Post-harvest, processing

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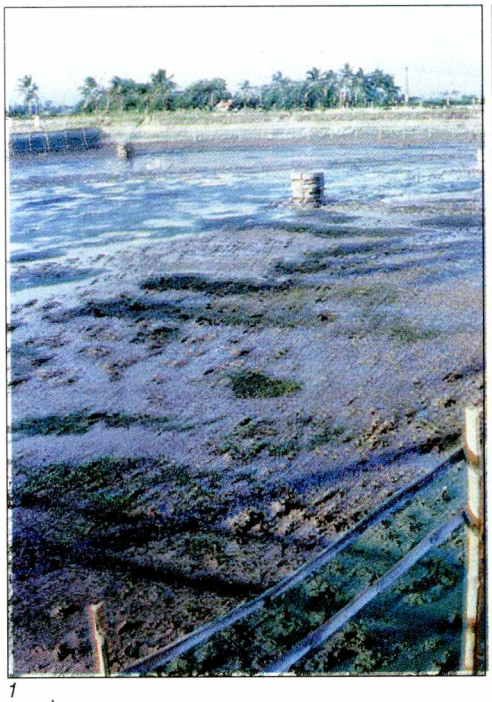

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Harvesting mudcrab *in EB Magalona, Negros Occidental. After the Montelibano fishpond has been drained (1), a catcher scours the still soaking floor gingerly for mudcrab, and collects these in a basin (2). The pinchers are then tied (3), after which mudcrab are weighed and packed according to size.*

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After harvest, mudcrab are bound with coarse twine to render claws immobile. Crab are usually stored underwater until enough have been accumulated to reach full cargo load /capacity for transport to market.

Crab mortality varies: 40% if transported by sea, 5-10% if transported by air. To reduce mortality, keep relative humidity at 95% and temperature between 16 to 20°C. Use ventilated, insulated polysterene containers instead of cardboard boxes.

Crab may survive for 17-18 days when cotton soaked with seawater is used to cushion the crab. Since cotton is expensive, moist wood shavings may be substituted; in this case, crabs may live up to 7 days.

Wholesale / retail storage

Almost all restaurants and wholesale outlets for crab hold them underwater inside display tanks with biological filters. Temperature is kept around 18°C.

Note that dehydration significantly affects survival. Do not subject crab to dry air or expose them to sunlight for long periods.

Crab processing

Fresh, frozen and processed crab and crabmeats are becoming an important component of the export trade. This is especially true of canneries engaged in packing tuna, shrimp or clams. With crab products becoming more economically valuable, specialty companies have emerged, engaged in frozen block and value added products.

Fresh crabmeat. A large portion of mudcrab is sold live in local markets. It commands the highest price among all the marine crabs.

Frozen crabmeat. Frozen crab is processed in whole, halves or block forms. They are generally destined for most international markets or distribution centers such as Singapore or Hong Kong. Japan is the main importer of frozen whole and halves.

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Freezing in Asia is done by blast freezer / plate method; recently, however, there has been a sharp increase in individually quick frozen (IQF) processing. Primary processing occurs at the village or cottage industry level. There is some movement towards established crab landing sites to facilitate access to plants; these plants usually conduct their own bacteria sampling for *Salmonella* and coliforms. Such sites employ hundreds of women to pick crab meats, which are separated into claw, body and lump meats.

In a large processing plant, crabmeat is first separated and blocks plate-frozen, either in trays or by IQF processing. These are then packed in sealed plastic trays within a cardboard box, and shipped in containers.

Block meat tends to be bland in taste. So, a study was conducted on freezing whole uncooked crab. Palatable crabmeat can be produced by preheating crab in steam for 4 min, chilling quickly in ice for 15 min, vacuum-freezing, then rapid freezing. Alternately, crab may be starved for 24 hours before processing; but it is best to separate the crab to minimize cannibalism.

Once quality control and packaging meet global standards, block meat will become more popular in markets worldwide.

Canned crabmeat. The Asia-Pacific region supplies over half of the world's production of canned shellfish. Canning with crabmeat includes two major processes: cooking the whole animal and extracting or picking its meat. Canning is labor-intensive and women are the primary laborers in picking meat.

