



Safe Handling Practices

for Reduced Oxygen Packaging (ROP) Seafood Products



Reduced Oxygen Packaging (ROP) is a method of food packing that slows spoilage and extends shelf life by reducing or eliminating the amount of oxygen inside the package. Vacuum packaging is a type of ROP. Vacuum packaging uses a special sealing process that removes air from the package. This helps maintain freshness but requires specific handling practices for food safety.

ROP is becoming increasingly popular because it extends the shelf life of the food. ROP allows processors to offer seafood products that stay fresh longer with minimal processing. Vacuum packaging offers the advantage of longer shelf life by not only preventing growth of spoilage bacteria but also by limiting oxygen-dependent chemical processes that spoil, age, or discolor the food. When ROP products are refrigerated at 38°F and above, dangerous bacteria such as *Clostridium botulinum* (C. bot.) can grow. *Clostridium botulinum* is a bacteria that produces a deadly toxin.

Seafood products are a known source of the bacteria *Clostridium botulinum*. This bacteria can grow at temperatures as low as 38°F and without oxygen. This is why proper temperature management of ROP seafood products is important. If a ROP seafood product is exposed to moderate temperature abuse (38°F or above), it may look very appealing and fresh but can potentially contain deadly toxin.

Examples of seafood products that are often in ROP include fish (filets, loins and steaks), smoked fish, cooked lobster meat, cooked crab meat, and surimi.

To keep seafood products that are in ROP safe, they must be frozen or stored below 38°F.



What is the Risk to Public Health?

Improper storage and thawing of ROP seafood products create a toxin risk and can harbor *Clostridium botulinum* spores. C. bot. is a naturally occurring spore-forming bacterium that grows best in the absence of oxygen.

Symptoms include muscle weakness, trouble swallowing or speaking, blurred vision, and, in severe cases, paralysis. **According to the FDA, these spores can germinate and produce a deadly toxin in environments as low as 38°F and without oxygen.** If the seafood product is eaten, the toxin can cause a fatal paralytic illness known as botulism.

What can you do to prevent *Clostridium Botulinum*?

- **Proper Storage:** Always follow package instructions. The label will specify whether to store frozen (below 0°F) or refrigerated (below 38°F). Please note that normal refrigeration temperatures are 41°F or below, but for seafood products in ROP, these products must be held below 38°F to prevent C. bot.
- **Refrigerator Limitations:** If your refrigerator cannot maintain below 38°F, you must remove the seafood products from the ROP before refrigeration.
- **Thawing ROP Seafood Products:** Never thaw at room temperature. To thaw properly you can remove the seafood products from the packaging and thaw under refrigeration (41°F or below). If thawing by submerging under cold running water, you must either (1) remove the seafood product from the packaging before thawing, or (2) keep it in the packaging during thawing but remove it immediately once thawed.

Remember: If your refrigerator is above 37°F, the product must be removed from its packaging before thawing. This will ensure that the seafood product is not thawing in an environment without oxygen and will prevent toxins.



AUGUST 2025