



AMERICAN OYSTER

(*Crassostrea virginica*)

A Buyer's Toolkit



TABLE OF CONTENTS

Click a topic below to jump to that section

THE AMERICAN OYSTER

- 1. A BRIEF HISTORY**
- 2. SUPERIOR VALUE**
- 3. FLAVOR ATTRIBUTES**
- 4. COMPONENTS OF FLAVOR**
- 5. CULTURED BY HAND**
- 6. FROM HATCHERY TO HARVEST**
- 7. GROWING METHODS**
- 8. CULTURE METHODS INFLUENCE SHELL
SHAPE AND MEAT DENSITY**
- 9. NORTHEASTERN US OYSTER SIZES**
- 10. FOOD SAFETY**
- 11. PRODUCT HANDLING AND TRACEABILITY**
- 12. NUTRITIONAL VALUE**



OYSTERS FROM THE NORTHEASTERN USA

A brief history



The American oyster, also known as the Eastern oyster (*Crassostrea virginica*), has a natural range extending from Atlantic Canada south to the Gulf of Mexico. This highly adaptable shellfish species can tolerate a wide range of temperatures, salinities, and growing conditions. This oyster species can survive day-long exposure to hot sun and winter exposure to freezing temperatures. When temperatures drop below about 10°C (50°F), their digestive enzymes no longer function, and dormancy is initiated to protect their survival through cold winter months. The American oyster is one of the hardiest animals in the marine environment.

The majority of oysters from the northeastern US are sold live and fresh. Strong consumer demand for live oysters tends to make much of the harvest from this region too expensive to process.

OYSTERS FROM THE NORTHEASTERN US OFFER SUPERIOR VALUE



- Northeastern US oysters have a long shelf life and can tolerate prolonged refrigerated storage, especially in winter. While oysters are best eaten fresh, properly refrigerated, an American oyster should last 2 to 3 weeks if held cup down unless the shell is chipped.
- Harvesters and dealers maintain stringent safety protocols in growing and handling oysters.
- The practice of growing American oysters results in one of the lowest carbon footprints of any food production method.
- Northeastern USA water quality is routinely monitored. Oysters can only be marketed if grown and harvested from clean waters, making cleansing through depuration unnecessary.
- Northeastern US oyster growers are able to offer a wide variety of flavor profiles and sizes of oysters. There is an oyster to please every palate.
- Northeastern US oysters are grown without use of manmade feed, chemical fertilizers or antibiotics.

FLAVOR ATTRIBUTES



Like wines, American oysters have varied and distinct flavor profiles derived from the estuary or tidal areas where they were raised. The particular combination of water salinity, season, diet, and substrate mineral composition in a growing area influences flavor. Most notable is the degree of saltiness in the taste. There can also be remarkable flavor differences seasonally.

Every grower produces a distinctively flavored oyster. An experienced palate can detect the subtle flavor difference in oysters harvested from two adjacent farms. The wide variety of possible flavors makes the northeastern US a popular destination for oyster lovers.

COMPONENTS OF OYSTER FLAVOR



Salinity - The oyster adopts the salinity of the waters in which it's grown. The American oyster can tolerate water salinities ranging between 8 - 45ppt (parts per thousand). Salinities on oyster farms in the Northeast range from 10-32 ppt., which influences the degree of saltiness in oyster flavor.

Season - In late summer (August and September), oysters begin to fatten up in preparation for going dormant through the long winter period. These "Fall Oysters" are full and plump with a unique, sweet flavor profile. By winter's end, the oyster will have become a little thin. It rapidly fattens up again during the spring as it prepares to spawn. The spawning flavor is creamy, delicious, and distinctive from the fall oysters.

Diet - The particular species of natural phytoplankton available for the oyster to consume can vary with the season. In spring, there might be a bloom of red plankton that produces a red tinge on the gill and special flavor. In fall, certain growing areas will have a bloom of green algae, which results in the oyster having a deep green gill that imparts a sort of buttery flavor that is not unlike the well-known French Fine de Claire oyster.

