Uses of Frozen and Dried Egg

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Frozen egg and dried egg are used mainly by processors of other food products. The baking industry, by far the largest user of them, takes as much as 7 percent of the country's total egg supply in some years. Large quantities also go into mayonnaise, noodles, ice cream, and candy.

Frozen egg and dried egg have certain advantages over shell eggs and liquid egg for manufacturing use, especially in large-scale production. Shell eggs are bulky, fragile, and perishable except under good storage conditions. When frozen or dried, they provide the manufacturer with a more uniform product, which is compact and may be held with much less deterioration. Care in defrosting and in reconstituting is necessary to bring about the best qualities in the processed egg.

The properties of egg white and egg yolk that make them of value in household cookery are largely retained in the frozen and dried products. Frozen whole egg and egg white have all the qualities of shell eggs for leavening, thickening, and emulsification when used in bakery products. They also give flavor and color to cakes and other baked goods.

The baker uses frozen whole egg in making doughnuts, sweet doughs, jelly bases, cookies, pastries, and cakes. The frozen product sometimes gives a greater volume in pound cakes than the natural one, probably because of the variation in quality of shell eggs. Frozen egg is also used as a thickening agent in pie fillings and custards.

Because of its leavening ability and color, frozen egg white is used to give a smooth, light texture to some kinds of cake. Thin egg white when frozen compares well with fresh shell eggs in making angel-food cakes. Cakes made from frozen thick white are not quite so desirable in quality.

Bakers use frozen and dried egg white for meringues and cream icings. Many hold that fermented dried egg white gives foam of better volume and quality than the unfermented. Several tests for evaluating the whipping quality of dried egg white have been devised.

Frozen and dried egg yolk is used in doughnuts, gold cakes, and other bakery products to give color and to aid emulsification of shortening materials. Bakers use frozen egg yolk containing 10 percent sugar because it has a better consistency and is freer from flecks than yolk frozen without the addition of sugar. They sometimes use frozen yolk containing 5 percent glycerin to help in retaining the moisture and thus keep their products fresh.

Noodles are prepared from dough made from semolina, or hard-wheat flour, containing egg yolk or whole egg and rolled and cut into strips, which are dried. Other flours may be used, but finished noodles must have, by standard, less than 13 percent moisture and more than 5½ percent egg solids. About 11 pounds of egg yolk, containing 45 percent solids, is necessary for each 100 pounds of flour of a 14 percent moisture content to give noodles the legally required amount of egg solids.

Noodles are now made by a continuous process, not by batches. Frozen egg yolk or frozen whole egg is the
principal source of eggs; dried egg and shell eggs are used to some extent. Because no artificial coloring agent is permitted to give the noodles a rich tint, eggs with dark yolks are preferred.

The nutritional value of noodles can be improved by adding vitamins, as is done with white flour. The enrichment levels established by the Food and Drug Administration in 1945 require that each pound of noodles contain between 4 and 5 milligrams of thiamine (vitamin B₁), 1.7 to 2.2 milligrams of riboflavin (vitamin B₂), 27 to 37 milligrams of niacin, and 13 to 16½ milligrams of iron.

In the continuous process, the powdered vitamins and iron are delivered by a mechanical feeder as a ribbon into the flour mixer. In the batch process, wafers of the enrichment material are added to part of the water used in making the dough.

Mayonnaise is a semisolid emulsion of edible vegetable oil, the egg yolk or whole egg, vinegar or lemon juice, sugar, and seasoning. The finished product contains not less than 50 percent of edible vegetable oil. Eggs are prepared in various ways for mayonnaise. Most commonly used is the salted form of frozen egg yolk. Next in order are the frozen sugared, fresh refrigerated, specially treated, and dried egg yolk. From 8 to 12 percent of egg is generally used. The mayonnaise manufacturer is especially interested in obtaining egg yolk of uniform quality and dark color.

Mayonnaise, an emulsion stabilized by the egg material, is one of the most fragile of the commercially prepared food products now made. Because of its unstable nature, special care must be given to the various products used in its manufacture and to many details of preparation and distribution.

Manufacturers of ice cream use frozen whole egg, frozen yolk, and frozen sugared yolk. Their choice depends largely on cost. Egg yolk, used up to 1 percent of the mix, increases the whipping properties of the mix and shortens the freezing time of the batch. The smoothness of the ice cream is improved and its color is enhanced by reducing the size of the ice crystals. French ice cream and frozen custards always contain egg yolk. Many States have regulations that 2½ dozen fresh yolks or ¾ pound of dried yolk or 1½ pounds of frozen yolk be used in each 90-pound batch of frozen custard. Egg albumen is also used in sherbets to give a smooth texture and a richer flavor. Dried egg is used in ice-cream mixes for household use.

Dried egg white is used a great deal in the manufacture of such confections as cream centers, candy bars, nougat, fondant, and divinity fudge. The egg albumen reduces the size of the sugar crystals and prevents their growth after the candy is made. The egg white acts as an interfering substance, or protective colloid, to prevent crystallization. Eggs are used in marshmallows to give smoothness and whiteness. In divinity fudge, an exact measurement of egg white must be used—small amounts make a grainy, crumbly candy; large amounts cause the candy to dry out and become powdery upon standing, even though it was soft and fluffy to start with.

Prepared flour and baking mixes, the use of which is increasing, offer the chief field of expansion for dried-egg products. Dried yolk is used in ready-mixed doughnut, waffle, muffin, and cake flours to give color and richness. Ice-cream powders and mixes use dried white, or albumen, which also is used in some baking powders as an inhibitor or diluent. Dried yolk is used in beverage powders, which provide a quickly prepared, rich drink.

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