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3,544,333

MACARONI PRODUCTS MADE WITH NONFAT MILK SOLIDS

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No Drawing. Continuation of application Ser. No. 696,998, Jan. 11, 1968, which is a continuation-in-part of application Ser. No. 437,294, Mar. 4, 1965. This application Jan. 29, 1969, Ser. No. 800,334

Int. Cl. A231 1/16

U.S. Cl. 99—85

5 Claims

ABSTRACT OF THE DISCLOSURE

Macaroni products containing 1% to 30% by weight nonfat milk solids and Iota type carrageenan in an amount sufficient to improve texture, stability and cooking stability of said products are prepared.

This application is a continuation of U.S. application Ser. No. 696,998 filed Jan. 11, 1968, which in turn is a continuation-in-part of U.S. application Ser. No. 437,294 filed Mar. 4, 1965 both now abandoned.

This invention relates to a new and improved product which is herein referred to as an improved nonfat milk macaroni product.

The name "macaroni product" has a well defined meaning as defined in the definitions and standards of identity for macaroni and noodle products promulgated under the United States Federal Food, Drug and Cosmetic Act and published in Part 16, Chapter I, Title 21 of the Code of Federal Regulations (see the Federal Register Oct. 13, 1964).

Macaroni products are the class of food, each of which is prepared by drying formed units of dough made from semolina, durum flour, farina, flour or any combination of two or more of these with water and with or without one or more optional ingredients. Macaroni is the macaroni product the units of which are tube-shaped and more than 0.11 inch and less than 0.027 inch in diameter. Spaghetti is the macaroni product the units of which are tube-shaped or cord-shaped (not tubular) and more than 0.06 inch but not more than 0.11 inch in diameter. Vermicelli is the macaroni product the units of which are cord-shaped (not tubular) and not more than 0.06 inch in diameter.

Milk macaroni products as defined in the aforesaid definitions and standards of identity contain not less than 3.8% milk solids by weight of the finished milk macaroni product. The milk ingredients must be concentrated milk, evaporated milk, dried milk, or a mixture of butter with skim milk (dried skim milk), or any two or more of these, in such proportions that the weight of nonfat milk solids in such mixture is not more than 2.275 times the weight of milk fat therein. This requires the use of at least 1.67% by weight milk fat to meet the standard of identity.

The process for making macaroni products is the same regardless of the eventual shape of the finished piece. This is determined by the type of die through which the dough is extruded. The original process for making macaroni as used by all of the manufacturers in the industry con-

sists of feeding durum semolina and/or flours into a standard macaroni mixer. This is a "continuous" type mixer. Water is metered into the same end of the mixer at which the flour is admitted. The amount is generally between 30% to 35% based on the weight of semolina. The mixer combines the water and semolina into a loose dough. The characteristic of this dough is very dry and crumbly. It is completely dissimilar from a bread dough because if durum semolina is used exclusively, the dough retains a short characteristic rather than a stretchable characteristic which is typical of bread dough made from ordinary hard wheat flour. If ordinary hard wheat flour is employed in making macaroni the formation of a "stretchable" dough must be avoided since formation of this type would give extreme difficulty in the later stages of the manufacturing process, particularly in the extrusion stage.

The loose dough described above is conducted to an adjacent, but frequently contiguous piece of machinery known as the press. In this area, and in some mixers throughout all but the first stages of the mixing, the dough is mechanically manipulated under a vacuum of 21" to 27" of mercury. The vacuum-mixing in this chamber serves to draw out all collections of air or other gases which might be mechanically entrapped in the dough. These small bubbles give rise to macaroni products with uneven surfaces and can cause some cracking or breaking of the finished dried product. Another reason for the vacuum-mixing is to prevent the oxidase enzymes in the flour (durum or ordinary hard wheat) from oxidizing the natural carotin, or yellow pigment of the wheat, into a colorless substance. The process is upset if the enzyme has no oxygen which which to complete the reaction. The macaroni industry strives to make product with as much natural yellow color as is possible. White macaroni products are less desirable than those having a yellow or creamy color after having been prepared for table use.

The dough as it leaves the vacuum area is forced by mechanical means through a die which determines the shape of the end product. There are many well known shapes, all of which are brought about by the particular construction of the aperture in the die. Changes in shapes are brought about by locating retarding points in the apertures which cause the extruding dough to turn and assume the shape of an elbow macaroni, or to assume the shape of sea-shells as in "shell macaroni" and others.

Upon coming from the die the product is cut by means of automatically operating knife blades. In the case of "spaghetti" the dough is extruded as long thin rods, approximately 50" to 60" in length. These rods are then folded in half and automatically hung over rods or "sticks." Each rod of spaghetti dough lies adjacent to other rods and must not lie on top of another rod.

In the case of "short goods" which is macaroni, elbow macaroni, shell macaroni, and other short pieces, the cutting mechanism cuts the dough by means of travelling across the surface of the die. The speed of the blade determines the length of the piece.

Commonly, these pieces are then dropped into an air conveying system which conducts the pieces to a hopper. From here the pieces are spread by a mechanical spreader on trays or on continuous belts, both of which then go into the drying chambers. In the case of short goods, the depth of the macaroni pieces is sometimes several inches.