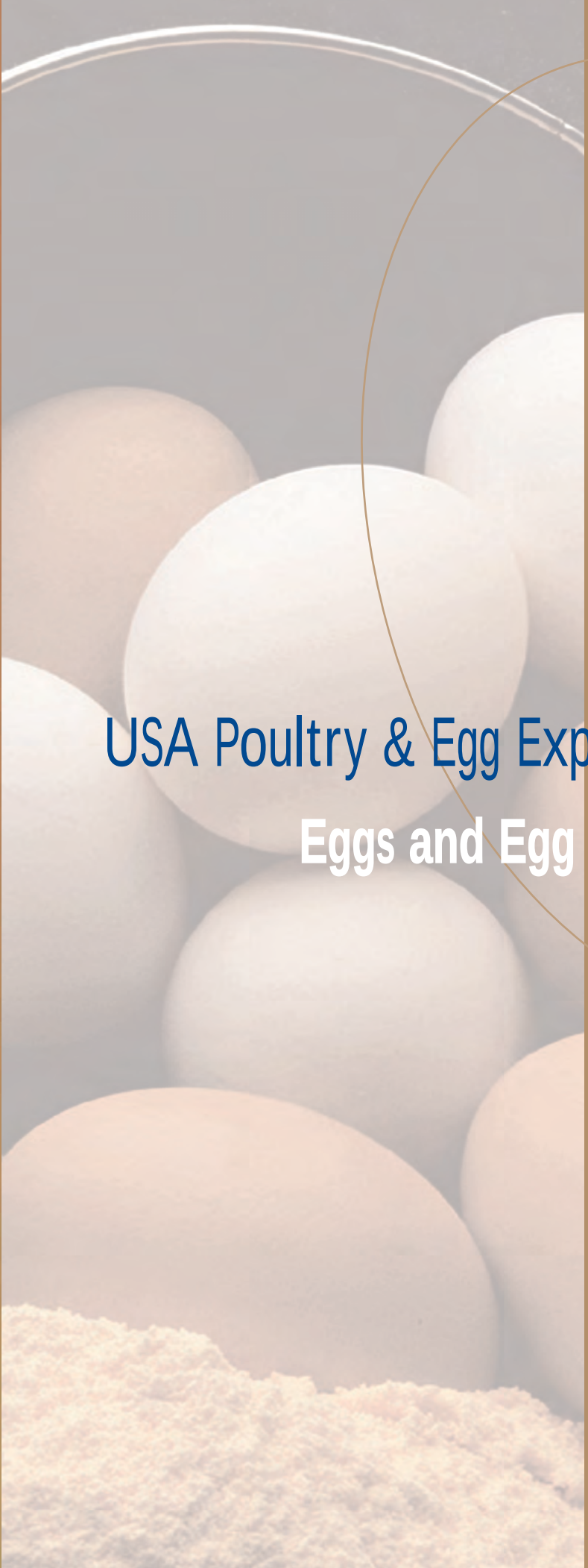

USA Poultry & Egg Export Council

Eggs and Egg Products

BUYER'S GUIDE

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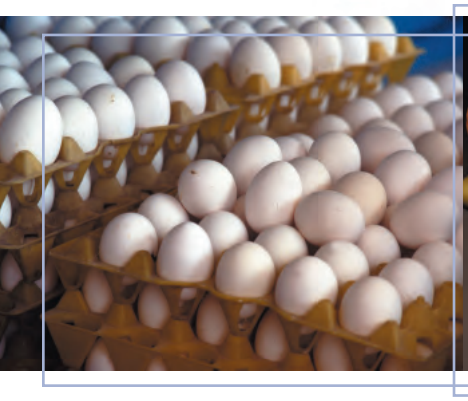


U.S. Eggs: Distinguished Quality, Assured Safety

Egg production is a prominent and vital segment of agriculture in the United States. American egg producers manage more than 280 million (table-egg-type) hens, each of which lays about 275 eggs per year. Of all (table) eggs produced in the U.S., approximately 70% is marketed as shell eggs for home, institutional, and food service use. The remaining 30% is processed into a variety of different egg products to be used by food manufacturers and large food service operations worldwide.

