SPECIALTY PRODUCTS

Specialty products may be defined as articles in which fish is only a portion of the ingredients, or which require a greater amount of preparation for canning than is usual. Soups, chowders, stews, and various kinds of fish cakes are the principal commercial types, but any ready-to-serve dish containing fishery ingredients should be included. A variety of such products is canned from time to time, but only those specialties prepared regularly are included in this publication.

CLAM CHOWDER

Two types of clam chowder are canned, "Manhattan" "Rhode Island", or "Coney Island" chowder; and the "New England" variety. The method of packing New England clam chowder is generally the same in all plants, but the formula for Manhattan chowder differs with each packer.

Both soft clams and quahogs are used, the species usually depending on whichever is most abundant. Quahogs are preferred by some packers as the clam flavor is stronger. Potatoes used for chowder should be firm-textured, with few and shallow eyes, regular shape and smooth surface. Salt pork should be fresh and free from rancidity, usually a good grade of fat brisket pork. Smoked bacon is specified in some published formulae, but is not favored in practice. In packing Manhattan style chowder, standard grade tomatoes in "gallon" (No. 10) cans are generally used. Carrots, celery, peppers or any other vegetables are fresh and of the best market quality.

MANHATTAN STYLE CHOWDER

A commercial formula for Manhattan style chowder contains the following ingredients:

65 lb. fine cracker crumbs
18 lb. ground salt pork
18 lb. ground onions
55 gal. water
24 No. 10 cans tomatoes
16 lb. salt
5 oz. white pepper

In making this chowder, 18 pounds of diced onions are simmered in the bottom of an 80-gallon steam-jacketed kettle. When they are soft, 18 pounds of ground salt pork are added. The pork and onions are then sauted until they are soft, but not brown, when 15 gallons of water are poured in and allowed to come to a boil. During this time 35 pounds of fine cracker crumbs are placed in a mixer with 15 gallons of water and beaten until smooth and the mixture is added to the boiling contents of the kettle.

NOTE.—[FL–86. Canning specialty products. Reprinted from Research Report 7, Fish and Wildlife Service, U. S. Department of the Interior. The complete report (366 pp.) is a reference book on commercial canning of seafoods and is obtainable from the Superintendent of Documents, Washington 25, D. C. Price 50 cents a copy].

A second batch of 30 pounds of fine cracker crumbs is placed in the mixer with 10 gallons of water and beaten until it is smooth. An additional 15 gallons of water is poured into the kettle when the contents have reached a temperature of 200° to 212° F., and when this boils the second batch of cracker-water mixture is added.

When the broth has been brought to the boiling point for the fourth time, the contents of 24 No. 10 cans of tomatoes are added, together with 16 pounds of salt and 5 ounces of white pepper. The soup is drawn off to the reservoir tank of a syrup filling machine such as is used in fruit canneries. Clam juice may be substituted for a portion of the water, but as a rule the liquid in Manhattan style chowder is water.

Meanwhile the potatoes have been mechanically peeled and de-eyed by hand. They are diced into ⅜ inch cubes and finally are blanched for 1 or 2 minutes or placed in sufficient water to cover to prevent discoloration. The clams are washed thoroughly to remove as much sand as possible. In some canneries they are then steamed sufficiently to open the shells, the siphon is removed and the whole clam is ground. Other canners use raw shucked clams removing the "stomach" or dark body mass and cutting off the siphons before grinding. This is believed to reduce the possibility of darkening.

Cans are usually lined with "C" enamel, seafood formula. Girls stationed on each side of a filling table place 2 ounces of potatoes in each No. 1 picnic can. Other girls then add 2 ounces of clam meat. If No. 3 cans are being packed the amount is 7½ ounces of potatoes and 7½ ounces of clams. The filling machine adds sufficient hot broth to fill the cans and they are sealed immediately. The process for No. 1 cans varies from 45 to 50 minutes and for No. 3 cans, 85 to 90 minutes at 240° F. (10 lb. pressure). The pack is water-cooled immediately after processing.

NEW ENGLAND CLAM CHOWDER

The method used for making New England style chowder follows the general outline just described, except that clam juice, previously heated to remove suspended solids, replaces at least a portion of the water, and no tomatoes are included, the only ingredients being potatoes, pork, onions, clams, juice, cereal "filler," and seasoning. Clams are added whole or only coarsely chopped. Flour is substituted for cracker crumbs. For the exact formula and method of preparing the soup, refer to the preparation of fish chowder. The processing times vary within the range previously given, but tend toward the upper limit. This pack is also water-cooled.

