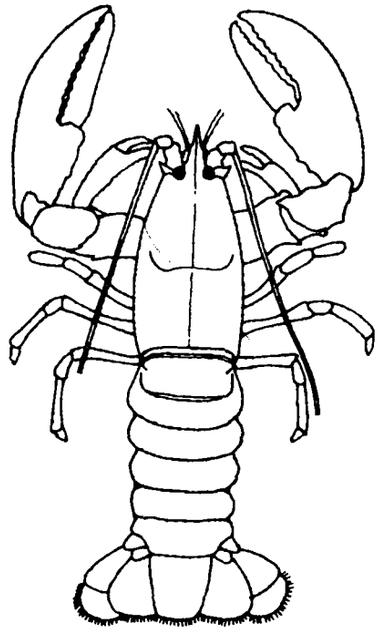
Being a bouillabaisse of fascinating facts about

FISH: The most-asked questions Part 2

More of the most repeatedly asked questions and answers about life in the sea have been collected from marine scientists in the National Marine Fisheries Service. This is the second in a series of articles designed to satisfy the curiosity about marine invertebrates that people often express in queries to NMFS: **Shellfish and Other Invertebrates.**

How many kinds of lobsters are there in this country, and why are different varieties called lobster?
Two kinds of lobster-like crustaceans exist in United States waters. The "true" lobster (the American lobster) is designated as such to differentiate it from the other form found here, the spiny lobster. The two, from different families, display two differences: The true lobster has claws on the first four legs, lacking in the spiny lobster; the spiny lobster has a pair of horns above the eyes, lacking in the true lobster. To avoid confusion over common names, it is best to call the true lobster the "American lobster," and the spiny lobster just that. The item marketed as "lobster tail" usually is a spiny lobster. The spiny lobster is found in warm waters off Florida, in the West Indies, and off southern California. Record weight for the American lobster is 45 pounds.



Does the deepwater northern lobster population differ from that found just off the coast?
The species in each population are identical in all respects.

How far do lobsters travel?
Inshore lobsters tend to stay in one place, seldom moving more than a mile or so, but deepwater lobsters farther out on the Continental Shelf follow a seasonal migratory pattern shoreward in summer, returning to the Shelf again in the autumn. The record travel so far is 225 miles covered by a lobster tagged off the Continental Shelf and recovered at Port Jefferson, Long Island, New York.

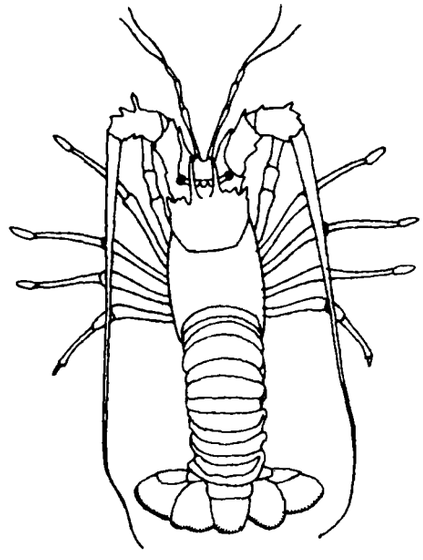
What does a lobster eat?
Mussels, crabs, clams, and seaworms, as well as dead fish.

What color is a lobster's blood?
Colorless. When exposed to oxygen, it develops a bluish color.

What is "tomalley"?
Tomalley is the lobster's liver. It turns green when cooked and is considered a delicacy.

What is the coral colored material often seen in a cooked lobster?
Coral is the egg mass of a female lobster. Cooking colors the tiny eggs a deep coral or red.

How does a lobster grow?
It sheds its hard shell and grows a new, larger one. Since the skeleton is on the outside, this molting is essential to growth.



How many times must a lobster molt before it reaches market size?
Between 20 and 30 molts take place before a lobster reaches the one-pound market size.

How old is a one-pound lobster?
No one knows exactly, but aquarium studies suggest 5 to 7 years.

How many one-pound lobsters are needed for a pound of lobster meat?
Five, on the average.

How long can a lobster live out of water?
Several days if kept in a cool, moist environment. The lobster is a gill-breather, and moisture is essential to survival.

