

FACTSHEET No. 5

SHELLFISH FARMING

In the UK crayfish and molluscs are farmed. There are more than 500 farms in the sea around our coasts farming molluscs. Crayfish farms, of which there are about 70, are found inland in fresh water. Most slaughtering methods are horrendous, including boiling alive, and as with fish, these animals are not covered by welfare legislation.

Bans on fishing in the waters around the Orkney Islands are frequently imposed because of high levels of naturally occurring paralytic shellfish poisoning toxin. These toxins are caused by algae in the sea and calls have been made for the Government to research into the reasons for the occurrence of these algae blooms.

There have been public rows over the use of chemicals like ivermectin and cypermethrin and the siting of bigger fish farms. The Association of Scottish Shellfish Growers (ASSG) has stated that it respects the environment and works to maintain the purity of that environment. To damage it would mean damage to the product and the market.

Oysters: these animals have been cultivated since Roman times. Production of the Pacific oyster (non-native) rose to 2.8 million in 1996, with eight companies producing 72% of that total, according to Scottish Office figures. There was, however, a 47% drop in native oyster production, with nine companies producing 96,000 of the species.

The Pacific oyster is cultivated from seed stock from warm-water hatcheries, the seed bought in from eg the USA. From start to harvest takes 2-4 years. 'Natural' (as opposed to cultivated seed stock) oysters are based on on-growing of juvenile stock taken from the wild. Oysters feed themselves, suspended closely confined in nets and trays from a raft, or in trays set on trestles or stacks on the sea bed. Most of what is eaten of the oyster – live – are the gonads. The ASSG is looking at methods of suspended oyster cultivation from mussel rafts, and it has been stated that the need for greater product yields is encouraging oyster farmers to use mechanical grading for the oysters. It is thought that as long as the animals are graded and returned to the sea bed within 24 hours, mortalities should be low.

Scientists in France are trying to genetically-engineer oysters (in an attempt to make them resistant to disease, which of course is a problem, in close-confinement, in sacks on an oyster farm). Asked about the risks of such genetic engineering, the Director of the research programme replied that no-one knows exactly if there is a danger from the genetically altered oysters and, if there is one, where it is. It is planned to control them in a limited, confined environment and to make them sterile. He added that after four or five generations, they will return to their natural, unaltered state'. The director did not make clear how these *sterile* oysters would return to their natural state after four or five *generations*! (Thanks to Compassion In World Farming, CIWF, for that).

Mussels: these are farmed in two different systems;

Long-line, raft and bottom-culture (mud) systems. Seed mussels are bought in at between 10 and 20mm. The raft might grow up to 100t of mussels, with 800 growing ropes and 200 seed-collector ropes suspended to 15m depth. In recent years the animals have been grown in the French 'cotton tube-sock', which has proved to be the most efficient method of raising crop productivity. It seems that by using this method the small mussels can be recultivated on pegged ropes rather than being discarded as was previously the case. They reach market size at 18-24 months.

Mussels naturally root to the sea bed by the byssus or beard. At low tide, when they are exposed to the air, they clam up. When they are covered they open up to siphon water through the body at 1 pint every 15 minutes, filtering out food particles but taking in any toxins. When these are harvested at about 2-3 years they are purified in salt water for 36 hours. Mussels are sold live and cooked-killed by steaming.

Scallops and Queens: UK production is about 10t a year. Natural stock of these creatures is in lantern nets at about 100 per metre sq. in the final year, or they can be laid out on the sea bed. This takes place between 2 and 5 years old. The growing process can involve being drilled for 'ear-hanging'; hooked through a drilled hole to hang on string or nylon lines. One company has developed a drilling machine which can ear hang scallops accurately at a rate of one thousand per hour. A portable version of this machine has been developed, and the company has received orders from many countries. The animals are killed by having the shell prised open with a knife, and then being boiled or steamed, and the viscera removed.

Clams: there are about 4 farms in England which produce approximately 100t a year, from hatchery-produced seed. There are about 2 Manila clam farms in England, producing 0.16t a year, also from hatchery-produced seed.