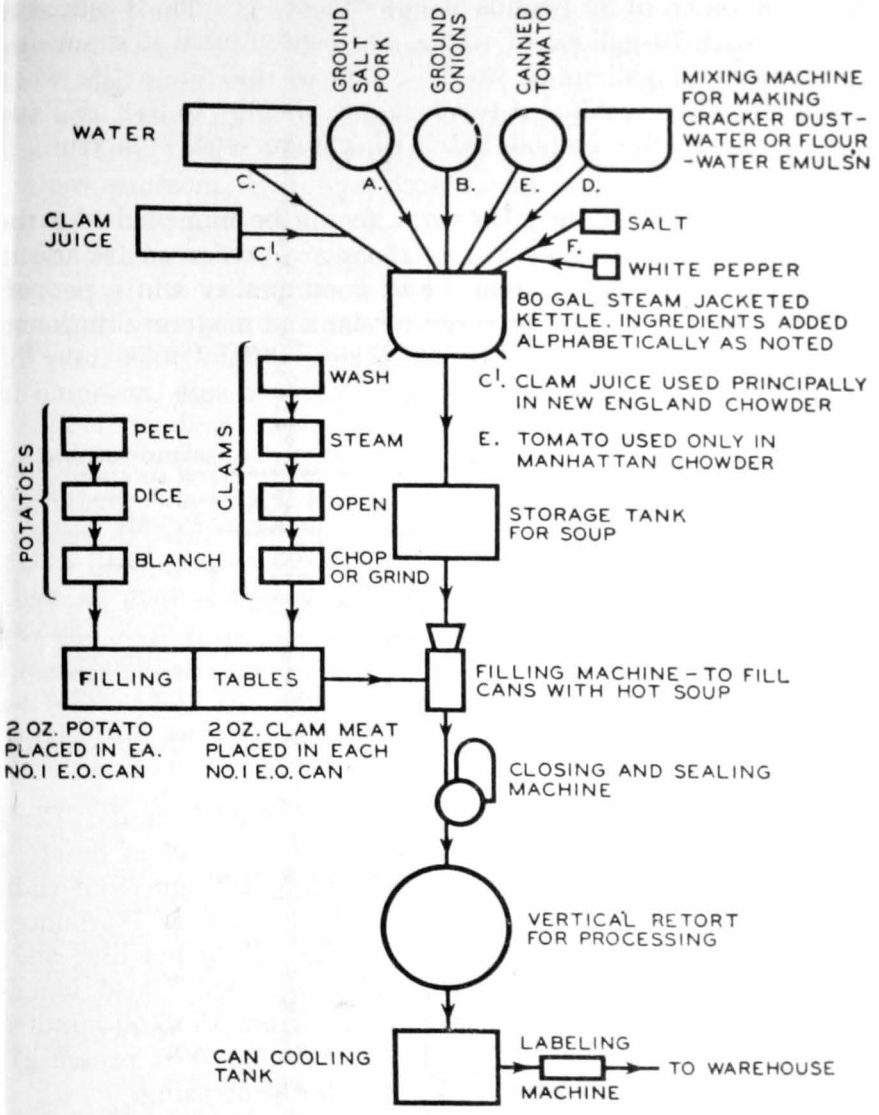

FIGURE 62.—Flow sheet of clam chowder canning.

In some canneries, chowder is made by the batch process, with all ingredients pre-cooked together in 80 gallon steam-jacketed kettles and paddles are used to stir the ingredients. This method is somewhat cheaper but it is claimed that the mixing is not efficient enough to give an even blend of ingredients in the can.

FISH CHOWDER

"Fish" chowder or "haddock" chowder is an "off-season" product, prepared when potatoes and fish are cheapest. Skill and experience are required, since carelessness or ignorance may result in discoloration and off flavors.

The fish are usually trawler-caught haddock. The broth portion is generally made from cod heads or fish filleting trimmings, of a quality equal to those portions sold in the fresh fish trade. For fish chowder, a firm textured potato of high starch and low moisture content is required, smooth in shape with eyes few and shallow. Potatoes with low starch and high mosture content "mush up" in processing. Potatoes should be blanched to avoid discoloration. Green Mountain potatoes are preferred for use in fish chowder. Salt pork should be of good quality and free from rancidity. Onions should be large in size and moderate in flavor.