Can a lobster be kept alive in fresh water with ice?
No. Fresh water is lethal to a lobster. The animal has salty blood and tissue, which require a seawater environment if life is to be maintained.

Why does a lobster turn red when cooked?
The red pigment is the most stable component of the coloring in a lobster shell. The greens and browns which darken the shell in a live lobster are destroyed by cooking.

How can one tell if a boiled lobster was alive when cooked?
Upon the death of a lobster the tail loses its elasticity and ability to curl under the body. When plunged into boiling water, a live lobster curls its tail under. It remains in that position during and after cooking.

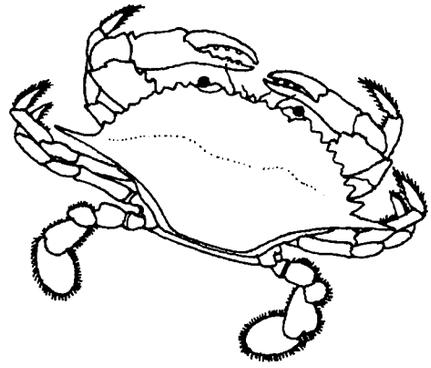
Have people been poisoned by eating lobsters that were allowed to die before being cooked? Is it true that a dead lobster deteriorates very rapidly? What happens when a live lobster is frozen?
Lobsters are not poisonous if they die before cooking, but cooking should not be delayed. Many lobsters sold commercially are killed and frozen before cooking. Lobsters and other crustaceans do spoil rapidly after death, which is why many buyers insist on receiving them alive. If the lobster is "headed" before or soon after death, the body meat will keep fresh longer. This is because the so-called head includes the thorax, the site of most of the viscera and gills, which spoil much more rapidly than claw or tail meat. Freezing slows deteriorative changes and harmful chemical actions that follow death.

Is it possible to raise lobsters on a commercial basis?
No, but research is underway to develop rearing techniques and to assess the economic feasibility of rearing lobsters commercially. Success is doubtful. It is difficult to rear the lobsters from egg stage through a long larval life—usually several months long. Juvenile lobsters can be collected from the natural environment, but the expense of collecting, holding, and feeding them to market sizes is prohibitively high. An additional problem is that lobsters are cannibalistic when crowded together.

Have Maine lobsters been successfully transplanted to the west coast?
Attempts have been made to transplant American lobsters to Pacific waters, but none have been successful, probably because of different ecological conditions.

I've heard that lobsters molt, but I've never seen a cast-off shell. Why?
Lobsters often eat the cast-off shell to regain needed minerals.

Can crabs swim?
Most crabs "walk" or run across the ocean bottom. Some, such as the commercially caught blue crab of the Atlantic coast (a member of the one family of "swimming crabs") can swim. Their rearmost pair of legs is modified for swimming and legs are paddle-shaped.



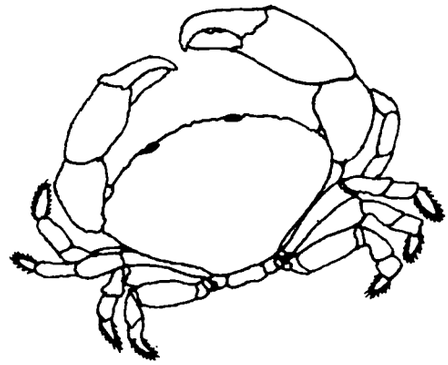
How do crabs grow?
By shedding their outgrown shell. The rigid shell imprisons the crab and limits growth. Once the shell is shed, the crab can absorb water and expand into its newgrown shell.

How much does a blue crab increase in size on molting?
Under normal conditions, about a one-third increase occurs with each molt.

What is the difference between soft- and hard-shell crabs?
They are the same species. A soft-shell crab is one that has just discarded its shell. Crabs which have just shed their shell hide in rocks or bury themselves in sand and mud to escape predators. They emerge after the new shell hardens, a quick process.

How old does a blue crab get?
A female may live 2 years, a male 3.