Minerals - The American oyster's flavor is also influenced by the minerals that the oyster is exposed to within the environment. In Maine, for example, where soils are granite, oysters tend to leave a clean finish on the palate. In contrast, growing areas south of Cape Cod, Massachusetts, and into Rhode Island's coastal ponds, and on to the Long Island, New York coastline have a very rich finish taste from the different mineral composites found there.

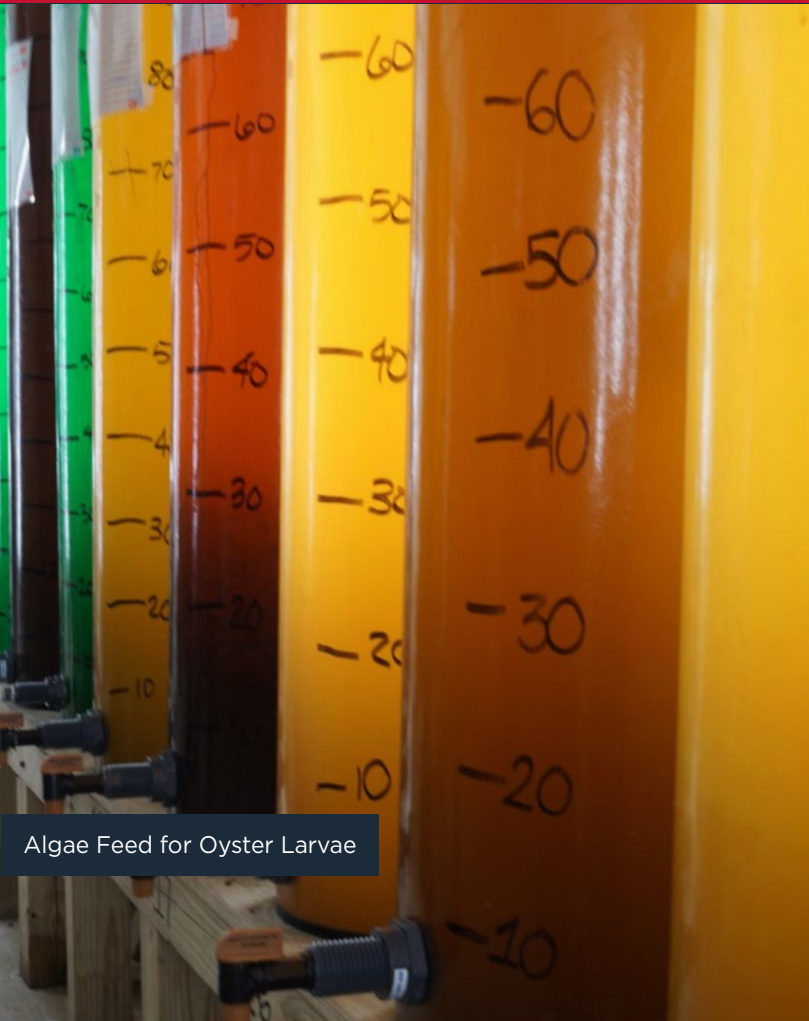
CULTURED BY HAND



Individual oyster growers of the northeastern US (Maine through Delaware) are strong and adaptable. Hundreds of farms dot the coastline. Most are small farmers with ten or fewer employees who take great pride in producing oysters of varied and unique tastes. Each farmer also has a distinctively engaging story.

It is a compelling livelihood that produces a delicious product while preserving clean water and the sustainability of our oceans. Oyster production in this region has doubled over the last five years, and it's on track to double again over the next five years due to strong consumer demand and efficient production methods.