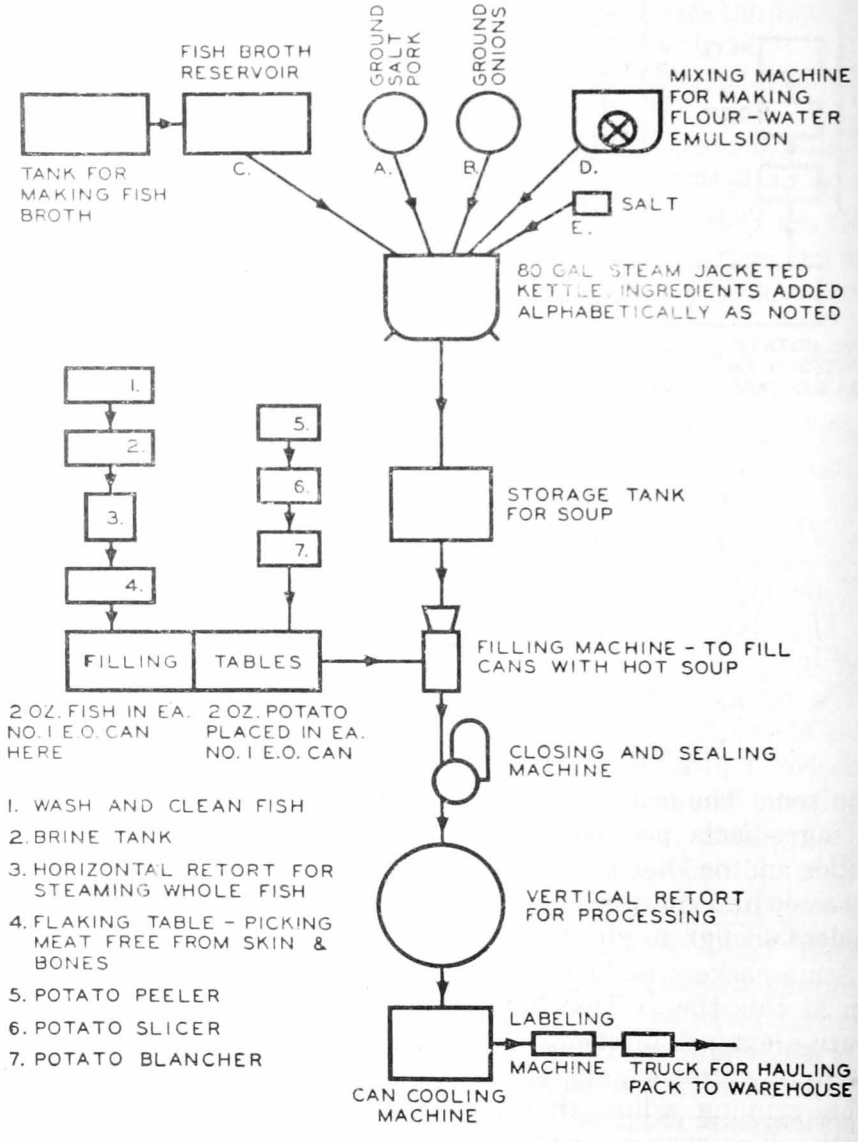

FIGURE 63.—Flow sheet of fish chowder canning.

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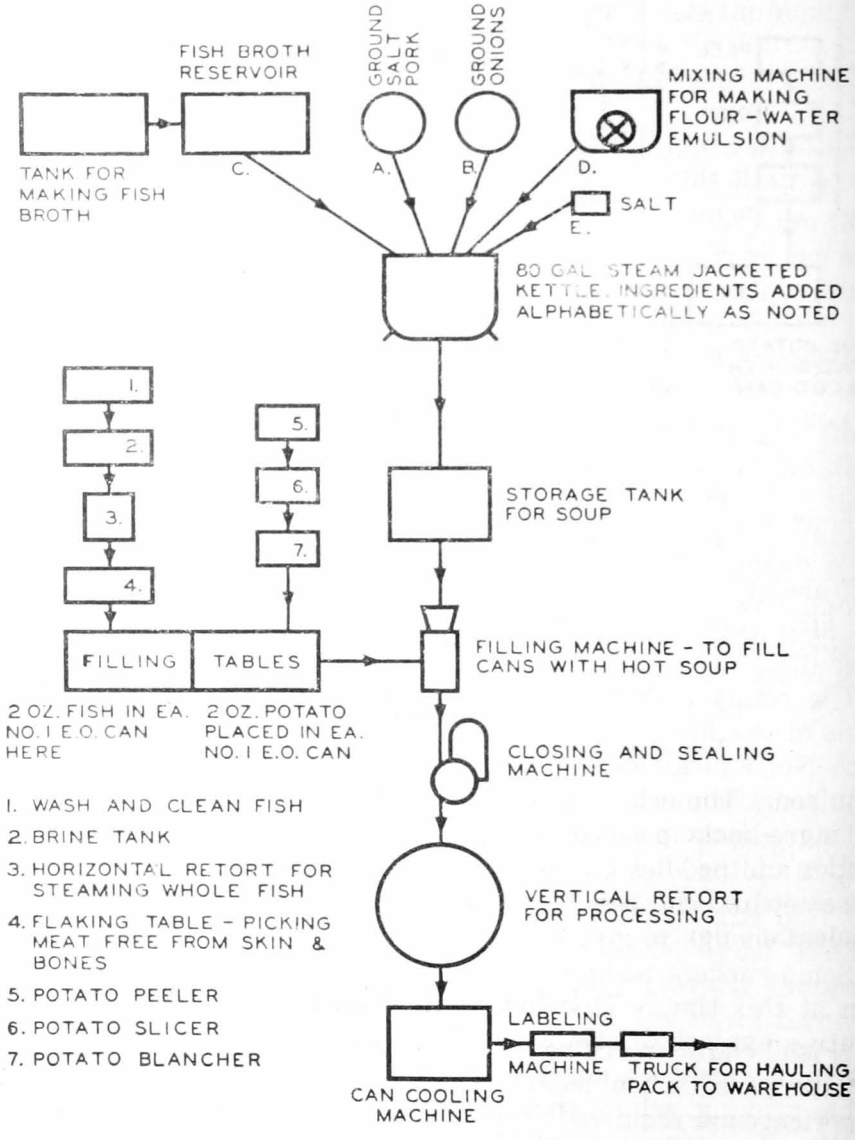

