

## Safe Handling of Eggs

### SHELL EGG SAFETY

Eggs can be a part of a healthy diet. However, they are perishable just like raw meat, poultry and fish. To be safe, they must be properly stored, handled and cooked.

**Concern for Egg Safety:** Some unbroken fresh shell eggs may contain *Salmonella enteritidis* bacteria that can cause foodborne illness. While the number of eggs affected is quite small, there have been some scattered outbreaks in the last few years. Currently the government, the egg industry and the scientific community are working together to solve the problem.

Researchers say that if present, the *Salmonella enteritidis* bacteria are usually in the yolk or “yellow.” But they cannot rule out the bacteria being in egg whites. So everyone is advised against eating raw or undercooked egg yolks, whites or products that contain eggs.

People with health problems, the very young, the elderly and pregnant women (the risk is to the unborn child) are particularly vulnerable to *Salmonella enteritidis* infections. Chronic illness also weakens the immune system, making the person vulnerable to foodborne illness.

### STORAGE, HANDLING AND COOKING OF SHELL EGGS

Proper refrigeration, cooking and handling should prevent most egg safety problems. People can enjoy eggs and dishes containing eggs if these safe handling guidelines are followed.

**Don't Eat Raw Eggs:** This includes “health food” milk shakes with raw eggs, Caesar salad, hollandaise sauce and any other foods like homemade mayonnaise, ice cream or eggnog made from

recipes in which the raw egg ingredients are not cooked. These egg-based recipes should be updated to start with a cooked base or so that commercially prepared pasteurized eggs or egg substitutes are used. Use a thermometer and make sure the temperature of the cooked base reaches 160 °F.

### Buy Clean Eggs from a Refrigerator Display

**Case:** Do not purchase eggs anywhere that are not refrigerated. Any bacteria present in the egg can grow quickly if stored at room temperature. At the store, choose Grade A or AA eggs with clean, uncracked shells.

**Safe Storage of Eggs at Home:** Take eggs straight home and store them immediately in the refrigerator at 40 °F or slightly below. Store them in the grocery carton in the coldest part of the refrigerator, not in the door. Do not wash eggs. Washing eggs could remove the protective mineral oil coating put on at the plant and could increase the potential for bacteria on the shell to enter the egg.

**Use Eggs Promptly:** Use raw shell eggs within three to five weeks. When fresh eggs are hard cooked, the protective coating is washed away so hard-cooked eggs should be refrigerated within two hours of cooking and used within a week. Use leftover yolks and whites within four days. If eggs crack on the way home from the store, break them into a clean container, cover tightly, and keep refrigerated for use within two days.

**Freeze Eggs for Longer Storage:** Eggs should not be frozen in their shells. To freeze whole eggs, beat yolks and whites together. Egg whites and yolks can also be frozen by themselves. Use frozen eggs within a year. If eggs freeze accidentally in their shells, keep them frozen until needed. Defrost them in refrigerator. Discard any with cracked shells.

**Handle Eggs Safely:** Wash hands, utensils, equipment and work areas with warm, soapy water before and after contact with eggs and egg-rich foods.

**Serve Immediately:** Don't keep eggs — including Easter eggs — out of the refrigerator more than two hours. Serve cooked eggs and egg-rich foods immediately after cooking, or place in shallow containers for quick cooling and refrigerate at once for use within 24 hours. Use within three to four days.

**Cooked Eggs:** Hard-cooked eggs should be safe for everyone to eat. Those at risk for foodborne illness should avoid eating soft-cooked or “runny” eggs. However, healthy persons may choose to eat eggs that are less than totally firm. Use the following cooking times:

*Fried Eggs:* Cook 2 to 3 minutes on each side; 4 minutes in a covered pan. The yolk should begin to thicken.

*Scrambled Eggs:* Cook until firm throughout.

*Poached Eggs:* Cook 5 minutes over boiling water.

*Soft-Cooked Eggs:* Cook 7 minutes in the shell in boiling water.

**Use Safe Egg Recipes:** Egg mixtures are safe if they reach 160 °F, so homemade ice cream and eggnog can be made safely from a cooked base. Heat the egg-milk mixture gently. Use a thermometer or be sure the mixture coats a metal spoon.

Dry meringue shells are safe. So are divinity candy and seven-minute frosting, made by combining hot sugar syrup with beaten egg whites.

Meringue-topped pies should be safe if baked at 350 °F for about 15 minutes. Chiffon pies and fruit whips made with raw, beaten egg whites cannot be guaranteed safe. Substitute whipped cream or whipped topping.

