Overview

This section describes food safety issues associated with ready-to-eat food that will not be cooked before they are eaten. Common ready-to-eat seafood products include smoked fish, seafood salads, pre-cooked products, surimi, sushi and sashimi. Information on how to select and handle these products to avoid foodborne illness is provided.

Products that may not be fully cooked before they are eaten are often called ready-to-eat or RTE food products. These products can be made from all of the major high protein perishable foods including meat, poultry, dairy and seafood. RTE foods must be refrigerated properly to prevent the growth of harmful bacteria that could cause foodborne illness and they must be handled properly during storage, preparation and serving.

RTE Seafood Products

Examples of RTE seafood products that must be refrigerated and may not be cooked before they are eaten include:

- Sushi or sashimi
- Smoked seafood
- Seafood salads or dips
- Cooked shrimp, crab or lobster meat
- Pasteurized seafood
- Pickled seafood
- Ceviche or raw marinated seafood
- Dried seafood
- Seafood sandwiches

The key to handling these foods safely is to keep them cold and get them home as quickly as possible. Keep these foods refrigerated at 40°F or below, prevent cross-contamination during storage, preparation, and serving and limit the amount of time that they are exposed to room temperature during serving.

Food Safety Issues

Bacteria that can cause food borne illness (pathogens) can be present in raw seafood products and can be introduced into processed foods when they are handled and exposed to the air, unclean hands, insanitary utensils or equipment or raw products and ingredients. In most cases, when sporadic contamination occurs, the initial levels are low. However, if the product is subsequently exposed to temperatures above 40°F for an extended period of time, it is possible for these pathogens to grow to levels that cause illness.

The types of pathogens that can be associated with these products include: **Vibrio** and **Listeria** which can grow well in either temperature abused raw or cooked fish, and **Salmonella**, **Shigella**, **Campylobacter**, **E. coli**, **Staphylococcus**, and **Yersinia**. These microorganisms can grow well in temperature abused cooked seafood or any other high moisture food in which most of the competing natural spoilage microorganisms have been eliminated by the original cooking process.

High Risk Groups Should Avoid RTE Foods

Certain groups of people with pre-existing health conditions should avoid RTE foods because they are likely to be at increased risk for serious complications when exposed to pathogens. High risk individuals include those...
who may have a compromised or weak immune system because of health conditions such as liver disease, cancer, chemotherapy patients, HIV infection, stomach or intestinal problems (decreased stomach acidity), and certain groups such as the elderly, pregnant women and young children. These individuals should use caution and consider whether or not to they should eat RTE foods unless they are cooked properly before consumption.

**Special Advice for Pregnant Women Regarding RTE Foods**

Pregnant women should be especially cautious of RTE foods because of a potential harmful bacterium called *Listeria monocytogenes*. It can be found in refrigerated, ready-to-eat foods including meat, poultry, seafood, and dairy especially unpasteurized milk and foods made with unpasteurized milk. *L. monocytogenes* is unusual because it can grow at refrigerator temperatures where most other pathogens do not. When eaten, it may cause listeriosis, an illness to which pregnant women and their unborn children are very susceptible. During the first trimester of pregnancy, listeriosis can cause miscarriages. As the pregnancy progresses to the third trimester, the mother is more at risk. Listeriosis can also lead to premature labor, the delivery of a low-birth-weight infant, or infant death. The FDA provides the following advice about foods that are most frequently susceptible to contamination by *Listeria monocytogenes*.

Pregnant women should NOT eat the following foods:

- Hot dogs and luncheon meats – unless they’re reheated until steaming hot.
- Soft cheeses like Feta, Brie, and Camembert, “blue-veined cheeses,” or “queso blanco,” “queso fresco,” or Panela – unless they’re made with pasteurized milk.
- Refrigerated pâtés or meat spreads.
- Refrigerated smoked seafood – unless it’s in a cooked dish, such as a casserole. (Refrigerated smoked seafood, such as salmon, trout, whitefish, cod, tuna, or mackerel may be labeled as “nova-style,” “lox,” “kippered,” “smoked,” or “jerky.” These products are found in the refrigerator section or deli counters of grocery stores and deli counters.)
- Raw (unpasteurized) milk or foods that contain unpasteurized milk.

**Resources for Health Educators and Consumers**

**FDA - Special Handling for Ready-to-Eat, Refrigerated Foods: Reducing the Risks of Food borne Listeria.** This resource provides tips on handling RTE refrigerated foods to prevent listeriosis. It also includes a Question and Answer section that covers common questions about at risk groups and what foods to select. [Click here to visit this site](https://www.fda.gov/RetailFoodSafety/General/Your-Risk-For-Listeriosis/).  

**FDA - Food Safety for Moms-to-Be, While You’re Pregnant—Listeria.** A resource for health educators in a Question and Answer format in English and Spanish. [Click here to visit this site](https://www.fda.gov/RetailFoodSafety/General/Your-Risk-For-Listeriosis/).  

**U.S. Food and Drug Administration - Preventing Listeriosis In Pregnant Hispanic Women in the U.S.: Community Educator's Guide To A Serious Foodborne Risk.** This resource is an educational toolkit for healthcare educators to reach Hispanic women with information about this serious foodborne illness risk. [Click here to visit this site](https://www.fda.gov/RetailFoodSafety/General/Your-Risk-For-Listeriosis/).  

**U.S. Food and Drug Administration - Food borne Illness-Causing Organisms in the U.S. - What You Need to Know.** This site provides information on food borne illness in the U.S. and information about the common pathogens that cause it. Available in both English and Spanish. [Click here to visit this site](https://www.fda.gov/RetailFoodSafety/General/Your-Risk-For-Listeriosis/).