FIGURE 63.—Flow sheet of fish chowder canning.

The first step in packing fish chowder is to make the broth. About 1,750 lb. of fillet trimmings or cod heads enclosed in cloth or cotton mesh bags are placed in a tank with 500 gallons of water. Sometimes the fish are placed directly in the water, straining out the solid material after the mixture has simmered for 2 hours. The broth is then drawn off to a reservoir tank. As this step requires much time, two tanks are used by most canners for making broth, one batch cooking while the other is being drawn off for use.

Fish chowder "soup" ingredients:

50 lb. flour	56 gal. fish broth
18 lb. diced onion	25 gal. water
18 lb. diced salt pork	16 lb. salt
5 oz. white pepper	

While the broth is cooking, 18 pounds of diced onions are simmered until they are soft in an 80 gallon steam-jacketed kettle. Then 18 pounds of diced pork are added and while the pork is cooking, 25 pounds of flour is beaten in a mixing machine or "milk-beater" with 15 gallons of water until smooth and creamy. When the pork is soft, 20 gallons of broth are poured in the kettle and on reaching the boiling point, the flour emulsion is added. While the contents of the kettle are brought to a boil, a second batch of 25 pounds of flour and 10 gallons of water is prepared. Twenty gallons of broth are poured into the kettle when the mixture is again boiling, and when this in turn has boiled, the second batch of flour emulsion is added. Sufficient broth to bring the contents up to about 80 gallons, and 16 pounds of salt, are added when the mixture is boiling for the fourth time. When the broth boils for the fifth time it is drawn off to a tank connecting with the filling machine.

The empty cans move along a filling table on belt conveyors. Girls at the first section of the table add 2 ounces of haddock to each No. 1 picnic can from scoops which hold the exact quantity required. The fish may be steamed, as in pre-cooking fish flakes, but some packers use raw fish, cut in small chunks. At the second section of the table, 2 ounces of diced raw or blanched potatoes are added. Raw potato is reported to give the product a faintly unpleasant flavor.

Some packers add from 0.8 to 0.9 gram of citric acid to each can at this time. This harmless organic acid is used as a preventive against discoloration. The cans then pass to the filling machine which is a syrup filler of the type used in fruit or vegetable canning, where they are filled with a measured volume of broth. The cans are sealed without exhaust as the temperature of the contents should be about 165° F.

The process for fish chowder in No. 1 picnic cans varies from 60 to 75 minutes at 240° F. (10-lb. pressure). The pack is water-cooled immediately after processing.