To make key lime pie safely, heat lime (or lemon) juice with raw egg yolks in a pan on the stove, stirring constantly, until the mixture reaches 160 °F. Combine this mixture with sweetened condensed milk and pour it into a baked piecrust. For meringue topping, bake as above.

For egg dishes such as quiche and casseroles, a knife inserted in the center should come out clean.

### **Safety Tips for Easter Eggs:**

- Wash hands before dyeing the eggs.
- Use a food-safe coloring if eggs will be eaten.
- Handle eggs carefully to prevent cracking. If the shells crack, bacteria could contaminate the inside. Do not use cracked eggs for hiding.
- After hard-cooking eggs, dye them and return them to the refrigerator immediately until ready to hide.
- Hide eggs in places protected from dirt, pets and other sources of bacteria.
- The total time for hiding and hunting eggs should not exceed two hours. Discard any Easter eggs that have been cracked. The uncracked “found” eggs should then be refrigerated until eaten.
- Eat hard-cooked eggs within one week.

**Ukrainian Easter Eggs:** A traditional part of the Easter celebration in the Ukraine, these whole, raw eggs have their contents blown out to leave a hollow shell that is then decorated. Because some raw eggs may contain *Salmonella*, use caution when blowing out the contents. Use only uncracked eggs that have been kept refrigerated. To destroy bacteria that may be present on the surface of the egg, wash the egg in hot water and then rinse in a solution of one teaspoon chlorine bleach per half cup of water. After blowing out the egg, refrigerate the contents and use within two to four days; cook thoroughly before eating.

**Pickled Eggs:** Pickled or brined eggs are hard-cooked eggs marinated in vinegar and pickling spices, spicy cider, or juice from pickles or pickled beets. Home-pickled eggs should be kept refrigerated. Unopened containers of commercially processed pickled eggs keep for several months on the shelf. After opening, keep refrigerated.

### **EGG PRODUCTS**

When consumers think of an egg, most picture a pristine white, or sometimes brown, oval shell containing a completely edible, versatile food. But of the 63 billion eggs consumed in 1994, more than 25 percent were in the form of egg products.

The term “egg products” refers to eggs that have been removed from their shells for processing. Basic egg products include whole eggs, whites, yolks and various blends with or without non-egg

ingredients that are processed and pasteurized and may be available in liquid, frozen and dried forms. Egg products are widely used by the food service industry and as ingredients in other foods, such as prepared mayonnaise and ice cream.

### **Buying, Handling and Cooking Egg Products:**

Proper storage and handling is necessary for all egg products to prevent bacterial contamination.

- Buy only pasteurized egg products that bear the USDA inspection mark.
- Make sure containers are tightly sealed. Frozen products should show no signs of thawing. Refrigerated products should be kept at 40 °F or below. Dried egg products should not be caked or hardened.
- Store frozen egg products up to one year at 0 °F or lower. After thawing, do not re-freeze.
- Thaw frozen egg products in the refrigerator or under cold running water. **DO NOT THAW ON THE COUNTER.**
- If the container for liquid products bears a “use by” date, observe it. Follow the storage and handling instructions provided by the manufacturer.
- For liquid products without an expiration date, store unopened containers at 40 °F or below for up to seven days (not to exceed three days after opening). Do not freeze opened cartons of liquid egg products.
- Unopened dried egg products and egg white solids can be stored at room temperature as long as they are kept cool and dry. After opening, store in the refrigerator.
- Reconstituted egg products must be used immediately or refrigerated and used that day.
- USDA Commodity Dried Egg Mix should be stored at less than 50 °F, preferably in the refrigerator. After opening, use within seven to 10 days. Reconstitute only the amount needed at one time and use immediately or refrigerate and use within an hour.

## **EGG PRODUCT SAFETY**

**Who Inspects Egg Products?:** Congress passed the Egg Products Inspection Act (EPIA) in 1970. The EPIA provides for the mandatory continuous inspection of the processing of liquid, frozen and

dried egg products to ensure they are wholesome and properly labeled and packaged to protect the health and welfare of consumers.

USDA’s Food Safety and Inspection Service (FSIS) inspects all egg products, with the exception of those products exempted under the Act that are used by food manufacturers, food service institutions and retail markets. The Department of Health and Human Services’ Food and Drug Administration (FDA) is responsible for the inspection of egg substitutes, imitation eggs and similar products that are exempted from continuous inspection under the EPIA.