Crab cooked live soon after harvest make the best quality product. Heat destroys the enzymes that hasten decomposition. Some crab are boiled on-board boats in seawater while others are cooked on-shore and chilled until ready for picking. Asian crab picking is similar to the US method -- crabs are backed, declawed, cleaned and the meats extracted. Separated into claw, body and backfin components, meat are either placed in plastic bags or small containers. Meat are placed in a cool place until delivery to processing plants.

At the plant, a random sample of meat is sorted and inspected for shell and foreign matter. Black lights are used quite often during this procedure. Many plants will also reboil or blanch the meat to ensure proper cooking.

In canning, blanched crabmeat are placed in 170 g lacquered cans which have been previously checked for defects. Usually, the meat are mixed in the retort cans, 75% white meat with a layer of leg and claw meat on top. Meat are topped with brine containing 0.1-0.5% citric acid. Brining maintains pH level at 6.3. Cans are vacuum-sealed and cooked in a retort for 60 min depending on temperature, and then packed in a master carton of 24 each.

Canned crabmeat may become blue or blackened. This may be due to natural coppers and amino acids in crab flesh or caused by the retort heating process. Blackening may be minimized by placing crabmeat in a solution of sodium metabisulphate, and dry-blanching. If not, wash the cleaned carcasses of crab thoroughly in running water to lower the copper content.

Cooking tips

Fresh crab may be cooked in boiling water or steamed for about 30 min. If seawater is not available, cooking salt is added to tapwater (25 g per liter). The water may be seasoned with sliced lemon, black pepper, celery, garlic and onion. A couple of tablespoons of vinegar makes the cooked crab easier to pick.

A more ambitious dish is shown below.

Crab and mushroom in wine sauce

450 g crab meat
100 g sliced mushrooms
2 T butter
2 T butter to sauce fresh mushrooms
1/2 cup milk
1/2 t dry mustard
1/2 t dry tarragon
salt, pepper and hot sauce to taste
1/4 cup bread sauce
1/2 cup white wine

Saute mushrooms in butter. Make a cream sauce, blending melted butter, flour and milk, wine, mustard, tarragon, salt, pepper and hot sauce. Cook for 2-3 min, then add crabmeat and mushrooms. Place in casserole. Sprinkle top with bread crumbs and dot with butter. Bake uncovered at 200°C for 30 min. Cover before serving. Makes four servings.

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Do not trash crabshells!

Crabshells have found their way into mass production of high-technology products such as non-allergenic contact lenses, artificial skin, drainage pipe pollutant removers, and wastewater filters in the textile industry.

The Pacific Institute of Bio-organic Chemistry, USSR Academy of Sciences, notes that crabshells contain the polymer chitin and its derivative chitosan. These are used in making non-allergenic contact lenses. The production technology developed by the Institute is reportedly unparalleled in the world. Two Soviet pilot plants are now mass-producing chitosan.

On the world market, 1 kg chitosan costs US$200. The present world demand in chitin and chitosan is said to be 1,000 tons annually.

Crabshells are also good sources of **artificial skin**. This is according to Japan's leading textile manufacturer Unitika Ltd which reported its success in producing a new type of artificial skin for humans using chitin. This causes fewer side effects as against dehydrated frozen pig skin or collagen made from animal protein.

Since chitin is found in large quantities in human blood, the substance generates almost no bodily reaction.

Crabshells can also be used as **wastewater filters** for the textile industry. This was reported by the researchers at North Carolina State University - College of Textile. Researcher Samuel Hudson said that chitin when combined with calcium can decolorize a lot of waste products. The researchers reportedly dyed 5 million pounds (2.3 million kg) of fabric a day and discharged more than 64 million gallons of wastewater. This is good news to seafood plants because disposal of crabshell is their problem. - **E Aldon**

postscript

The future of the mudcrab industry looks very promising. For fishfarmers / entrepreneurs, the mudcrab market is one sure 'given' they need not worry about. In terms of production, the technology for mudcrab aquaculture is almost complete. There are already techniques for grow-out culture in brackishwater ponds and in netcage culture in mangrove areas. Techniques for broodstock development and management, however, are still being studied but AQD reports very promising results. Ditto for larval rearing techniques. For now, fishfarmers have to rely on mudcrab juveniles caught from the wild to stock grow-out ponds. Researchers say that unless there is a reliable hatchery technology for production of juveniles, the mudcrab industry will not be able to take off.

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