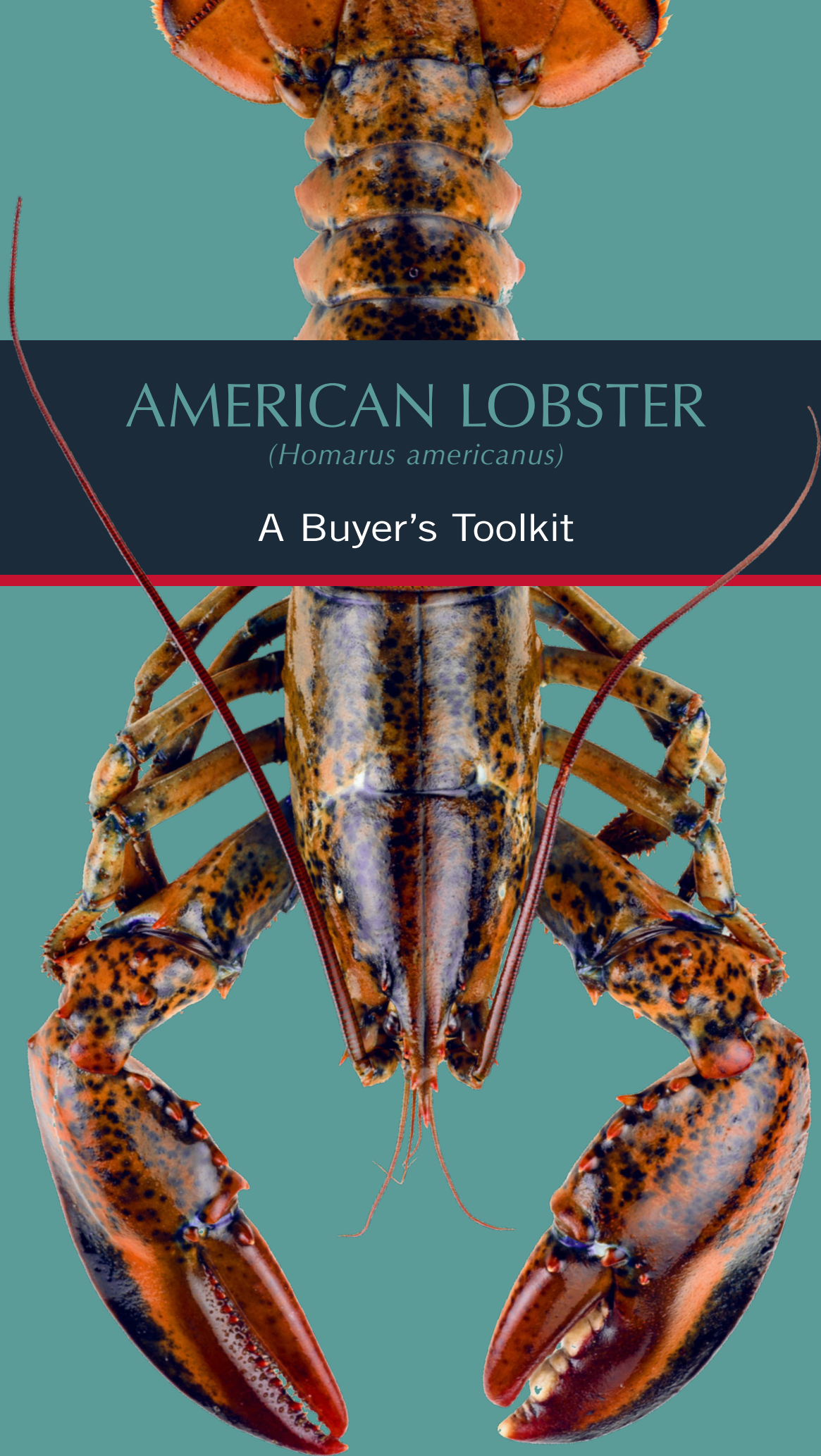




# AMERICAN LOBSTER

*(Homarus americanus)*

A Buyer's Toolkit



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# THE AMERICAN LOBSTER

A brief history



The American Lobster (*Homarus americanus*) accounts for about 55% of the global lobster supply. In US waters, this species' natural range extends from the State of Maine south to the State of North Carolina. Native Americans used lobster as a fertilizer. Plentiful American lobster was fed to prisoners in the 1700s. The cold water American lobster commercial fishery has been in existence since the 1850s. Today, American lobster is a dining delicacy worldwide and the majority of U.S.-harvested lobster is from the waters off Maine and Massachusetts.

