

GOGANI COMPANY

Manufacturer of Pharmaceutical

& Biological Machinery

Bioprocess Solution

Bioprocess Consultation

Egg Products

Powdered Egg

(Processing Systems & Machinery)

Egg Products

The largest consumers of eggs have long recognized that shell eggs are unsuitable as raw material in a food industry geared to modernization. Frozen eggs have been found much more reliable and convenient. In the course of modernization, however, large egg consumers, faced with the need to further improve product quality and expand product varieties had to reduce manufacturing costs. The main users of egg products are bakeries, confectionery, macaroni, and noodle manufacturers, the meat handling industry,

large scale catering, hotels, etc. Gogani Co. can offer drying plants for variety of dried products, such as normal whole egg, egg yolk, and egg white powder, bacteriological or enzymatic fermented albumin powder, instant sugared whole egg or egg white powder and many others.



Pre-treatment of Albumin

Fermentation of eggs

Whereas the pre-treatment of whole egg and yolk pulp is fairly simple, it is necessary to expose the albumin pulp to a comprehensive pre-treatment; i.e. a fermentation and ammonium treatment. The fermentation serves to break down the glucose in the egg pulp, because the glucose is detrimental to the quality of the dried egg products.

In the storage, heating, and drying stages, the glucose will react with the protein and give the so-called "Maillard Reaction". The reaction will cause a brownish colour and some insoluble compounds. Furthermore, the amount of glucose affects the whipping properties of powdered egg white and the keeping quality of the powdered product. As a rule of thumb the shelf life of the egg powder is doubled if made from fermented products.



Preserving the whipping properties

As for the albumin, it is important to preserve its whipping properties, and the albumin is therefore always fermented before drying. For whole egg and yolk powder the quality requirements of the relevant market will decide, whether the two products must be fermented before drying. Fermentation processes for albumin, whole egg and yolk are largely identical though with minor differences. The different fermentation methods used for albumin are described in the following. The description conclusively lists a number of points, on which the fermentation of whole egg and yolk differs.



As mentioned formerly, the fermentation serves to remove the glucose in the albumin. Fresh albumin contains only a few hundredths percent of fat, but during storage of shell eggs some part of the yolk fat will extrude and blend with the albumin. Some small parts of yolk may also be found in the albumin after the breaking and add to the fat content in the albumin. The fermentation process also serves to remove this extra fat from the albumin.

To that end a strong foaming is created during the fermentation process causing the fat and other undesirable elements to lodge in the foam and will then be removed together with the layer of foam. In order to get the right intensity of foaming up, the fermentation tanks must comply with very specific dimensioning standards. The fermentation is a biological process, which can be split up in three groups depending on whether yeast, bacterial or enzyme fermentation is used.



Pre-treatment of whole egg and yolk

The pre-treatment of whole egg and egg yolk pulp is fairly uncomplicated compared to the pre-treatment of albumin. After breaking/separation, the pulp is filtered and pasteurized. In some cases, depending on the final product specification, the pulp may, however, also be homogenized and fermented. For whole egg and yolk the enzymatic process seems the most desirable. The other two processes may give disagreeable odours and flavours in the finished product; presumably because of lipase activity. The pump and filter treatment ensures that the product is homogenous, when it enters the fermentation tanks. For some uses it appears necessary to homogenize whole egg and yolk prior to their fermentation. For this purpose a conventional dairy type homogenizer can be used. The amount of enzyme and hydrogen peroxide added is adjusted according to the amount of glucose contained in whole egg and yolk, respectively.



On adding the hydrogen peroxide the foaming-up should be rather less than with fermentation of albumin. Fermentation time is approximately six hours for whole egg and approximately four hours for yolk. Constant agitation is necessary during the process. When the glucose content has been reduced to the desired level, the product is pasteurized and dried.

The fermentation tanks must be insulated so to ensure a constant temperature throughout the processing period. The agitator must be designed to handle the product gently. A pH unit for automatic checking and adjustment of the pH value is preferable also.

شرکت گوگانی

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طراحی فرآیندهای بیولوژیکی

مشاوره در امور فرآیندهای بیولوژیکی

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