Why U.S. eggs?

- Not only is the U.S. the world's second-largest egg-producing country, it also produces eggs of the highest quality in the world.
- The American egg industry maintains strict quality control and sanitation measures that are more stringent than is required by law. Immediately after they are laid, eggs are washed, sanitized, oiled, graded by the U.S. Department of Agriculture, and packed.
- During processing, U.S. eggs are sprayed with a fine film of odorless, colorless, tasteless mineral oil. Oiling is an important and unique process that seals the pores of the shell to prevent the loss of carbon dioxide and moisture, which prolongs the shelf life of the egg.
- After packing, U.S. eggs are refrigerated throughout the shipping and marketing process.

From Atlanta to Dubai to Hong Kong, buyers know about the "egg-ceptional" qualities of U.S. eggs and egg products. Recent research from the American Heart Association indicates that an egg a day will not increase the risk of heart disease.

This is just the beginning. Studies have now proven that important antioxidants are found in eggs. Lutein and zeaxanthin may reduce the risk of age-related macular degeneration and cataracts, while choline may aid memory and brain development.

As you read through the Egg Buyer's Guide, you can easily see why U.S. eggs rank among the highest in the world for distinguished quality and assured safety.

Shell Eggs

From the time the egg is laid to the time the egg reaches your consumer, a very high standard of quality is maintained.

When eggs enter the processing facility, they are immediately placed on a conveyer belt for washing. Each egg is washed thoroughly with adequate amounts of detergent-sanitizer, and then rinsed. Dirt is removed without damaging the shells or altering the quality. After washing, eggs are also sanitized, oiled, graded, and packed. After the eggs are candled, which is the process of using light to help determine the quality of an egg, they are immediately moved to cooling facilities and ready for distribution.

Shell and yolk color may vary. However, color has no effect on egg quality, nutrition value, or cooking characteristics. Shell color is influenced by the breed of the hen; for example, breeds with white feathers and ear lobes lay white eggs, while breeds with red feathers and ear lobes lay brown eggs. Yolk color is influenced by the hen's diet. Basic U.S. hen egg layer diets are formulated by using yellow corn, vitamins, and soybean meal.

Packaging

Primary packaging is on plastic or fiber flats that hold 30 eggs. Filled trays are then packed into cases that hold 360 eggs. A 30 dozen capacity case size is universal throughout the industry and is used to transport and store shell eggs.

A typical retail package is formed from pulp or foam to hold 12 shell eggs. The carton controls breakage and prevents the loss of moisture and carbon dioxide. According to the mandatory federal labeling requirements, each carton must include the name and address of the packer or distributor, the net contents, identity of the product, nutritional labeling, and safe handling instructions. Each egg carton with the USDA grade shield must also display the pack date, which is the day that the eggs are washed, graded, and placed in the carton. The pack date, also known as the Julian date, is a three-digit code that represents the consecutive day of the year starting with January 1 as 001 and ending with December 31 as 365.

Buying

Look for eggs with shells that are clean and unbroken. Buy USDA Grade A or AA shell eggs from refrigerated cases. Do not buy eggs having shells that are dirty, cracked or leaking. Do not buy eggs that are being stored at room temperature. Buy eggs before the Expiration (EXP) or the "Sell-By" date. The EXP date, however, is not federally required.

Storing

Eggs should never remain out of refrigeration for more than one hour. Store eggs in their carton, large end up, on an inside shelf of the refrigerator. The carton helps to keep the eggs from picking up odors and flavors from the other foods. Also, the carton helps prevent moisture loss. Keep eggs refrigerated between 35° to 45°F (2° to 7°C) until they are to be used. Properly handled and stored eggs rarely spoil. USDA requires eggs to be stored at 45°F (7°C) or lower after processing. Recommended long-term storage is 30°F (-1.10°C).

Cooking

Cook eggs properly. Cook until the white is set and the yolk begins to thicken. The white coagulates at a temperature between 140°F (60°C) and 148°F (65°C). Yolk coagulates between 148°F (65°C) and 158°F (70°C).