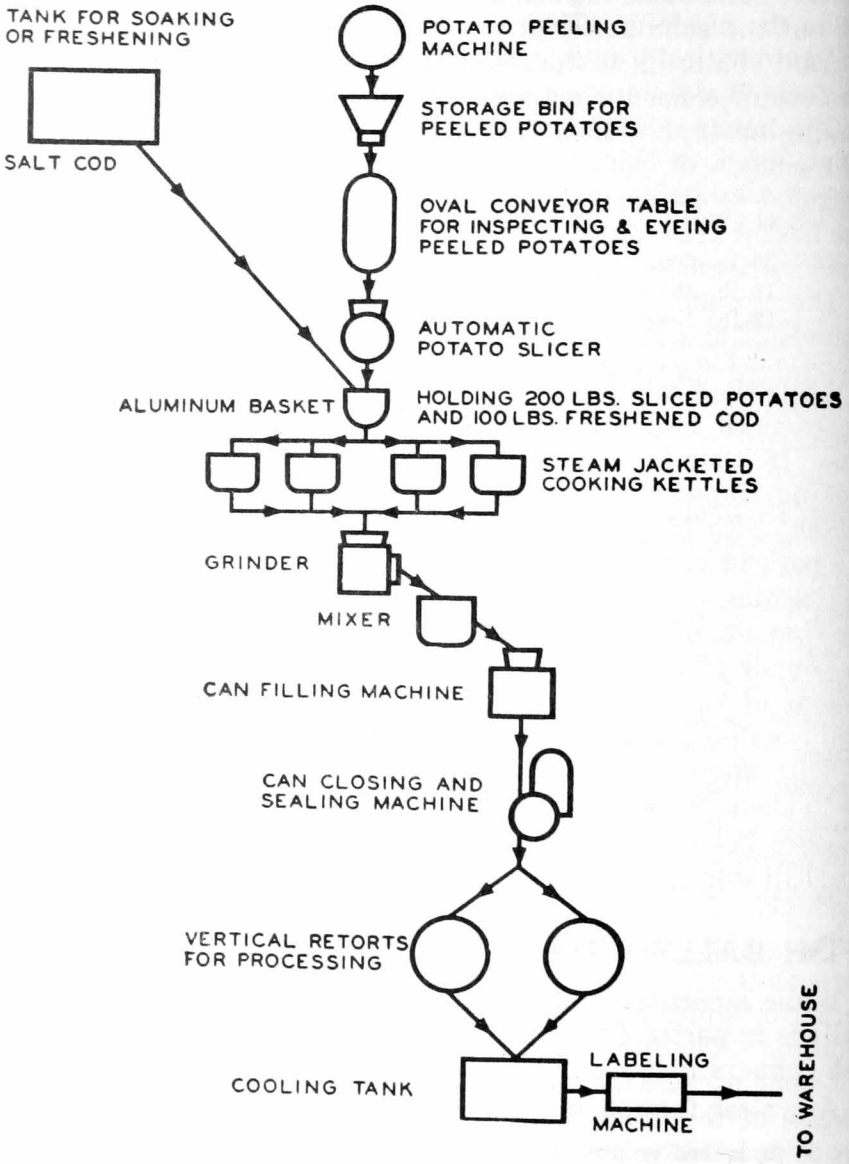

FIGURE 64.—Flow sheet for the canning of fish cakes.

FISH CAKES

The best quality salt cod and Green Mountain potatoes are generally used by canners of fish cakes. The ingredients are:

200 lb. potatoes	5 lb. hydrogenated coconut oil
100 lb. shredded salt cod	2 oz. white pepper

The cod is soaked in water to freshen about 10 hours, or 1½ hours if running water is used. The potatoes are peeled by machine, afterward passing along a conveyor where they are inspected by women who remove any "eyes" or bits of skin not taken off in the machine. They are then weighed in lots of 200 pounds and automatically sliced, falling into a large aluminum basket with perforated sides and a trap-door bottom.

One hundred pounds of shredded, freshened cod are added to 200 pounds of potatoes in the basket and carried to a steam-jacketed kettle partly filled with boiling water. The contents of the basket are boiled for 30 minutes, and conveyed to a plate type power driven grinder.

The ground mass is emptied into a mixer, together with 5 pounds of hydrogenated coconut oil and 2 ounces of white pepper, and mixed thoroughly for 5 minutes. The mixture is gradually dropped into the hopper of a filling machine which delivers a measured volume of material to each can.

Since this is a hot pack, no exhaust is used. The cans are sealed immediately at the rate of 60 per minute. Most of the pack is put up in 8-ounce flat cans, though a small amount is canned in No. 10 containers. The process for 8-ounce cans is usually 75 minutes at 240° F. (10-lb. pressure). No. 10 cans are processed 240 minutes at the same temperature and pressure. The pack is water-cooled immediately after processing.

Some packers add a small amount of citric acid dissolved in water when the fish cakes are in the mixer in order to inhibit discoloration. The product will taste decidedly sour if an excess of acid is used. A number of published formulae include onions and some fat such as beef tallow. Such ingredients are not generally used in the commercial canning of fish cakes.

FISH BALLS (FISKEBOLLER), NORWEGIAN STYLE

While a portion of the domestic supply of Norwegian-style fish-balls is imported from Norway, "Fiskeboller" are also packed by fish canners in the United States.

A typical formula used in the United States is:

56 lb. cooked ground haddock
5 gal. whole milk
5 gal. fish broth
2 lb. potato flour
1 lb. wheat flour
1 lb. salt
Nutmeg and ginger to taste

The haddock must be fresh, the milk sweet and fresh. Milk powder is often used in place of fresh milk as the quality is more easily controlled, and the product is more uniform. Nutmeg and ginger are generally used in the form of essential oils in an alcoholic solution.