FROM HATCHERY TO HARVEST



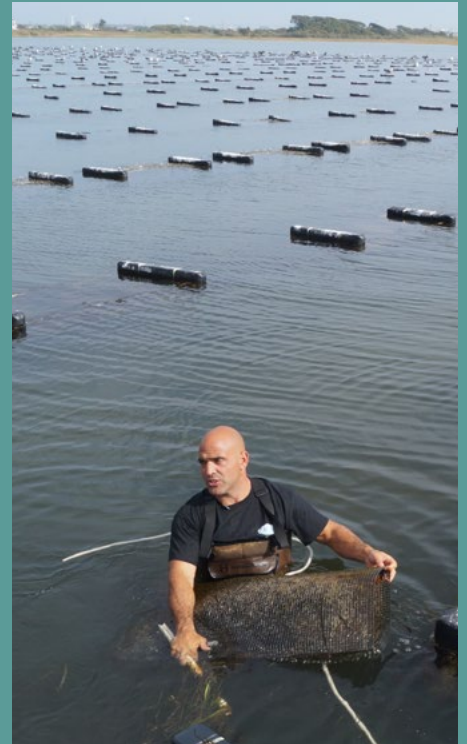
Algae Feed for Oyster Larvae



Juvenile Oysters

Oyster farming starts with hatchery-reared lines selected for disease resistance. Oyster larvae produced in hatcheries are fed a diet of algae for 2-3 weeks. Larvae then attach to a provided substrate, usually microscopic fractions of oyster shell. Once wild or hatchery-reared larvae attach to a surface, they are called spat. The settled spat are held in the hatchery until reaching a 1-2 mm size before being moved to a field nursery system. As the spat grows to 20-25 mm, they are transported to farms in coastal waters.

Oyster growers select their preferred grow-out method based on many factors including their farm's geography, potential predators, local government regulations, and climate. American oysters are grown using a variety of techniques: they can be placed directly on the sea floor, suspended in nets or trays, held in bags on rigid structures on the bottom in the intertidal zone or deeper waters, or floated at the water surface in cages or bags.



GROWING METHODS:

There is a wide variety of innovative grow-out methods, which include bottom and off-bottom methods. Off-bottom methods can consist of floating or suspended trays, racks, bags, and cages. Growers may employ various methods resulting in oysters in many different shapes.





CULTURE METHODS

Influence Shell Shape and Meat Density

- **Lots of handling produces a rounder shape and a more uniform, thicker shell.**
- **Bottom-grown oysters have a thick, dense shell that can be irregular in shape with plump meat.**
- **Good attention to proper stocking density and good farming practices are necessary to produce a meat-filled oyster.**

Culturing methods develop and influence the shell shape, meat-fill density within the shell, and product shelf life. If a grower doesn't handle the product much or practice careful farming, the shell can be thin. That shell might be prone to chipping in shipping and, when the shell gets chipped or fractured, the oyster may die.

Lots of handling is the norm. Tumbling oysters by hand or machine mimics the natural conditions wild oysters would experience from wave action on the open ocean bottom. Tumbled oysters grow stronger, which results in a thick and dense meat-filled shell. Some growers remove their oysters from caged gear and release them on the open bottom to tumble for three to six months.

OYSTER SIZES

Oyster farms from the Northeastern US produce a wide range of sizes to suit every customer preference. There is no standardized or official sizing nomenclature. The smallest oysters may be called “Petites” or could be marketed as “Cocktail” size.

Petite 2.5-3 inches (55-75mm)

Standard 3-4 inches (75-100mm)

Large 4-6 inches (10cm-15cm)

Jumbo 6-8 inches (15cm-20cm)