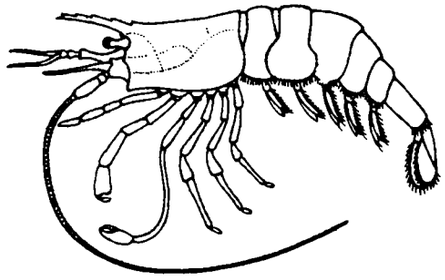
What is a "coconut crab"? Where do they live?
A large, land hermit crab, which lives on tropical Pacific islands. The crab is so named because it eats coconuts, is even caught on coconut used as bait. The meat is considered a delicacy in the islands.



Is a stone crab harmed when its large claw is broken off?
Fisherman often break off the large claw and throw the crab back into the water. If the break is made at the first joint, the crab is not harmed. The stone crab can and does sever its own claw at the first joint (by muscular contraction) to escape from danger.

What are the small crabs found inside oysters? Are they harmful to oysters? May humans eat them?
These are "pea" crabs. They live, often in pairs, inside the oyster shell, eating food collected on mucous strands in the oyster. Because they do cause damage to oyster mantle and gills, the crabs are considered parasites. Pea crabs are not harmful to man.

How do prawns, crayfish, and shrimp differ?
As so often happens, common names are used loosely and inconsistently in the shrimp family. The "prawn" of Great Britain and other countries is essentially the same animal as the shrimp of the United States. In this country, the term "shrimp" applies to all crustaceans of the *Natantia* group, regardless of size. "Crayfish" or "crawfish" are names given to both a common freshwater crustacean and to the saltwater spiny lobster.



Is there more than one kind of shrimp?
Numerous varieties exist, among them brown, white, pink, royal red, brine, and rock shrimp.

How big do shrimp grow?
Depending on the species, size ranges from about ½ inch long on the west coast of the United States, to almost 12 inches elsewhere.

How long do shrimp live?
The life cycle varies geographically and by species. Some live as long as 6½ years, others live only a year.

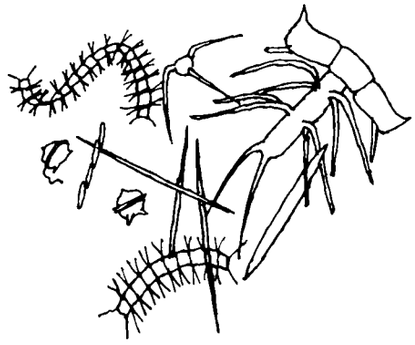
How many eggs does a shrimp produce in one spawning?
About 500,000.

How much shrimp is produced in the United States, and where is the largest catch taken?
The annual catch has been running close to 400 million pounds for several years. The Gulf States usually lead in shrimp catches, with Texas and Louisiana the leading States. Alaska has been an important shrimp producer for the past several years. The shrimp fishery has the highest market value of all U.S. fisheries.

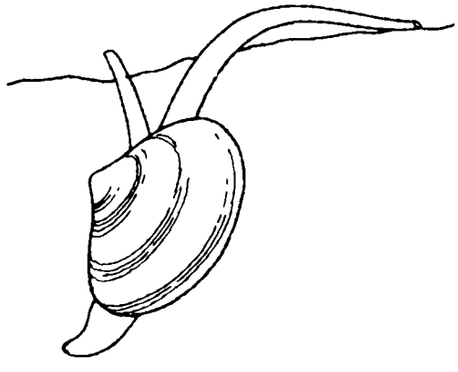
What are the commercially important shrimp on the east coast of the United States, and what are their ranges?
Three shrimp species are of primary commercial importance: Pink shrimp from Cheseapeake Bay through the Gulf of Mexico and the West Indies to Brazil; white shrimp from Fire Island, New York, to Cape Kennedy, Florida, in the Gulf of Mexico from Pensacola, Florida, to Campeche, Mexico, in Cuba and Jamaica; brown shrimp from Massachusetts down the east coast through the Gulf of Mexico, and the West Indies to Uruguay.

What is the biggest bivalve mollusk, cephalopod mollusk, and crustacean known to man?
The biggest bivalve mollusk is the clam *Tridacna,* native to the Indo-Pacific, which reaches a weight of 500 pounds. The giant squid, nearly sixty feet long, is the biggest cephalopod. The Alaskan king crab is the largest of the crustaceans, weighing up to 15 pounds, and measuring four to five feet across shell and claws.