The fresh whole haddock are washed, cleaned and placed in large shallow aluminum pans with perforated bottoms. The pans of fish are steamed for about 15 minutes at 240° F. (10-lb. pressure) or until the meat can be separated easily from the skin and bones. The flakes are ground through a three-eighths inch plate grinder.

The milk, fish broth, flour and seasonings are beaten to a creamy liquid in a mixing machine. The ground haddock is then added slowly and the mixture is beaten until it is a homogenous mass. The paste is filled into the hopper of an apparatus resembling a doughnut machine, which forms small cakes of the material, dropping them into a pan of hot water, where they remain about 10 minutes until "set."

The fish balls are then hand packed into "two-ration" (squat) and "four-ration" (1 lb.-flat) cans. The cans are filled with hot fish broth, made as described in the canning of fish chowder and are sealed at once without exhaust. The process for two-ration cans is 75 minutes, and for four-ration cans, 80 minutes at 230° F. (5-lb. pressure). The pack is water-cooled in tanks immediately after processing.

TURTLE AND TERRAPIN PRODUCTS

GREEN TURTLE SOUP

Green turtle soup is canned in New York and one or two other localities on the Atlantic seaboard, utilizing green turtles (*Chelonia mydes*) imported from Central America, especially from Yucatan, British Honduras, Nicaragua and the West Indies. Some of these turtles are taken by hand when they come up on land, but most are caught in tangle nets, a type of gill net. The nets and method of fishing have been described by Fiedler and Jarvis (1932).

These nets are from two to three fathoms deep and from five to 50 fathoms long. They are made with a 20-inch stretched mesh. A cork line of manila rope is run along the upper selvage and a lead line of the same material run along the lower selvage of the net. The corks are 2-inch blocks of wood made from the wood of the boya tree, a light wood resembling that of the mangrove tree. Some corks are also made from slab cork purchased in St. Thomas. The corks are spaced at intervals of 12 inches. Leads are fastened along the ground line at intervals of about 16 inches.

Turtle nets may be fished as drift nets or as sunken nets. The latter type is anchored by stone killicks lashed in a loop of the lead line at each end of the net. Buoy lines with marker buoys are fastened at each end of the cork line. Marker buoys are made from blocks of wood. A 50 fathom net is said to cost twenty dollars for material.

The nets are set in locations known to be frequented by turtles, with a wooden decoy roughly shaped like a turtle attached to each net. Turtles, attracted by the decoy, are entangled in the mesh of the net.

The turtles which weigh from 100 to 300 pounds are held in tanks or pens and shipped alive to Fulton Market, New York. Several published formulae are available but are useful only as guides and must be modified as experience indicates. The formula given below is of that type:

20 lb. turtle meat
20 lb. beef bones
10 gal. water
2 lb. diced onions
2 qt. sherry
1½ pt. olive oil
1 lb. flour
¼ to ½ lb. salt
8 fl. oz. Worcestershire sauce
3 oz. minced parsley
2 oz. cayenne
1 oz. marjoram
1 oz. thyme
½ oz. bay leaves
½ lb. diced celery

Instead of water 10 gallons of stock made by boiling the head, liver, lungs, heart, flippers, and shell in water, may be substituted. If this is done, beef bones are not needed. Otherwise, the beef bones are boiled in the 10 gallons of water, together with the celery, marjoram, thyme, bay leaves and parsley. While the stock is cooking, the meat, diced into small cubes, is cooked slightly over a low fire for 15 to 20 minutes in ¾ pint of olive oil.

At the same time the diced onions are cooked in the other ¾ pint of olive oil until brown, then strained out. Then 1 lb. of flour is added slowly to the oil and cooked, stirring meanwhile, until a smooth brown roux is obtained.

The stock is filtered until clear, then the roux is added gradually, mixing so that the soup will not be lumpy. The cooked meat is added, together with the salt and cayenne pepper. When the soup approaches boiling temperature again, the Worcestershire sauce and sherry are added, the soup is stirred vigorously, filled into containers and sealed immediately while hot.

Turtle soup is packed in containers varying from No. 1 picnic (211 x 400) to No. 2½ (401 x 411) cans. Representative processes are, for No. 1 cans 45 minutes and for the No. 2½ containers 65 minutes at 240° F. (10-lb. pressure). The pack is water cooled in tanks immediately after processing.

Some published formulae include lemon juice and chopped hard boiled egg yolks. It is understood that better results are obtained when these ingredients are added to taste by the consumer. Cooking sherry may be used, but imported sherry is favored for a fancy product. Some chefs prefer turtle soup without sherry, adding it to taste when serving the soup.