NORTHEASTERN US OYSTER SIZES AND SHELF LIFE

SUPERIOR SHELF LIFE

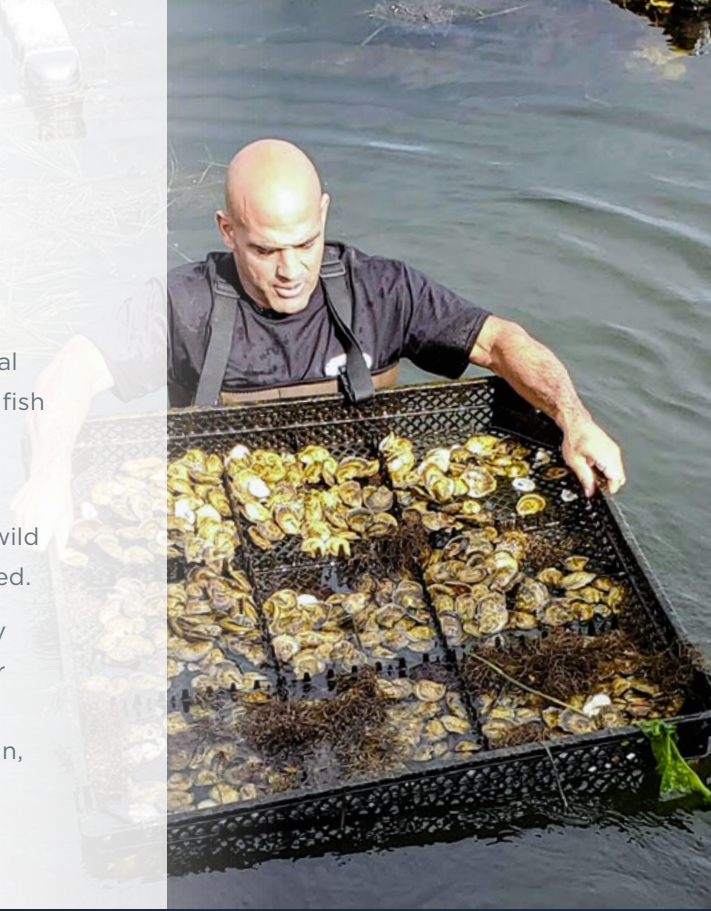
The American oyster has a long shelf life and can tolerate prolonged refrigerated storage, especially in winter. While oysters are best eaten fresh, properly refrigerated, an American oyster should last 2 to 3 weeks if held cup down unless the shell is chipped. These storage conditions preserve the original distinctive and unique flavors that could be lost if the products were held in seawater. The American oyster has a superior shelf life, for example, compared to the Pacific oyster (*Crassostrea gigas*) or the Belon/European flat oyster (*Ostrea edulis*). Unlike the American oyster, these species of oysters tend to gape which can cause them to dry out, often necessitating storage in sea water. Storing the American oyster in seawater is not recommended because it will quickly alter the flavor profile unique to its native waters.



IT ALL STARTS WITH CLEAN WATER

Each coastal US state has a documented protocol to ensure that no illegal shellfish enters the marketplace. In the US, waterways are classified for cleanliness and routinely tested for the presence of fecal coliform. It is a different system than used in Europe. In Europe, shellfish meats are sampled and tested for fecal coliform. Both systems work equally well. US water classifications include:

- **Class A or Open Waters** - These are open areas for growing or wild harvests. Shellfish taken from these waters can be freely marketed.
- **Conditional Waters** - These are Class A waters that are routinely closed after a certain amount of rainfall. Land runoff of rainwater makes these waters temporarily less clean. Once the rainfall has stopped and the waters are sampled again and shown to be clean, they are reopened.

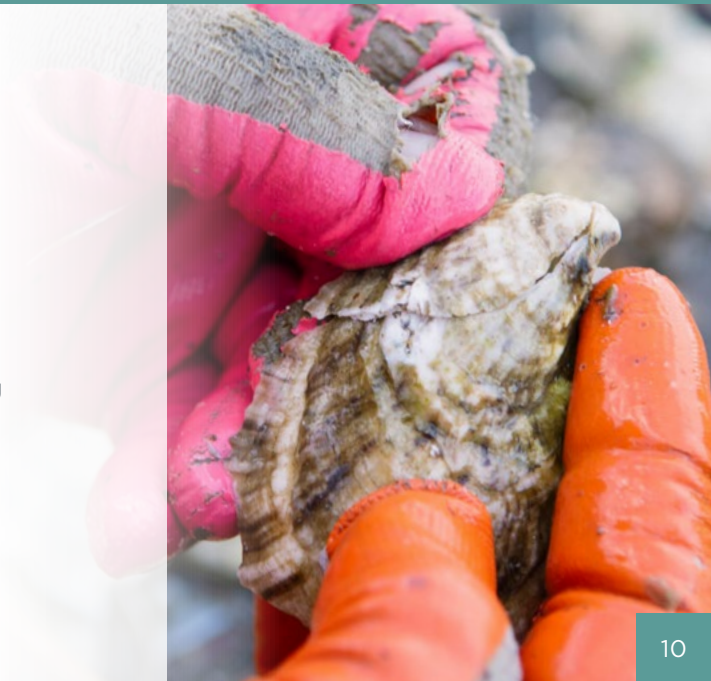


WELL-REGULATED FOOD SAFETY

US shellfish growers and dealers are regulated by a governing body, the Interstate Shellfish Sanitation Conference (or ISSC). State regulators create compliance rules that growers and dealers must adhere to for ensuring food safety. The U.S. Food & Drug Administration (FDA) oversees these regulations covering growing area water classification, product traceability tagging, product handling, and transportation.