The fishery is a year-round effort, but the majority of the catch takes place from May-December of each year. During the winter months there is minimal harvesting and shipping due to high winds, snow, and freezing temperatures.

# U.S. LOBSTER MEANS SUPERIOR VALUE



- American lobster fishery is sustainable and traceable throughout the supply chain
- American lobster is high in protein and has many nutritional benefits
- Processors of American lobster maintain stringent safety standards in holding, processing, transportation, and storage
- American lobster has versatility of application
- American lobster processors offer a full product line in both foodservice and retail
- American lobster is available year-round
- Processed American lobster products are consumer friendly, offer ease of preparation for value-added products, exceptional flavor profiles, and are conveniently packaged
- American lobster processors provide innovative product forms

## SUSTAINABLE RESOURCE MANAGEMENT

Cold water American lobsters are harvested using wire traps. The traps sit on the ocean floor and are attached with a rope and buoy which floats on the ocean surface.

- **Limits on minimum and maximum size of lobster** that can be harvested — typically 8.3 cm - 12.7 cm (3.25 - 5 inches), for smallest size to 12.7 cm (5 inches) to largest size measuring from eye socket of lobster to carapace.
- **Trap limits controlling fishery efforts** — number of traps a fisherman can put in the water
- **Measures to protect egg-bearing female lobsters.** Fishermen cut a v-notch in one of the tail flippers to signify the lobster is a breeding lobster and not to be harvested.
- **Mandates that lobsters must be landed live and whole** — separation of tails and claws from live lobsters aboard lobster boats is prohibited.



# A FISHERY WELL-REGULATED

The American Lobster fishery is sustainable and traceable

Each of the northeast coastal states has its own regulation policies with Maine being the most stringent. There are seven Lobster Conservation Management areas managed intergovernmentally. The fishery is owner-operated with lobsters being caught and measured one lobster at a time. Currently, there are over 7,000 independent harvesters in the US with approximately 5,600 in Maine alone.

- **Gear restrictions** include a limitation on the number of traps that can be fished as well as trap modifications. Escape vents are mandated. These vents must be large enough for undersized lobsters to crawl in and out of the traps. Trap panels are biodegradable and are designed to break apart and let lobsters loose if a trap becomes lost at sea.
- **Monitoring and reporting requirements** — both boat captains and lobster dealers must file catch reports with governmental agencies.



GET TO  
KNOW YOUR  
*Homarus  
americanus*:

Fins

Tail

Body  
(Carapace)

Legs

Knuckles

Claws

## A quick look at AMERICAN LOBSTER

American lobsters are olive green or greenish brown in color with red spines. They have a large body and 10 legs, two of which are large claws. One claw is a crusher claw and the other is a ripper claw.

—**American lobsters commonly reach 200 - 610mm** (8 - 24 inches) and weigh from 450 grams - 4.08kg (1 - 9 lbs.).

—**Typically, it takes 6 - 7 years for a lobster** to reach the 450 grams (1 lb.) size, often growing offshore in depths of up to 2,300 feet.

—**Lobsters molt (shed their exterior shell) in order to grow and form a larger shell.** They do this often — 20-25 times between the time they hatch from eggs and when they reach a legal size to catch at approximately 450 grams (1 lb.).

—**Once mated, the female lobster can produce 5,000 to more than 100,000 eggs.** The larger the female, the more eggs she is capable of producing. These eggs are carried on the underside of the tail for 9 - 11 months.

—**Egg-bearing females move inshore to hatch their eggs** usually in the spring or early summer. The resulting larvae molts four times before settling to the ocean bottom to grow to legal size.

—**Young lobsters often confront predators** — among them fish, sharks, rays, skates, octopus, and crabs.