What do oysters and clams eat?
Called filter feeders, oysters and clams eat plankton. By pumping water through their bodies, the mollusks strain the microscopic organisms through their gills, which act as sieves.



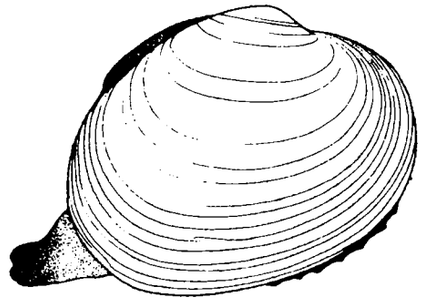
Clams seem to squirt water through their siphons. What purpose does the siphon serve?
Three main purposes: breathing, obtaining food, and eliminating waste products. Since clams are relatively immobile and movement is usually limited to burrowing in the sand, their double-tubed siphon—which operates much like a snorkel—is their lifeline. Inflowing water is pumped through the siphon, passed over the gills, and strained to remove food particles. After receiving carbon dioxide from the gills and other waste products from the digestive tract, the water is expelled through the outgoing siphon. Constant circulation of the water is maintained by the beating of a multitude of microscopic hairs (called cilia) located inside the tube and in the gill chamber.



What causes a reddish color in the liquor of shucked oysters and clams?
The red algae they sometimes consume, often composed of the microscopic one-celled dinoflagellates which appear in planktonic mass.

How does a clam shell grow?
A thin tissue that adheres to the inner surfaces of the shell, called the mantle, and a thickened rim of muscular tissue at the mantle edge deposit new shell material at the shell edge. Rings on the shell indicate how many years old a clam may be.

How do clams establish themselves on the sea bottom?
Certain kinds of clams, in early stages of life possess a gland that produces a thread-like material (byssus) that serves to anchor them to grains of sand or rocks. Other types of clams lack a byssal gland and use the foot to burrow into the seabed. As the clam grows, its wedge-shaped foot, which expands and contracts as it moves, becomes more important as a burrowing tool.



How do clams reproduce?
Eggs and sperm are released into the water seasonally, generally in mid-summer when water is warm and planktonic food is abundant. After fertilization of an egg, cellular division produces larvae and eventually tiny clams that settle to the bottom. In a few species, the larval stage is completed within the mantle cavity of the parent.

Which of the clam species is of greatest commerical importance to the United States, where is it fished, and what quantities are landed?
The oceanic surf clam is the most important commercial species. The largest clam of the U.S. east coast, it sometimes reaches a shell length of more than eight inches. Landings of surf clams in New Jersey and Virginia account for about half the total U.S. annual landings of all clam species. The surf-clam catch in recent years—in shucked meats—ranged from about 41 to 63 million pounds.

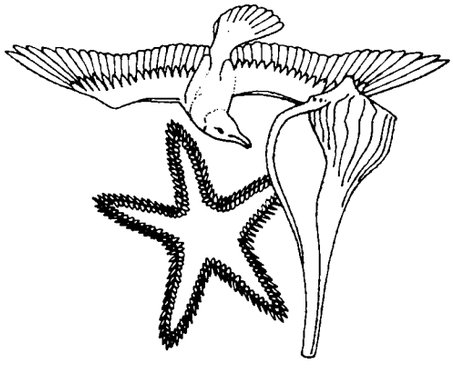
How are soft-shell clams harvested?
They are dug from the intertidal flats of bays and estuaries at low tide in New England, using a short-handled fork to obtain clams living in burrows six to ten inches below the surface. In Chesapeake Bay, because the beds are mostly subtidal, a hydraulic dredge washes clams from the bottom and onto an endless belt that conveys the clams to the dredge boat.

How are hard-shell clams harvested?
Long-handled tongs, rakes, and small dredges operated from small skiffs in shallow subtidal zones of bays and estauries. The larger hydraulic escalator dredge is used for hard-shell clams as well as soft-shells.

How are surf clams caught?
A large (about 1½-ton) hydraulic dredge washes clams off the bottom and carries them aboard 60- to 100-foot vessels.