NOROVIRUS is the most common foodborne illness, however, very few cases result from shellfish consumption in the US because it is illegal to discharge human waste into coastal waters. Vessels of every type are required to be equipped with wastewater holding tanks that are emptied at shoreside pumping stations. Also, high-performance wastewater treatment plants in the US result in fewer norovirus cases than other countries.

Waters are also monitored for harmful algal blooms. This monitoring program has been very successful. Over the last 50 years of this program, there have been no illnesses reported from consuming commercially harvested shellfish.



Each US state strictly regulates and enforces product handling. All shellfish growers must undergo mandatory training to comply with product handling rules and regulations. Time and temperature controls are strictly regulated. For example, in the summer, growers dip their oysters immediately into an ice bath to ensure that the meat temperature is below 10°C to completely stop any post-harvest growth of Vibrio bacteria.



PRODUCT HANDLING AND TRACEABILITY

Licensed US shellfish dealers are allowed to sell to other dealers or restaurants, or retail chains. All shellfish dealers must undergo a mandatory three-day Hazard Analysis and Critical Control Point (HACCP) training as well as regular government inspections of their facilities and records. Dealers must record product temperature when receiving the product to ensure that no thermal abuse has occurred and temperature tracking continues through holding and sales distribution.

All shellfish lots must be tagged with the harvest area, harvest date, grower, shipper, lot number and quantity.

	GROWER NAME:
	GROWER IDENTIFICATION NO.:
	HARVEST DATE:
	HARVEST LOCATION:
	TYPE OF SHELLFISH:
	QUANTITY OF SHELLFISH:
	SHIPPER NAME:
	SHIPPER LICENSE NO.:
THIS TAG IS REQUIRED TO BE KEPT ATTACHED UNTIL CONTAINER IS EMPTY AND THEREAFTER KEPT ON FILE FOR 90 DAYS.	

NUTRITIONAL VALUE

Oysters from the Northeastern US are a sustainable and healthy protein. A 100g (3.5 oz.) serving contains over 5 grams of protein and only 59 calories. Northeastern oysters are excellent sources of zinc (immune-system boosting), B12 (for healthy nerve and blood cells), selenium (for thyroid functioning and metabolism) and 0.68 grams of Omega-3 fatty acids per serving.



Serving Size: 100g (3.5oz.) about two, medium-sized shucked oysters

Total Fat	1.6g
Total Carbohydrate	5.5g
Protein	5.2g
Calories	59
Zinc	39.3mg
Iron	5.8mg
B12	16.2mcg
Potassium	124mg
Sodium	178mg
Cholesterol	25mg
Selenium	63.7mcg



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.



TO LEARN MORE ABOUT OYSTER PRODUCTS

Food Export USA® — Northeast
One Penn Center • 1617 JFK Boulevard, Suite 420 • Philadelphia, PA 19103 USA
telephone 215.829.9111 • info@foodexport.org
www.foodexport.org

Food Export-Midwest and Food Export-Northeast administer many services through Market Access Program (MAP) funding from the Foreign Agricultural Service (FAS) of the USDA. Food Export-Midwest and Food Export-Northeast prohibits discrimination in all its programs and activities on the basis of race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, familial/parental status, income derived from a public assistance program, political beliefs, reprisal or retaliation for prior civil rights activity. Persons with disabilities who require reasonable accommodations or alternate means of communication for program information should contact us. Additionally, program information may be made available in languages other than English. Food Export Midwest and Northeast do not tolerate fraud and are vigilant in preventing fraud in any of our programs. Food Export reserves the sole right to accept or deny companies into our programs. For complete participation policies and our code of ethics, visit: www.foodexport.org/termsandconditions. To file a program discrimination complaint, go to <https://www.ascr.usda.gov/filing-program-discrimination-complaint-usda-customer>. Food Export-Midwest and Food Export-Northeast are equal opportunity employers and providers.