SUGGESTED COOKING TIMES FOR EGGS (In Minutes)

Scrambled	250¡ F (121¡C)	1 min.
Poached	Boiling water	5 min.
Sunnyside	250¡ F (cover pan) (121¡C)	4 min.
Over easy	250¡ F (121¡C)	3 min. side 1 2 min. side 2
Soft cooked	Boiling water	7 min.

Time and temperature are critical factors in the cooking and service process. Cool at a low to medium temperature, time carefully. Hold cold egg dishes below 40¡F (5¡C) and hot egg dishes above 140¡F (60¡C). Never leave egg dishes at room temperature for

USDA Grading

U.S. Department of Agriculture standards are used throughout the industry to classify shell eggs into three consumer grades: USDA Grade AA, USDA Grade A and USDA Grade B. Grade does not describe food value; it is a measure of quality.

The grading process examines both the exterior and interior of the egg. Shells are inspected for cleanliness, strength, shape and texture. USDA Grade AA and USDA Grade A eggs have shells that are clean, smooth and sound.

Interior inspection is by candling or breakout. During candling, eggs travel along a conveyor belt and pass over a light source where the defects become visible. Defective eggs are removed. Hand candling or holding a shell egg directly in front of a light source is done to spot check and determine accuracy in grading. USDA Grade AA and USDA Grade A eggs have a very shallow air cell: clear, firm albumen and distinct firm yolks. Discoloration, blemishes, spots or floating bodies inside the eggs result in down grading. Breakout grading is based on a measurement known as the Haugh Unit System. Eggs are broken onto a flat surface for the albumen to be measured by micrometer. Eggs with thick albumen generally grade highest.

Size classifications of shell eggs show egg weight in ounces per dozen. Size has no effect on quality; eggs of any size may be included in each quality grade. The size and weight classifications are shown in the charts on the next page.

The USDA Grade mark, in the form of a shield printed on the carton, certifies that the eggs have been graded for quality and sorted for size.

USDA Inspection

The Egg Products Inspection Act, administered by the U.S. Department of Agriculture, places specific inspection requirements on both shell eggs and egg products. Companies that pack, ship, process or market eggs or egg products operate under close government supervision. In order for shell eggs to be eligible for an official USDA grade stamp, they must be graded by a plant grader and then certified by a USDA grader.

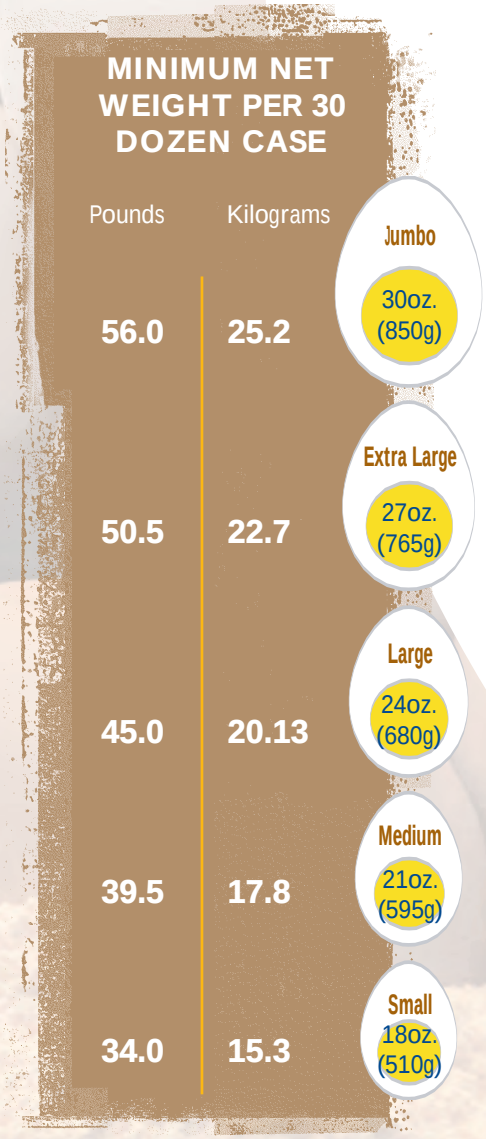
Export Packing

Fiber flats or trays hold 30 eggs. Filled flats are packed into cases that hold 360 eggs. The W-5-C used to be the premier export case; however, now the U.S. industry is moving toward 200-lb. (91 kg) test cases for small eggs, and 275-lb. (125 kg) test cases for medium and larger eggs. These cases are fitted with liners and conform to U.S. specifications for egg export shipments. The case top and bottom is sealed with reinforced gum tape.