Currently, only Canada is exporting egg products to the United States. The EPIA specifies that egg products may not be imported into the United States except from countries that have an egg products inspection system equivalent to that in this country.

**Why Are Eggs Products Useful?:** Food manufacturers like pasteurized egg products because of their convenience and ease in handling and storing. Institutional food service operators, such as fast food chains, restaurants, hospitals and nursing homes, use egg products to ensure a high level of food safety. Consumers are starting to see more egg products in retail food stores.

**How Are Egg Products Made?:** Egg products are processed in sanitary facilities under continuous inspection by the USDA. The initial step in making egg products is breaking the eggs and separating the yolks and whites from the shells. Eggs are processed by automated equipment that moves the eggs from flats, washes and sanitizes the shells, breaks the eggs and separates the whites and yolks, and/or makes mixtures of them. The liquid egg product is filtered, mixed, and then chilled prior to additional processing.

**Why and How Are Egg Products Pasteurized?:** The law requires that all egg products distributed for consumption be pasteurized. This means that they must be rapidly heated and held at a minimum required temperature for a specified time. This destroys salmonella, but it does not cook the eggs or affect their color, flavor, nutritional value or use. Dried whites are pasteurized by heating in the dried form, again for a specified time and at a minimum required temperature.

Since many new and different types of egg products are now being formulated, government and industry researchers are currently evaluating the effectiveness of the pasteurization processes used for these and other products. Additional research will determine if new safety measures are needed to continue to provide safe egg products for food service, industry and consumers.

**Are All Egg Products Pasteurized?:** Certain commodities are not presently considered egg products and are exempt from this law. These commodities include freeze-dried products, imitation egg products and egg substitutes. Inspected, pasteurized egg products are used to make these commodities and companies may elect to re-pasteurize these products following formulation and before packaging. Officially inspected egg products will bear the USDA inspection mark.

No-cholesterol frozen egg substitutes first became available to consumers in 1973. They consist of egg whites, artificial color and other non-egg additives. Specific questions about egg substitutes should be directed to the manufacturer.

**What Information is Provided on Egg Product Labels?:** In addition to nutrition information on consumer packages, other labeling information is required for egg products. All egg products must be labeled with: (a) the common or usual name; (b) the ingredients listed in the order of descending proportions; (c) the name and address of the packer or distributor; (d) the date of pack which may be shown as a lot number or production code number; (e) the net contents; and (f) the official USDA inspection mark and plant number.

**Can Egg Products Be Used as an Ingredient in Uncooked Foods?:** Egg products can be used in baking or cooking (scrambled eggs, for example). They have been pasteurized, but for optimal safety are best used in a cooked product. Consumers should be sure that the internal temperature of the cooked products reaches 160 °F. The USDA does not recommend eating uncooked, fresh, shell eggs due to the possibility that salmonella bacteria may

be present. Some recipes are typically made with raw eggs that won't be cooked to 160 °F, and egg products can be substituted in these recipes. It is always best to start with a cooked base, especially if serving high-risk persons such as the elderly, children, the chronically ill, or those with weakened immune systems.

**What is Dried Egg Mix?:** USDA Dried Egg Mix was first developed for the military during the 1930s. It is a blend of dried whole eggs, nonfat dry milk, soybean oil and a small amount of salt. There is very little moisture in it. To reconstitute, blend ¼ cup of Dried Egg Mix with ¼ cup water to make the equivalent of one large whole egg. Dried Egg Mix is packaged in 6-ounce pouches, equivalent to about six eggs each. It is distributed by USDA to food banks, Indian reservations and other needy family outlets and is also used in disaster feeding (for hurricane and flood victims, for example).

A similar product called All-Purpose Egg Mix, containing a greater proportion of eggs, is now being manufactured for USDA. It is reconstituted by mixing one part egg mix with two parts water (by weight). All-Purpose Egg Mix is available to schools as part of the School Lunch Program. It is packaged in 10-pound bags.

Sources:

1. USDA Consumer Publication (1995). *Focus on: Egg Products*. [WWW document].  
URL <http://www.fsis.usda.gov/OA/pubs/eggprod.htm>
2. USDA Consumer Publication (1996). *Eggs and Egg Product Safety* [WWW document].  
URL <http://www.fsis.usda.gov/OA/pubs/ciegg.htm>
3. Food Safety and Inspection Service (1999). *All About Shell Eggs*. [WWW document].  
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