

Raw (Headless) Shrimp

PRODUCT DESCRIPTION: This 'Quality Code' can be applied to the vast array of shrimp species marketed in a raw, headless form. Although, this description is primarily based on the dominant Penaeid species produced in the southeast, it outlines quality attributes common to most shrimp. Differences in species color, size, taste and texture should be discussed with individual firms. These differences are usually subtle, especially when cooked, and firms rarely mix species per saleable unit.

PRODUCTION: Shrimp are fished with trawls, which are open mesh nets towed along the bottom in fairly shallow waters near shore. Considering the habitat and habits of shrimp, trawling is most effective, but some estimates have indicated one gallon of diesel fuel is required to harvest one pound of shrimp. This production cost, plus demand and competition for the resource makes shrimp the most valuable fishery in the United States.

Domestic production from Texas through North Carolina is year around, but prices can be influenced by regional availability. For example, the largest production of U.S. white shrimp (*Penaeus setiferus*) occurs in summer and fall along the Louisiana coast. The pink shrimp (*P. duorarum*) is primarily a southwest Florida fishery most active in winter. The largest Penaeid fishery, brown shrimp (*P. aztecus*) is most productive along the Florida panhandle through Texas during summer and fall. This general seasonal pattern does not preclude availability throughout the southeast, North Carolina to Texas.

PRODUCT TYPES: Penaeid shrimp are sold fresh or frozen, but a larger portion of shrimp are sold frozen. Proper freezing and careful thawing and refreezing does not compromise shrimp quality. The edible, shrimp muscle tissues retain their texture, color and flavor such that properly frozen and thawed shrimp can be indistinguishable from fresh shrimp. Poor quality usually denotes poor quality prior to freezing, improper freezing and/or damage due to improper thawing.

PRODUCT FORMS: This SFA Code primarily focuses on the quality attributes for **raw, headless shrimp**, or tails with the shell intact. Other forms such as peeled also known as (shell removed), deveined, split, and pieces can result from further processing.

YIELDS:

*Average Percent Yield from Heads-on Weight

Whole, heads-on shrimp	100%
Headless	62-64%
Headless and peeled	49%
Headless, peeled and deveined	48%

Source (Reference 1); *Average for all species

SIZE GRADES: Shrimp are customarily sold by the count or number of individual headless, shell-on shrimp per pound. Buyers should *not* order shrimp by descriptive names, i.e., jumbo, large, medium. Ordering by counts is more precise and understandable. Any count or size mix can be ordered, but common commercial counts begin in units of five counts. The listed counts are most common for the packinghouse or dockside Processor counts can also include 36-42's, 43-50's, 51-60's, etc.

Common Commercial Counts (number of headless, shell-on shrimp/pound)*

Under 10	31-35	56-60
10-15	36-40	61-70
16-20	* 41-45	71-80
21-25	46-50	81-100
26-30	* 51-55	Over 100

* Commercial grades for 41-50's and 51-60's are also common.

Note peeling and/or deveining would alter these counts. Specified size grades for peeled and deveined forms (p & d) should list the actual counts as in the p & d form or reference the "made from" counts of the initial headless, shell-on forms.

QUALITY ATTRIBUTES: Shrimp should be processed in accordance with the existing "Good Manufacturing Practices," GMP's specified by the U.S. Food and Drug Administration (reference 2). Additional quality attributes are recommended by the National Marine Fisheries Service (reference 3) and the International Codex Alimentarius Commission (reference 4). SFA's Code is equivalent, and in some instances more stringent than these regulations and recommendations.

Color variation per species will depend on shrimp shell color as influenced by age (size), harvest season and location, diet, etc. White shrimp come in varying shades of grayish-white and aqua with tints of green, blue and red. Brown shrimp can be reddish to grey-brown with occasional blue-purple hues. Pink shrimp vary from light to rose pink and can darken to resemble light brown shrimp. Red to rose colored shells are typical for royal-red shrimp and other deepwater and cold water species. Despite this variation in shell color, the basic entire meat color is white.

Discolorations may indicate improper handling and poor quality. Excessive yellowing or orange-reddish tints can result from thermal abuse and exposure. Prolonged handling may impart a bleached appearance. **Blackspot** is the most common discoloration. This reaction is called **melanosis** appearing as blackened strips between the shell segments. This reaction is *not* caused by bacterial growth, it does *not* pose any health hazard, and it may *not* denote spoilage.