What is the biggest clam caught and eaten in the United States?
The geoduck (pronounced gooey-duck) clam caught in Northwest Pacific waters, weighs an average three pounds and yields over a pound of flavorful meat. Now sold commercially, geoduck clam meat can be used in minced form or in steaks.

What kinds of predators attack clams and oysters?
Man, water birds, rays, starfish, whelks, drills, and sponges, among others.



What are oyster borers?
An oyster borer, or drill, is an aquatic snail that preys on oysters, especially thin-shelled young oysters. Using a band of scraping teeth (a radula) and a shell-dissolving secretion, the gastropod drills a hole in the oyster shell and eats the creature within.

How do oysters produce pearls?
Pearls begin with the presence of a foreign substance, such as a grain of sand, that lodges in the shell. The oyster's body reacts by depositing layers of nacreous (pearllike) material around the foreign body to wall it off and reduce irritation.

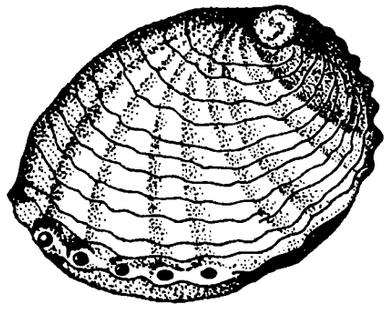
Do all oysters produce pearls?
Many oysters—as well as some clams and mussels—manufacture material like the pearl-producing substance. True pearl-producing oysters, however, inhabit waters of the Indo-Pacific.

Is it safe to eat oysters during the months without R's?
Yes. Fresh oysters properly refrigerated are wholesome and nutritious throughout the year. They spoil rapidly at high temperatures, however. The belief that oysters were unsafe to eat in May through August arose in earlier days when refrigeration was less prevalent than it is today.

How does a scallop move?
It compresses the valves of its shell and forces water backward in jets near the shell-hinge. The force drives the scallop in the direction of the shell opening. The bivalve appears to be clapping the two sides of its shell together.

Are any snails commercially caught for food off the coasts of the United States?
The most commonly eaten snails in this country are the abalone, caught in the waters off California, and various conchs from Atlantic waters.

What purpose do the holes along the edge of an abalone shell serve?
Internal gills discharge water through the holes, as part of an abalone's respiratory process.



Are there any poisonous marine snails?
Yes. Cone shells (family *Conidae*) include members with toxic venom. These mostly tropical forms can be highly toxic, even fatal, to man. Their poison is injected by a spear-shaped rod called a radula.

What is the sand collar that one often sees on beaches at low tide?
A sand collar is the egg case made by moon snails, of the family Naticidae. The eggs are laid in a gelatin-like matrix with which sand grains are mixed. The individual egg capsules can be seen under a magnifying glass or microscope. When the little snails hatch, they swim around for a while before settling on the bottom.

What is chitin?
The structural material that forms the shells of crustacea, such as crab, shrimp, and lobster.

How does the consumer know that shellfish are safe to eat?
Clams and oysters in the shell should be alive and the shells should be closed tightly or should close when the mollusks are tapped. The U.S. Public Health Service, in cooperation with the States, has a sanitation control program that covers the labeling and shipment of clams, mussels, and oysters. These shellfish may be harvested only from non-polluted waters and processed for shipment in sanitary plants inspected by State shellfish inspectors. Authorities periodically test water for sewage pollution and ban catches from polluted areas.

How unsafe are shellfish from polluted waters?
They are dangerous to man, causing mild to severe illness, sometimes death. Both sewage and industrial wastes can affect shellfish.

Will cooking make sewage-polluted shellfish safe to eat?
Not entirely. Cooking will kill bacteria that cause some diseases, but it is not known whether certain virus diseases, such as infectious hepatitis, can be prevented by cooking.

Is it possible to purify shellfish from sewage-polluted water for safe eating?
Yes. Sewage-polluted shellfish transplanted to clean water purify themselves rapidly and become safe to eat.

Do shellfish contain mercury levels dangerous to man's health?
No. Tests of shellfish to date have shown mercury levels to be below those considered dangerous to humans.