# NUTRITIONAL VALUE

American lobster is one of the healthiest proteins. An 85g serving (3 oz.) contains only 60 mg of cholesterol, 81 calories and 0.089 grams of saturated fat. American lobster contains zinc (to fight off bacteria and viruses), phosphorus to help with strong bones, vitamin B12 keeping nerve and blood cells healthy, vitamin E (an antioxidant), magnesium required for energy production, and 0.1 grams of Omega-3 fatty acids per serving.

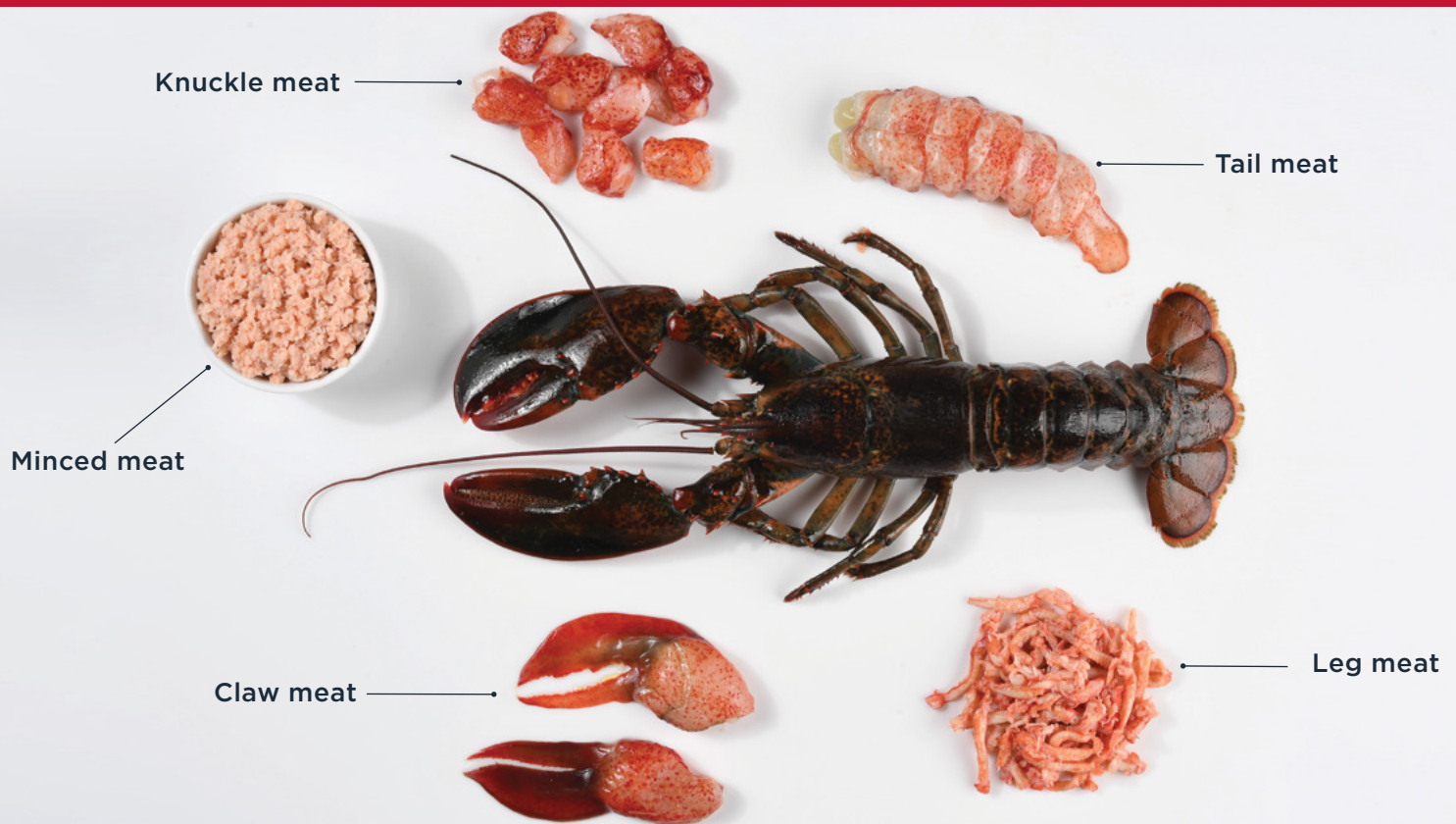


# AMERICAN LOBSTER PRODUCTS





# PROCESSING HISTORY & INNOVATIONS



## LOBSTER PROCESSING

started in the mid-1960s in the US, predominately in Maine. **Whole cooked lobster frozen in brine** as well as **canned lobster meat** were the first product forms. Freezing was primarily done using ammonia in blast and plate freezers, which took 24-48 hours to freeze the products.