SNAPPING TURTLE SOUP

Two species of snapping turtle are canned to some extent, the common snapping turtle (*Chelydra serpentina*) and the hardshell, or alligator turtle (*Macrochelys lacertina*). The common snap-

ping turtle may reach a maximum weight of 40 pounds, but is usually much smaller. The common snapping turtle is taken commercially in the States around the Great Lakes, along the Mississippi River, and in New Jersey, Delaware, and Virginia. Snapping turtles are taken commercially by fyke nets, fish pots, haul seines, gaffs, hand lines, trot lines, and by hand, that is, simply picked up by the fishermen. Snapping turtles should be alive when marketed and Cobb (1919) stated that the females are best for canning.

"Snapper soup" is canned using the formula given for green turtle soup, or the following:

30 lb. snapper meat	2 oz. minced garlic
10 gal. water	2 oz. minced parsley
1 No. 10 can tomatoes	2 oz. white pepper
2 lb. minced onions	2 oz. whole cloves
2 lb. lard	½ oz. mace
1 lb. flour	½ oz. bay leaves

Salt to taste

The snapping turtles are beheaded and hung head downward until the blood ceases to drip. The turtles are cleaned, taking care not to break the gall bladder. The meat is separated from the bones and cut in small pieces. The meat is simmered, together with parsley, cloves, mace and bay leaves. The onions are fried in lard until brown, when they should be removed. The flour is added to the lard gradually, stirred slowly until an even blend is obtained and cooked until the roux is brown.

After about 15 minutes parboiling, the meat is removed to drain and the liquid is strained to obtain soup stock. The drained meat is fried lightly in ham fat or bacon drippings until the surface is a light brown. The roux is added to the stock gradually, followed by the tomatoes and meat. When the soup boils, the pepper and salt are added, the mixture is filled into No. 1 picnic (211 x 400) cans and sealed immediately while hot. The process is 40 to 45 minutes at 240° F. (10-lb. pressure) and the pack is usually water-cooled in tanks to about 100° F.

SNAPPING TURTLE STEW

"Snapper stew" is also canned in small quantities. No standard formula is used, but that given by Cobb (1919) is typical. A formula used in Louisiana for "Ragout de Tortue à la Bourgeoise" follows:

20 lb. snapper meat	⅛ oz. bay leaf
1 lb. minced onion	5 pt. water
½ lb. flour	½ pt. Madeira wine
½ lb. lard or	⅛ oz. minced garlic
1 c. olive oil	⅛ oz. thyme

Salt to taste

The meat is diced into cubes about 1-inch square. The onions are cooked with the lard or olive oil and garlic until yellow. Then flour is added slowly and the meat is put in. After the surface of the meat is braised slightly, water is added slowly. When the stew approaches the boiling point, Madeira wine and seasonings are added, the mixture is stirred well and filled into No. 1 picnic cans which are sealed immediately without heat exhaust or vacuum seal. The pack is processed for 45 to 50 minutes at 240° F. (10-lb. pressure), and is water cooled in tanks.

TERRAPIN STEW

The salt-water or "diamond-back" terrapin (*Malaclemmys palustris*) is the most highly prized of the edible turtles in the United States. At one time demand, together with depletion of the supply, made the wholesale price as high as $60 per dozen. It is found in salt marshes along the coast from New Jersey to Texas. While a few are obtained commercially from Delaware and southern New Jersey, the main supply comes from the South Atlantic and Gulf Coast States. The average weight is about 4 pounds, with a maximum slightly over 6 pounds.

Fresh-water terrapin are used as a substitute for the more highly valued "diamond-back," principally along the lower Mississippi. The species used most commonly for food are the "red-bellied terrapin" (*Pseudemys rugosa*), the "mobilianer" (*P. mobiliensis*) and the "yellow-bellied terrapin" (*P. scabra*).

The common method of taking diamond back terrapin is by "probing." The fishermen wade through the mud along the borders of salt lagoons or marshes, probing in the soft mud with a pointed stick. Fresh-water terrapin are often caught in fyke nets or taken by hand. Drag nets, haul seines, and dip nets are also used in catching terrapin.

Diamond-back terrapin is canned in Maryland and at one time small amounts were packed in Georgia. Some terrapin is still canned in Louisiana, utilizing the fresh-water species. Though packed commercially, canned terrapin is not an important product. The following formula for canning terrapin stew was given by Cobb (1919):

24 terrapin	6 doz. egg yolks, hard boiled
10 lb. butter	12 pt. sherry

When ready for canning the terrapin are washed and plunged alive into salted boiling water, and cooked until the toenails and outer skin come off readily. When they are removed, the terrapin then are placed in clear salted boiling water and cooked until the legs are quite tender. They should then be cleaned the same as snappers except that the small intestines are saved and cut into very small pieces.