Shipment

Eggs are shipped either by refrigerated trucks or aboard ocean vessels, in refrigerated ocean containers. The number of cases that can be shipped in a container or trailer truck is limited due to road weight restrictions in the United States.

The carrying temperature in an ocean container is normally set at 38°F (3.36°C).



The following shows the maximum number of cases by size that can be stowed in a 40-foot (12-meter) ocean container.

Size	Number of Cases
Extra Large	756
Large	800
Medium	880
Small	903

There are few 20-foot (6-meter) containers still in use in the trade today, stowing 300 (108,000 eggs) cases.

U.S./EUROPEAN UNION SHELL EGG WEIGHT COMPARISON
(28.35 GRAMS EQUAL 1 OUNCE)

U.S. Export	EU	Grams/Egg
Jumbo	—	—
XL	XL	>73g (7.3 kg per 100 eggs)
L	L	63-73g (6.4 kg per 100 eggs)
M	M	53-63g (5.4 kg per 100 eggs)
S	S	<53g (4.5 kg per 100 eggs)

Processed Eggs

Of the nearly 78 billion eggs consumed in 2009, more than 30% were in the form of egg products. Eggs removed from their shells are often referred to as egg products. Processed eggs are available in liquid, frozen, dried and cooked forms and are widely used by the foodservice and commercial food industries.

Food manufacturers and foodservice operators use egg products because of their convenience, labor savings, product quality, ease of storage and portion control, stability, and uniformity, and food safety/hygiene. They can be scrambled, made into omelets, or even be used as ingredients in mayonnaise, ice cream, and many other products.

Egg products are processed in sanitary facilities under the constant supervision of USDA. The first step in making egg products is breaking the eggs and separating the yolks, whites, and shells. Sophisticated egg-breaking equipment can break as many as 144,000 eggs per hour, which is equivalent to 400 30-dozen cases, or 40 eggs each second. The separated whites and yolks are individually examined by the machine operator. Unacceptable eggs are not processed for human consumption.

After breaking, the liquid egg product is then filtered, mixed, and chilled prior to additional processing. The final step, which is required by law, is pasteurization. During pasteurization, the egg is rapidly heated. The time and temperature for effective pasteurization depend on the type of product. The egg is not cooked by pasteurization, which has no effect on the color, flavor, nutritional value, or use of the egg.

The Egg Products Inspection Act (EPIA) was passed by Congress in 1970 to provide for the mandatory continuous inspection of the processing of liquid, frozen, and dried egg products. In 1995, the Food Safety and Inspection Service (FSIS) became responsible for the inspection of processed eggs. FSIS inspects all egg products except for egg substitutes, imitation eggs, and freeze-dried products, which are inspected by the Department of Health and Human Services' Food and Drug Administration (FDA). Officially inspected egg products bear the USDA inspection mark.

Federal agriculture officials, or state officials acting on behalf of USDA, visit egg packers and hatcheries at least every three months to see that they are in compliance with the law. Companies that transport, ship, or receive shell eggs and egg products may also be checked periodically. Facilities that break, dry, and process shell eggs into liquid, frozen, or dried egg products must operate under a continuous USDA inspection program with an official inspector present at all times during processing. The law applies to all egg product processing facilities, regardless of size and to those selling products locally, across state lines, and internationally.

