

# ALIEN PROPERTY CUSTODIAN

## EGG YOLK-LIKE PREPARATION

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My invention relates to a new nutritive material and more particularly to a preparation which is similar to egg yolk.

It is an object of my invention to provide for a new foodstuff of the kind of egg yolk.

It is another object of my invention to produce this new preparation from ingredients other than natural egg yolk and more particularly to prepare same with the use of albumin compounds contained in milk.

The following constituents of the substance of the yolk of hen's eggs are of considerable importance for the practical use of egg yolk:

Vitellin, lecithin, cholesterol and the fatty compounds margarin and elain.

Lecithin and cholesterol impart to the protein vitellin the capacity of emulsifying and, similar as the fatty compounds, they cause that the egg yolk can be used to a large extent in the art of baking, which property is substantially due to the fact that the egg yolk is an emulsion-like composition of the substances mentioned.

It has been established by experiments that the protein or albumin called vitellin can be replaced by milk albumin in suitable state. Moreover the egg lecithin may be replaced by vegetable lecithin without the emulsifying properties deteriorating in comparison with the natural composition. Other fats or oils may be employed instead of fatty compounds of the natural yolk and the relation between lecithin and fat occurring in the egg yolk may be altered to a large extent in favor of the lecithin without impairing the qualities which are important for the employment of the product and more particularly for the baking. It is economically of great importance that fat may thus be replaced by lecithin, since lecithin is less expensive than fat and is available in large quantities as a secondary product occurring in the treatment of soy beans.

Moreover, kefir or kefir albumin and more particularly an emulsion of kefir and fat or kefir and oil may be used to a certain extent instead of lecithin.

I thus succeed in composing a substitute for egg yolk from milk albumin, vegetable lecithin and fatty compounds or oils.

The process of preparing this substitute may be carried out in various manners.

The milk albumin or protein may be homogenised immediately in natural or precipitated form and in pure state or together with its natural accompanying substances, such as milk

sugar, fatty bodies and the like, with lecithin. The lecithin may be employed as such alone or dissolved in oil or substances containing fat or in a composition with such substances.

The milk proteins may however also be deaminized, so as to become more similar to the protein of egg yolk. Not only the micellar structure of the milk protein is changed by this conversion, but also the color, which at the pH values characteristic of the substance of egg resembles to luteln.

By emulsifying these deaminized albumins with vegetable lecithin and suitable oils or fats one can obtain a preparation which in physicochemical respect is similar to egg yolk and which may replace the egg yolk in the preparation of food, pastry and paste articles.

The essential properties, to which the applicability of egg yolk owes, for instance its flavor qualities and its specific heat energy as occurring in the physiological combustion, are present to the same extent in the preparations obtained according to my invention from milk protein. By an addition of these new preparations the porosity of the pastries becomes more uniform and the baker's ware more spongy. The baker's wares furthermore remain fresh for a longer time, when the new substances are added to them, in consequence of the fat content of same.

The emulsifying efficacy of the products may further be increased by an addition of mucilages, for instance tragacanth or agar, or of cellulose-like compounds, for instance methyl cellulose. Butter fat or other fats or oils with or without a content of lecithin, may also be used instead of lecithin, if simultaneously methyl cellulose is added as emulsifier.

All the substances mentioned above allow to convert the milk albumin, which otherwise cannot be plainly employed to replace egg yolk in the art of baking, into a product which with respect to the properties important for the art of baking is equivalent to egg yolk. By means of these preparations, similar as by means of egg yolk, there may for instance be produced foamy bodies containing sugar, or creamlike bodies, or mayonnaises.

The following examples illustrate the invention and the manner in which it may be performed without in any way limiting its scope.

*Example 1.*—1000 kgs. precipitated casein with a water content of approximately 65% are thoroughly kneaded in a drum apparatus with 1 kg sodium nitrite or the corresponding quantity of the pickling salt commonly used in butchery; 1.5

kgs. glacial acetic acid, which has priorly been diluted with 10 kgs. water, are gradually added. The mixture thus obtained is allowed to rest during several hours and is thereupon washed with acidified water.

To the product thus obtained alkalies, for instance ammonia, are added in a quantity required in order to cause the product to swell and subsequently to dissolve it. A pH value of above 7 is obtained therein.

This solution is thereupon homogenised at suitable temperatures with 85 kgs. vegetable lecithin, which has been dissolved in 290 kgs. vegetable oil.

The emulsion thus obtained may be dried, for instance by spraying it.

It has been found that already a starting phase of the emulsion, viz. the de-aminized protein, can be used as a substitute of egg yolk, for instance in the production of paste articles. It is also possible to replace in the production of the new preparations the whole or part of the volatile alkali by solid alkalies, especially by alkaline calcium compounds. By the use for instance of calcium hydroxide (calcium oxydatum hydricum) a preparation is obtained which is very similar to natural egg yolk.

*Example 2.*—1000 kgs. precipitated casein with a content of about 65% water are treated with that quantity of alkali, for instance ammonia, which is necessary for causing the casein to swell and to be thereupon dissolved, wherein a pH value of more than 7 is obtained. The solution thus produced is homogenised thereupon with 85 kgs. vegetable lecithin, dissolved in 290 kgs. vege-

table oil, at a temperature at which the solidified lecithin is liquefied, thus for instance at about 40° C. The emulsion thus prepared may be colored in any known manner, for instance by an addition of a suitable dyestuff, and may then be dried by an atomizing process.

As has been mentioned above, milk with its content of cream or skimmed milk may be used instead of casein. The proportion of quantities is calculated in this case in accordance with the content in casein.

10,000 kgs. skimmed milk would for instance be required in the example given above, provided that the skimmed milk contains 3.5% casein. The skimmed milk is preferably thickened according to any known method to at least the fourth or a still smaller part of its volume and then treated according to my process described above. Milk which has not been skimmed may be treated in a corresponding manner.

Wholesome alkaline earth compounds, such as basic calcium compounds, may be used instead of the alkalies mentioned above for the swelling and dissolving treatment described.

Other fats, such as butter fat, may likewise be used instead of vegetable oil.

The lecithin may wholly or partly be replaced by substances, such as mucilage, with emulsifying capacity.

Various changes may be made in the details disclosed in the foregoing specification without departing from the invention or sacrificing the advantages thereof.

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