The cut meat, together with the intestines, liver, eggs and liquor is then placed in a kettle together with 10 pounds of butter. This is brought just to a boil, and the egg yolks, which have been mashed and creamed with 12 pints of sherry wine, are added. The prepared product is filled in No. 1 cans and processed for 50 minutes at 250° F. (15-lb. pressure).

FROG LEGS

Small quantities of frog legs are canned commercially in the Gulf of Mexico and Mississippi River areas. As a rule, the hind legs only are canned, the meat from the fore legs and body being utilized in the preparation of specialty dishes similar to chicken à la king. Information is not available in the canning of "frog à la king," although a limited amount is canned commercially. Both common or "giant" bull frogs (*Rana catesbeiana*) and the smaller green frogs (*R. clamitans*) are used. The frogs are taken in the coastal bayous and river marshes by "torching" at night. A bright light is placed in the bow of a canoe or skiff. Frogs are attracted or dazed by the light so that they may be approached near enough to be taken by spearing, or in a dip net. Some are brought in alive. Frogs are said to be best from August through October.

The hind legs are separated from the rest of the body; the edge of the skin at the top of the legs is loosened, turned downward and pulled off over the toes, which are then cut off. The legs are soaked 15 minutes in a brine testing about 50° salinometer, after which they are washed thoroughly in cold water.

The legs are next drained and placed in a kettle with sufficient meat stock to cover. They are parboiled for 8 minutes, the stock is drawn off and the legs are packed in cans, usually No. 1 picnic (211 x 400), and squat (307 x 208) cans. The legs should be filled in carefully so that a good fill is obtained, with no large spaces. The fill-in weight of frog legs should be approximately 8 ounces for both sizes of container.

The cans are filled with the hot meat stock, leaving a headspace of $\frac{3}{16}$ inches, and are sealed immediately by closing machine without exhaust or mechanical vacuum seal. The process for both sizes is 45 minutes at 240° F. (10-lb. pressure). The product is water-cooled in tanks after processing.

CRAYFISH BISQUE

This specialty product is canned commercially in Louisiana and Mississippi, and is sold by grocers dealing principally in fancy

foods. The packing method is an adaptation of the kitchen procedure. Each packer uses a secret formula, usually based on a family recipe. The following is typical:

10 lb. fresh water crayfish	6 slices dried bread
6 large onions	4 oz. flour
6 oz. butter	1 can tomatoes (No. 1 size)
½ cup olive oil	1 can chicken consomme (No. 2 size)
2 cloves garlic	3 qt. water
1 tsp. minced parsley	2 bay leaves
$\frac{1}{16}$ oz. black pepper	4 cloves

Cayenne and thyme, a dash

Ten pounds of fresh water crayfish are purged in a 30° salinometer brine for 15 minutes. They are then washed thoroughly and the shells are cleaned with a brush. The crayfish are boiled in 3 quarts of fresh water until they are red, or about 5 minutes. The heads are removed and cleaned; the tails are peeled and the meat is set aside. The claws are cracked with a hammer after which heads, claws and shells are put back into the water to simmer.

A dressing is prepared as follows: Six large onions are minced fine and cooked in 2 ounces of butter until soft but not yellow. Six slices of dried bread are soaked in water and the water squeezed out. The bread is mixed thoroughly with the onions and cooked 10 minutes over a low fire. The meat from the tails is chopped fine and added together with $\frac{1}{16}$ ounce of black pepper, 2 cloves of garlic minced fine, and 1 teaspoon chopped parsley. The mixture is stirred well, cooked for about 10 minutes and salted to taste.

For a bisque, ¼ pound of butter is blended with ¼ pound of flour until the mass is smooth and cooked over a low fire until the mixture is brown. The contents of a No. 1 can of tomatoes and the strained liquid in which the shells have been simmered, is added gradually. A No. 2 can of chicken consomme is added, together with 2 bay leaves, 4 cloves and a dash each of cayenne and thyme. The bisque is simmered slowly for about 20 minutes.

While the bisque is simmering, about three-fourths of the heads are filled with the dressing and fried in olive oil for 3 to 5 minutes. About 12 heads are packed in each No. 1 picnic (211 x 400) cans or about 4 ounces by weight. The cans are filled with the hot bisque and sealed immediately. Accurate processing data are not available but it is understood that a process of approximately 35 minutes at 240° F. (10-lb. pressure) is used and that the pack is water cooled. The usual declared weight is 10½ ounces.

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