Liquid Egg Products

- Whole eggs, whites or yolks
- Sugar egg yolks
- Salted whole eggs or yolks
- Scrambled egg mix
- Enzyme modified products
- Extended shelf life whole eggs, whites, yolks or scrambled egg mix

USAGE	Foodservice and the commercial food processing industry such as bakery and confectionary.
AVAILABILITY	Bulk tank trucks, totes, metal or plastic containers, polyethylene coated fiber or laminated foil and paper cartons and hermetically sealed polyethylene bags. Container size from small bags to cartons (8 oz or 236 ml to 5 lbs or 2 kg), intermediate size bag in boxes and pails (20 to 40 lbs or 9 to 18 kg) and larger drums and totes (200 to 3,500 lbs or 91 kg to 2 tonnes)
ADVANTAGES	Pasteurized, quick and easy to use. Food safety and hygiene.
STORAGE/HANDLING	Store according to processor s recommendations. Normally should be used within six days, except for extended shelf life products for which the supplier s recommendations should be followed.

Dried Egg Products

- Whole eggs or yolk solids
- Dried egg or scrambled egg mix
- Egg whites
- Instant, spray-dried, pan-dried, high-whip or high-gel
- Free flowing whole eggs or yolk solids
- Stabilized (glucose-free) whole eggs or yolk solids
- Blends of whole eggs and/or yolk with carbohydrates
- Enzyme modified products

USAGE	Foodservice and the commerical food processing industry such as bakery, confectionary, mayonnaise, pasta, pre-mixes and meat-binding.
AVAILABILITY	Foodservice 6 oz (170 g) pouches, 3 and 25 lb (1 kg and 11 kg) poly packs. Commercial 25 and 50 lb (11 kg and 23 kg) boxes, 150 (68 kg), 175 (79 kg), and 200 lb (91 kg) drums.
ADVANTAGES	Long shelf life, stable and mixable. Food safety and hygiene.
STORAGE/HANDLING	Keep in dry storage away from extreme temperatures and strong odors. Use pallets.

Frozen Egg Products

NOTE
Yolk products often have salt, sugar or corn syrup added to prevent increased viscosity during freezing.

- Whole eggs, whites or yolks
- Scrambled egg mix
- Salted whole eggs or yolks
- Sugar egg yolks
- Whole eggs yolks with corn syrup
- Whole eggs with citric acid
- Whole eggs with corn syrup
- Enzyme modified products

USAGE	Foodservice and the commerical food processing industry such as bakery and confectionary.
AVAILABILITY	30 lb (14 kg) container and 4 (1.8 kg), 5 (2.3 kg), 8 (3.6 kg), 10 lb (4.5 kg) pouches or waxed plastic cartons. Commercial 25 and 50 lb (11 kg and 23 kg) boxes, 150 (68 kg), 175 (79 kg), and 200 lb (91 kg) drums.
ADVANTAGES	Long shelf life, functionality, variety of blends. Food safety and hygiene.
STORAGE/HANDLING	Keep frozen at below 10¡F (-12¡C). Thaw in refrigerator or set in cold running water. Use as soon as possible.

Cooked Egg Products

- Hard cooked eggs — dry and brine pack
- Diced egg
- Egg patties
- Pre-cooked scrambled egg
- Quiches
- Omelets
- French toast

USAGE	Foodservice and the commerical food processing industry such as catering and institutional.
AVAILABILITY	Portion controlled packaging in various weights, sizes and unit case counts. All products are made with fresh shell eggs that are fully cooked and individually quick frozen to ensure freshness.
ADVANTAGES	All products are food safe, consistent in taste and appearance, and reduce labor. Cooked egg products ensure value and customer satisfaction. Simply heat and serve, with little mess.
STORAGE/HANDLING	Store hard cooked eggs at recommended refrigerated temperatures. Frozen items to be kept at frozen temperatures below 10¡ F. (-12¡ C). Thaw in refrigerator. Use as soon as possible.

