composition according to claim 9, wherein the cohesive gelling agent comprises from 1% to 50% of the composition on a dry weight basis.

11. A composition according to claim 9 or 10, wherein the cohesive gelling agent is selected from gelatin, alginates, agar, carrageenan, furcelleran, methoxylated pectin, modified starch, pre-gelatinized starch, albumen, modified casein, modified soy protein, and gum acacia.

12. A composition according to any preceding claim, including an acid pH modifying substance present in the composition in an amount sufficient to lower the pH of the composition to a value of not more than 4.6.

13. A composition according to any preceding claim, wherein the edible gum includes at least one gum selected from carrageenan, carboxymethylcellulose, locust bean gum, guar gum, gum acacia, gum ghatti, gum karaya, gum tragacanth, psyllium seed gum, quince seed gum, high and low methoxylated pectins, aribinogalactan, agar, furcelleran, alginates, dextran, xanthan, cellulose gum derivatives, and synthetic hydrocolloids.

14. A composition according to any preceding claim, including an emulsifying agent uniformly intermixed therein in an amount sufficient to stabilize an emulsion of the oil in the binding mixture.

15. A composition according to claim 14, wherein the emulsifier includes at least one emulsifier selected from polyoxyethylene (20) sorbitan monostearate, lecithin, decaglycerol distearate, decaglycerol monolaurate, ethoxylated monoglyceride, ethoxylated diglyceride, polyethylene glycol, lactylil stearate, polyoxyethylene (20) sorbitan tri-stearate, polyoxyethylene (20) sorbitan mono-oleate, sorbitan monostearate, propylene glycol, and glycerol monostearate.

16. A composition according to any preceding claim, wherein the edible oil is selected from corn oil, safflower oil, cotton seed oil, peanut oil, sesame seed oil, soy bean oil, coconut oil and sunflower seed oil.

17. A composition according to any preceding claim, including at least one additional nutritional food material within the binding mixture.

18. A composition according to claim 17, wherein said additional nutritional food material is textured vegetable protein.

19. A composition according to any preceding claim, including a coloring agent therein to simulate a natural food color in the composition.

20. A composition according to any preceding claim, including a microbial growth inhibiting agent.

21. A process for producing an oleaginous fibrous food composition for simulated food products comprising:

(a) mixing at least one edible gum (as herein defined) with water at a mixing speed and temperature sufficient to maintain the gum in suspension without lumping;

(b) mixing an edible oil with at least one emulsifier at a temperature sufficient to completely melt the oil and emulsifier mass;

(c) thoroughly mixing the oil and emulsifier mass with the edible gum and water suspension to produce a binding mixture; and

(b) thoroughly mixing particulate fibrous cellulose into the binding mixture to uniformly distribute the fibrous cellulose particles throughout the entire mass of the binding mixture in an amount, on a dry weight basis, of at least 10%.

22. A process according to claim 21 wherein, prior to the addition of particulate fibrous cellulose to the binding mixture, the binding mixture is subjected to additional treatment comprising:

(a) heating the binding mixture to a temperature of at least 120°F., and

(b) passing the binding mixture through a homogenizer to stabilize the suspension of gum and oil within the mass of the binding mixture.

23. A process according to claim 21,

wherein the composition is heat treated at sufficient temperature and for sufficient time to pasteurize the mass of the composition.

24. A process according to claim 21, 22 or 23, including the additional step of adding an acid pH-modifying substance to the composition in an amount sufficient to adjust the pH to a value of not more than 4.6.

25. A process according to claim 21, 22, 23 or 24, wherein the gum is at least one selected from carrageenan, carboxymethylcellulose, locust bean gum, guar gum, gum acacia, gum ghatti, gum karaya, gum tragacanth, psyllium seed gum, quince seed gum, high and low methoxylated pectins, aribinogalactan, agar, furcelleran, alginates, modified and pregelatinized starches, dextran, xanthan and related microbial gums, gelation, cellulose gum derivatives, and synthetic hydrocolloids.

26. A process according to claim 21, 22, 23, 24 or 25, wherein the emulsifier is at least one selected from polyoxyethylene (20) sorbitan monostearate, lecithin, decaglycerol distearate, decaglycerol monolaurate, ethoxylated mono- and di-glycerides, polyethylene glycol, lactylil stearate, polyoxyethylene (20) sorbitan tristearate, polyoxyethylene (20) sorbitan monooleate, sorbitan monostearate, propylene glycol, and glycerol monostearate.

27. A process according to any of claims 21 to 26, wherein the edible oil is selected from corn oil, safflower oil, cotton seed oil, peanut oil, sesame seed oil, soy bean oil, coconut oil and sunflower seed oil.

28. A process according to any of claims 21 to 27, wherein the fibrous cellulose comprises refined powdered cellulose derived from wood pulp.

29. A process according to any of claims 21 to 28, wherein the fibrous cellulose particles have an average particle length of not more than 40 microns.

30. A process according to any of claims 21 to 29, wherein the water comprises at least 40% by weight of the final composition.

31. A process according to any of claims 21 to 30, wherein the fibrous cellulose comprises from 10% to 85% of the final composition on a dry weight basis.

32. A process according to any of claims 21 to 31, wherein the edible oil comprises from 5% to 60% of the composition on a dry weight basis.

33. A process according to any of claims 21 to 32, wherein the edible gum comprises at least 0.1% of the composition on a dry weight basis.

34. A process according to any of claims 21 to 24, wherein the or at least one of the edible gums is a cohesive gelling agent, and wherein the process includes the additional step of providing gel inducing conditions for a period of time sufficient for said gelling agent to set such that the fibrous food composition attains a cohesive gel structure.

35. A process according to claim 34, wherein the cohesive gelling agent is selected from gelatin, alginate, agar, carrageenan, furcelleran, methoxylated pectin, modified starch, pre-gelatinized starch, albumen, modified casein, modified soy protein, and gum acacia.

36. A process according to claim 34 or 35, wherein the cohesive gelling agent comprises from 1% to 50% of the composition on a dry weight basis.

37. A process according to claim 34, 35 or 36, wherein before the said additional step of providing gel inducing conditions, the composition is heat treated at sufficient temperature and for sufficient time to pasteurize the mass of the composition.

38. A process according to any of claims 21 to 37, wherein at least one coloring substance is added to the binding mixture to simulate a natural food color in the composition.

39. A process according to any of claims 21 to 38, wherein at least one flavoring substance is added to the binding mixture to simulate a natural food flavor in the composition.

40. A composition according to claim 1, substantially as herein described in the Examples.

41. A process according to claim 21, substantially as herein described in the Examples.

42. An oleaginous fibrous food composition which has been produced by a process as claimed in any of claims 21 to 39 or 41.

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