Blackspot (melanosis) is primarily an aesthetic concern resulting from natural chemical reactions uniquely related to the shell and molting cycle for shrimp and other crustaceans. It begins to occur first on the shell, and if allowed to progress will taint the surface of the meat. Blackspot can be controlled, thus an excessive amount should not be present. The SFA Code recommends a **top quality package of shrimp should not exceed 5% obvious blackspot** measured by weight of the individual discolored shrimp per pack, Blackspot can exceed this top quality designation and still represent an acceptable product relative to the intended use, but if blackspot has progressed such that it also discolors the underlying shrimp meat, this is considered excessive and probably unacceptable.

Flavor and Odor are best described as mild, pleasant shrimp. Spoiled shrimp begin to emit an ammonia smell. An iodine odor or flavor is common for shrimp and will vary per species and harvest location and season. The iodine does not denote spoilage.

Uniformity is a measure of the variation in individual shrimp size within a specified size grade or count. Uniformity is best measured with a comparison of the largest and smallest (individual) shrimp in a package.

Uniformity ratio (UR) = $\frac{\text{Weight of 10\% of the largest}}{\text{Weight of 10\% of the smallest}}$

The SFA Code recommends that a **(UR) typically runs about 1.50**. Higher ratios can still represent an acceptable pack. The UR ratio tends to be larger for higher count (smaller) shrimp. If uniformity is not a major concern, the order can specify "boat-run." Boat-run shrimp can have a determined mixed count, but they are not graded (variable sizes and variable uniformity). Boat-run shrimp are more common in local situations at the packing house or dockside when buying fresh shrimp. Refer to the appendix for UR examples.

Damaged and broken shrimp should not constitute more than **5% by weight** in a package. Obvious damage means a shrimp that is crushed or mutilated. Minor nicks or cuts should not be considered as obvious damage, but a whole, unbroken shrimp should have 5 distinct segments (4 segments if smaller shrimp, greater than 70 count).

Extraneous material, including shrimp heads, loose shell, attached legs (due to improper removal of heads) and other non-harmful debris should not exceed **one instance per pound of shrimp**. There is no allowance for harmful debris, i.e. staple, wood chip, etc.

Dehydration results when shrimp loses excessive water obvious as a chalky appearance on the surface and edge of the shrimp meat. This condition can result due to improper packaging and poor glazing, and/or excessive exposure to frequent freeze-thaw or temperature fluctuations while in frozen storage. Glazing (ice coating) is necessary to protect frozen shrimp from dehydration.

PACKAGING: Shrimp can be packaged in any size unit depending on customer preference, but the buyer should be mindful that the volume and configuration should be suitable for proper thawing. The 5 pound box packed ten boxes to the master carton (1 10/5's) is the most common package. The 5 pound box should not be confused with the smaller 2 kilogram box (approx. 4.4 pounds). Smaller, 2 and 3 pound units are available.

LABELING: Every packaged unit of shrimp should be properly labeled. The intent is to assure each unit can be traced to the original distributor or processor. The labeling format and placement is determined by Federal regulations specified by the U.S. FDA (reference 5). The SFA Code recommends each label should designate:

Name and address of the manufacturer, processor or distributor.

Common name of the product, i.e, brown, pink, white, royal red, etc. shrimp.

Size grade specified by count.

Net Weight (pounds) of the total shrimp contents excluding the weight for glaze and packaging materials. Note, net weight determinations should reference a standard deglazing procedure (appendix), which does not allow complete thaw of the product.

Ingredients, when used, listed in descending order according to the amount (weight) present.

"Caught in the United States" if the shrimp is produced in domestic waters.

SPECIAL NOTE: other forms available on request

Peeled, undeveined (pud) are headless shrimp with the shell removed

Peeled and deveined (p & d) are headless shrimp with the shell and "vein" removed. The "vein" refers to the visible intestinal tract. The tail-fin can remain attached.

Split (butterfly) shrimp are peeled, deveined and cut apart laterally except for a remaining attachment above the tailfin. The final shell segment and tail-fin may or may not be attached.

Pieces may result during handling and processing. Although this form is only a portion of the original shrimp, it represents a wholesome, nutritious selection. Pieces can be ordered by sizes.

REFERENCES:

1. National Marine Fisheries Service Fishery Statistics of the United States (Annual). U.S. Department of Commerce, NOAA, Washington, DC.
2. Code of Federal Regulations. Title 21. Part 110 - Good Manufacturing, Processing, Packaging, or Holding Human Food. (Revised 6/19/86).
3. Code of Federal Regulations. Title 50. Part 265, Subpart A - United States General Standards for Grades of Shrimp.
4. Codex Alimentarius Commission. 1976. Recommended International Standard for Quick-Frozen Shrimps or Prawn. FAO/WHO Food Standards Programs, Rome Italy.
5. Code of Federal Regulations. Title 21. Part 101 - Food Labeling.



Figure 1