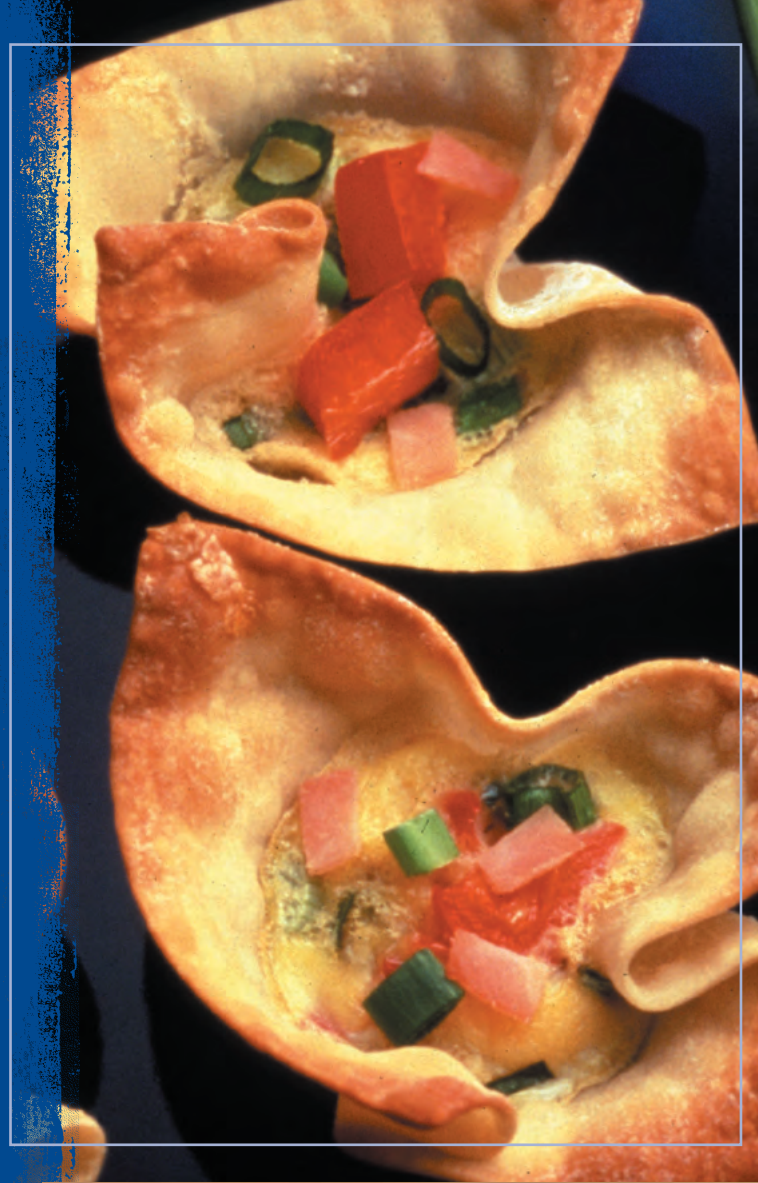





Specifications

U.S. egg products contain food processing specifications, which generally include type of product, packaging, USDA inspection, and various lab analyses for physical, bacteriological, and chemical information. For a few egg products, there are typical USDA specifications or you can obtain exact egg product specifications from your supplier.

Egg product suppliers will work with food manufacturers to meet their special needs. Other ingredients may be added to egg products to complement its functional properties such as carbohydrates to whole egg and yolk products used in baked goods, salt to frozen yolks used in mayonnaise and salad dressings, or skim milk solids and vegetable oils to scrambled egg mixes. You can obtain the specifications for such blends from your U.S. egg product supplier.



Specialty Egg Products

Chopped hard-cooked, peeled eggs — cryogenically frozen and used by salad bars in restaurants.

Whole hard-cooked, peeled eggs — plain, usually packed in a citric acid solution with sodium benzoate, or pickled in pickling solution.

Ultra-pasteurized — pasteurized liquid egg aseptically packaged for extended refrigerated shelf life.

Cafe-Free, Kosher, Halal, or Organic Products

Frozen scrambled egg mix — can be in boilable pouch.

USA Poultry & Egg Export Council

This Buyer's Guide to Eggs and Egg Products is made available courtesy of the USA Poultry & Egg Export Council and the American Egg Board. An effort has been made to describe all the food products processed and sold by the United States egg industry. However, due to the independent structure of the industry, not all products, nor the array of product shapes, sizes and weights that may be available have been described.

Questions concerning specific products or the supply sources for all eggs and egg products should be directed to the USA Poultry & Egg Export Council offices at the addresses shown on this page.

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