Processing expanded and modernized to meet the increased demand for frozen lobster tails and meat. **New freezing methods using liquid nitrogen** extended shelf life and provided ease of preparation — simply defrost, steam and serve. Nitrogen freezing in only eighteen minutes produced a flavorful and tender product with minimal dehydration.

**STEAM COOKING** replaced batch boiling of live lobster. This created a more even and continuous cook and prevented overcooking. Processing facilities adopted detailed food safety plans and more robust food safety standards. As cooking and freezing techniques became more sophisticated, focus shifted more to international markets. The advent of **vacuum packaging** contributed to more attractive and moisture-resistant packaging. Also, the introduction of high-barrier nylon bags protected the meat during cold storage and extended shelf life up to 2 years.

## IN 2006, HPP (HIGH PRESSURE PROCESSING)

was introduced in the lobster industry. Originally used in Spain to extend shelf life of meats, HPP provides a flavorful, consistent, safe, quality lobster product. HPP was also found to extend the shelf-life of cooked lobster products by twenty-one days on average. With HPP processing, the lobster is killed immediately when highly pressurized water is applied. HPP extends value as meat yield is close to 100% and the end user can readily remove lobster meat from the shell. HPP raw claw and knuckle meat has not been previously cooked and lends great versatility to meal preparations and chef applications.

— **Advanced Processing Methods**

Steam cooking produces an even cook. Nitrogen freezing produces high quality products.

— **Modern Product Formats**

Processors offer many different product forms and use of HPP (high pressure processing) products.

— **Superior Taste**

Processing Season: May – December. Most lobster is processed during summer and fall when lobsters are growing into a new shell. The meat quality of these lobsters is more tender and sweeter, with a briny flavor and texture.



# WHY BUY U.S. LOBSTER PRODUCTS



— **Innovative Packaging & Extended Shelf-Life**

Vacuum packaging extends shelf-life and prevents moisture loss. Cooked products have an 18-month shelf-life. Raw product has a 2-year shelf-life.

— **Food safety and consistent quality**

Lobster processors use advanced processing technologies to address animal welfare concerns.

— **Availability**

Frozen processed products are available year-round.








— **Product Versatility**

Value-added lobster meat products using minced lobster meat expand recipe usage. Range of ready-meal retail products (bisque, mac and cheese, pot pies, cakes, dips).

— **Increasing Consumer Demand**

Increased grocery demand for frozen and chilled seafood products. Foodservice counters offer ready-to-use, thawed lobster products.

# AMERICAN LOBSTER COOKED PRODUCT FORMS

Product Description	Size Range	Master Carton Size	Foodservice	Retail
Whole, Cooked	450-794g (1-1.75 lb)	4.54kg		
Cooked, Claw Knuckle	907g/227g (2 lb/8 oz)	5.44kg / 3.63kg		
Cooked Tail Meat	907g (2 lb)	5.44kg		
Minced Lobster Meat	2.27kg (5 lb)	15.88kg		
Leg Meat-Cooked	907g (2 lb)	5.44kg		

**Cooked CTK  
(Claw, Tail & Knuckle)**



**Cooked CK  
(Claw & Knuckle)**



**Cooked  
Whole Tail**



**Cooked  
Split Tails**



**Whole  
Cooked**

**Minced**



# AMERICAN LOBSTER RAW PRODUCT FORMS

Product Description	Size Range	Master Carton Size	Foodservice	Retail
Whole, Raw/Blanched	450-680g (1-1.75 lb)	4.54kg		
Split Raw with Claw	450-567g (1-1.25 lb)	4.54kg		
Split Raw CK in Body	192-220g (6.7-7.7 oz)	4.54kg		
Raw Lobster Tails Whole and Split	56-340g (2-12 oz)	4.54kg / 2.38kg, 2.72kg		
Leg Meat-Raw	907g (2 lb)	5.44kg		
Raw Claw and Knuckle Meat	907g (2 lb)	5.44kg		



