

UNITED STATES PATENT OFFICE

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PREPARATION OF MARSHMALLOW

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This invention relates to the preparation of marshmallow and like products.

In the present practice, marshmallow is produced by whipping sugars and/or syrups with a whipping agent such as gelatin at temperatures at or above room temperature to produce a light, fluffy white emulsion of air in the syrup mixture. When gelatin is used, as is nearly always the case, the product has the following characteristics:

The marshmallow has a gelatinous nature probably due to the gel forming properties of the gelatin. On aging such material, as on a cookie base, the marshmallow progressively becomes more and more tough or rubbery. There also occurs a syneresis or exudation of liquid from within causing the appearance of liquid droplets on the surface of the piece. The above changes occur even when the cookie is coated or enrobed with a chocolate film. Ultimately, within thirty to sixty days, the marshmallow has become inedible due to the changes.

An object of the present invention is to provide a method for increasing the tenderness of the marshmallow at the time of manufacture and after a long period of storage. Another object is to provide a whipping mixture which will produce marshmallow in which there is substantially no syneresis or exudation of liquid on the surface of the piece. Yet another object is to provide a whipping material producing a marshmallow which is of greater volume and which handles better from a physical standpoint in machine used to deposit it on cookies. Yet another object is to provide a whipping mixture which produces a marshmallow product which shrinks less and which remains edible for a much longer period. Other specific objects and advantages will appear as the specification proceeds.

In the practice of our invention, the usual mixture of syrups, which may be natural syrups or syrups formed by the addition of sugar to water, with gelatin is employed. Before whipping, we add a soy protein or glycinin which has been modified to increase its water solubility. The modified product, through physical or chemical changes which we have not yet fully ascertained, produces a definite effect on the gelatin and syrup mixture with the result that the final marshmallow product is considerably more tender and no syneresis or exudation of liquid occurs on the surface of the piece. Further, the marshmallow product remains edible for a period at least fifty per cent more than that of the marshmallow formed without the addition of the protein. The new product has a greater volume and

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the volume does not shrink as when gelatin is used alone.

The modified soy protein or glycinin material for mixing with the syrup and gelatin may be formed by any suitable method. The application of John R. Turner, Serial No. 594,373, for Modified Soy Protein and the Preparation Thereof, now Patent No. 2,489,208, and the application of Louis Sair and James K. Gunther, Serial No. 595,472, for Modified Soy Protein and the Preparation Thereof, now abandoned, both set out satisfactory processes for production of such a protein or glycinin material.

In the first above-mentioned application, the treatment of the soy protein may be in a series of steps in which the glycinin is isolated from the other soy bean constituents and subjected to controlled modification. The steps may consist of the extraction of the protein in soluble form from soy bean material, the precipitation of the glycinin from the water soluble extract at or near the iso-electric pH range of the glycinin, the washing of the precipitated glycinin, the enzymatic modification of the glycinin, and heat treatment of the partially modified glycinin. If desired, the heat treatment may be omitted and the pH raised to inactivate the enzymes after the enzymatic step.

The modification is carried to the extent of rendering the modified glycinin substantially soluble in water at a pH of 5.0 or at least to the extent of 50% thereof. As a further product, the glycinin is modified until at least 30% of the modified glycinin is in the form of protein soluble in water at a pH of 5.0 and wherein between 25% and 45% of the nitrogen thereof is in the form of non-protein nitrogen in the water-soluble constituents of the product.

As a specific example of the process just described, the following is set out:

331 gms. of sodium sulphite (2% based on wt. of flakes) were added to 430 lbs. of water heated to 130° F. The pH of the solution was 7.8. 36 lbs. of solvent extracted soy bean flakes were added and the slurry was agitated for 1½ hrs. The pH of the slurry was 6.8. 10 lbs. of Celite 545 were then added and the slurry was then filtered through a Sperry filter press. The pH of the clear liquor (90° F.) was adjusted to 4.2 with sulphur dioxide, and after allowing 3 hours for settling, the supernatant liquid was decanted off. The curd was given 2 washings with two fold volumes of water. The final solids in the curd was 13.2% and the yield of isolated protein based on the weight of the flakes was 24.6%.