Tails

Whole Raw

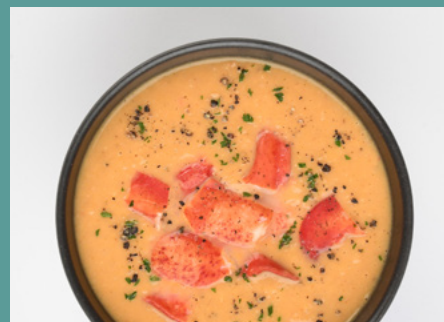
Raw CTK (Claw, Tail & Knuckle)

**CONSUMERS CAN NOW  
HAVE A RESTAURANT  
EXPERIENCE AT HOME  
AT ANY TIME OF DAY.**



## VALUE-ADDED PRODUCTS

Value-added products are trending in grocery stores, specialty food markets, gourmet supermarkets and online retailers. These products use minced lobster meat, leg meat, and body meat as additional ingredients in lobster mac and cheese, lobster risotto, lobster pot pies and cakes, and lobster bisques and chowders. Lobster meals are fully prepared and require only heat and serve or simple assembly. A variety of lobster products are also available in seafood counters and in the freezer section. With innovations and improvements in shipping methods and packaging, both lobster ingredients and ready meals can be shipped to consumers still frozen from e-commerce platforms.



# ON THE MOVE

## Transportation of frozen products



Frozen lobster products are transported to cold storage or directly to customers in refrigerated trucks set at  $-18^{\circ}\text{C}$  or colder. For international transport there are several options:



**By air:** Product is packed in insulated shipping cartons, insulated pallets, or in airline containers with dry ice.



**By sea:** Lobster products are loaded at cold storage into refrigerated container(s) set at  $-18^{\circ}\text{C}$  or colder and then delivered to shipping docks where they are loaded onto container ships for transport.



It is important to be sure required holding temperature is maintained at all times. Many exporters use thermometers to track temperature. **NO PREVIOUSLY FROZEN PRODUCT SHOULD BE REFROZEN.**



# LIVE AMERICAN LOBSTER





**ON BOATS:** As lobsters are removed from the traps and measured, bands are attached to the claws for ease of handling and to prevent damage. Each lobster is handled with care and inspected before being placed into aerated saltwater holding tanks.



**ON LAND:** As lobsters are offloaded from the boat to the buying facility, they are weighed, placed in crates and the crates are floated in aerated saltwater until shipped in refrigerated trucks to tank rooms for further grading into size or shell quality. Live lobster wholesalers monitor the holding tank salinity, aeration, and temperature on a regular basis before shipping.



**IN TRUCKS FOR NATIONAL AND INTERNATIONAL SHIPMENTS:** For international shipments, lobsters are chilled to at least 4.4° C (40° F) before packing. They are then delivered by refrigerated truck to freight forwarders for international air shipments. Live lobsters destined for long distance domestic delivery or international markets are packed tail down and claw up in a slotted shipping carton. After the box is packed, a damp pad is placed on top of the inner box along with frozen gel packs to keep the lobsters cold during transit.

# HANDLING PRACTICES & GRADING

## for live lobster

**HARD-SHELL LOBSTERS** are primarily sold live. They are available year-round worldwide but in limited quantities during the winter months.

**FIRM-SHELL LOBSTERS** are used for both processed and live markets. In the fall and early winter, most in-shell processed product comes from firm-shell lobster.

**NEW-SHELL LOBSTERS** are shipped primarily to processors to convert into lobster meat and lobster tails. The sweet, delicate texture combined with a briny flavor makes these lobsters a favorite of American lobster processors.

### GRADING FOR SIZE:

Name of Lobster Type	Grams	Pounds
Chix	450 - 544g	1 - 1.20 lbs.
Quarters	567 - 658g	1.25 - 1.45 lbs.
Halves	680 - 771g	1.5 - 1.7 lbs.
Selects	794 - 1361g	1.75 - 3 lbs.
Jumbos	1361 - 2722g	3 - 6+ lbs.

### GRADING FOR SHELL QUALITY:

Shell Quality	Time of Year Caught	% of Meat Fill
Hard-shell	January - June	25 - 27%
Firm-shell	October - January	20 - 22%
New-shell	July - September	15 - 17%



# GLOSSARY OF TERMS

**Aerated saltwater:** Process of infusing water with air to allow oxygen exchange and surface release of carbon dioxide and methane gases. Aerated saltwater is used in lobster holding facilities on shore and in holding areas.

## **Atlantic States Marine Fisheries**

**Commission:** American lobster resource and fishery cooperatively managed by ten states and NOAA Fisheries to promote, protect, and sustain Atlantic coastal fisheries resources.

**Brine freezing:** Immersion of lobster products in fast flowing cold brine (solution of sodium chloride) followed by a rinse of refrigerated water. Process freezes products and creates film of water as protectorate from moisture loss. Typically, 24-hour process.

**Carapace:** Hard upper shell of the lobster. The dorsal section of the exoskeleton.

**Ghost Traps:** Traps lost when buoy lines are cut. All lobster traps are required to have biodegradable panels that release to prevent lobsters from being caught in the traps.

**HACCP plan:** Hazard Analysis, Critical Control Points

A preventative approach to food safety, identifying biological, chemical, and physical hazards with corrective actions. Includes food product preparation to packaging and distribution. Process involves conducting hazard analysis, identifying and establishing critical limits, establishing monitoring procedures, corrective actions, validation, verification, and documentation of record keeping. All lobster processors are required to have an HACCP plan in place.

**HPP-High Pressure Processing:** Cold pasteurization technique that uses high level of isostatic pressure transmitted by water to kill the lobster and release meat from the shell. HPP extends shelf life, ensures food safety, and delivers a product that maintains its original texture and flavor. Meat is extracted raw and whole from the shell.

**Larvae:** Immature lobster ready to start feeding

## **Lobster Conservation Management**

**Areas:** Atlantic stock assessment and fisheries management areas. Areas include Inshore Gulf of Maine, Inshore Southern New England, Offshore waters, Inshore Northern Mid-Atlantic, Inshore Southern Mid-Atlantic New York and Connecticut State waters and Outer Cape Cod off Massachusetts. Industry representatives from each management area make recommendations to the Atlantic States Marine Fisheries Commission regarding area management and fisheries plan change. Responsible for minimum/maximum size limits, trap limits, and v-notching of egg-bearing females.

**Molt:** To shed shell to make way for new growth

**Nitrogen freezing:** Flash freezing method using continuous freezing with nitrogen spray with formation of ice crystals. Ensures high quality product with high moisture content.

**NOAA Fisheries:** National Oceanic and Atmospheric Administration, US Department of Commerce providing data, tools, and services supporting safe and efficient transportation and commerce, preparedness and risk reduction of fisheries, stewardship, recreation, and tourism.

**Salinity:** Concentration of dissolved salts in water

## **Sanitation Standard Operating**

**Procedures (SSOPs):** Written documentation of sanitation procedures to maintain sanitary equipment and environment for food processing so that product adulteration does not occur. Process includes cleaning and sanitation procedures regarding frequency, monitoring, record keeping, corrective actions, and confirmation of equipment and chemicals used.

**Steam cooking:** Using steam cooker with continuous belt to cook raw whole lobster, tails, and claw and knuckle meat. Result is an even cook with high quality and adherence to food safety. Product is moist in texture and not overcooked.

**Swimmerets:** Feathery appendages underneath a lobster's tail. The swimmerets help the lobster to swim. The female lobster carries her eggs between the swimmerets.

**Vacuum skin pack:** Seals product on tray using special "skin" film. Extends shelf life of product by removing oxygen and prevents bacteria growth.





## ABOUT US

Food Export USA-Northeast is a nonprofit organization composed of ten northeastern state agricultural promotion agencies that use federal, state and industry resources to help companies increase product sales overseas. Food Export USA-Northeast administers many services through Market Access Program (MAP) funding from the Foreign Agricultural Service (FAS) of the USDA.

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One Penn Center • 1617 JFK Boulevard, Suite 420 • Philadelphia, PA 19103, USA  
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