Winkles: these creatures are not farmed as such, but Scottish Natural Heritage (SNH) say that winkles are Scotland's sixth-largest shellfish business after the trades in different types of scallop, crab and lobsters, with well-established picking operations around Argyll, Sutherland, eastern coasts and the Hebrides. Officially, pickers land well over 2,000 tonnes across Scotland, and some buyers believe the true figures could be double that, with 90 tonnes a week being picked. Winkles are now being heavily over-exploited because travellers and holiday-makers routinely pick winkles during the summer. This interferes with the winkle breeding patterns by harvesting them when they are too small. Since winkles are so plentiful nationwide, they do not have legal protection and will probably re-establish themselves after a few years, but a spokesperson from the local SNH office said that people should look for long-term sustainability rather than short-term profit.

Prawns: There are prawn fisheries in the deep waters to the west of the Hebrides as well as in the Fladen area. It is, however, prawn farms in the Third World that are causing environmental problems. The promotion of intensive prawn aquaculture in mangrove forests in many tropical and sub-tropical countries in Asia, Latin America, Australia and Africa are partly responsible for the alarming loss of the wide variety of marine life, animals and birds that depend on these forests, which are specially adapted to survive in brackish and saltwater environments. In Thailand, for example, prawn farming was responsible for the destruction of over 64% of land lost until

1986. This encroachment of the land is still continuing, despite laws banning prawn farming from many mangrove areas.

Apart from destroying the mangroves, the waste from prawn farms, which consists of dangerous chemicals and antibiotics, has also polluted coastal water, fresh water canals, productive agricultural lands and ground water supplies. This pollution eventually causes the farms to close down, leaving the farmers to live on the unproductive lands.

Japan is the highest importer of the cultured prawns from southeast Asia, while the high demand for prawns in the US market, which generally come from Ecuador's farmed prawns, is causing the competitive exporters to increase productivity. This easy money from prawn aquaculture is tempting other countries to fall into the same trap – environmental impoverishment, followed by poverty. Cultured prawns include 'black-tiger', 'jumbo', and 'white' prawns.

Crayfish: Most of these animals are farmed in the south of England, producing mainly the non-native signal crayfish (from the USA and Australia). Production for the table is 4-7t a year. Each fish weighs approximately 70-100g at 1-3 years.

Crayfish mate in Autumn and the female can lay up to 300 eggs, four to five days later. The females are put into mesh cages for when the eggs hatch in late Spring. The juveniles moult after 6-8 days, and cling to the female until the second moult, when they leave the mother, who is then released back into the pond. The juveniles moult again several times, and then only two to three times a year until they are mature. USA research forces moulting rates by hormone feed, injection, water bath and ablation (removal of moult-inhibiting eye-stalks). The animals are stocked in water-flow or static ponds, gravel pits or canal channels, and are fed on natural sources of crustacean and vegetable matter, supplemented with potato, carrot and trout pellets.

The more favoured method of crayfish culture is ranching, which stocks ponds etc. with the creatures, letting them breed and multiply naturally, harvesting the surplus. They find their own food, the age groups are not separated and spawning is not controlled. A far greater degree of control is exercised in semi-intensive or intensive farming. Some British farms are now producing seed for stocking purposes. The newly hatched young are best for this as they adapt most readily to their new environments. Sometimes crayfish and carp are farmed in the same pond to enhance profits.

Harvesting takes place after three summers' growth. Plastic, lobster-pot type traps are generally used. Crayfish ponds can be sited in areas of poor farmland, and intensive stocking can produce a relatively high income yield. Ranching, however, produces more modest profits, and some farmers use their crayfish ponds for such things as attracting wildfowl for shooting.

The British Crayfish Marketing Association (BCMA) co-operative has established two grades of crayfish, the premium and the standard grades. Prices are fixed at the beginning of each season. The animals are sold live and killed by boiling.

Crayfish plague has been mainly responsible for the depletion of the native, smaller crayfish, and it is still disputed that the larger signal crayfish have been responsible for the spread of the disease, since they can be carriers, but are themselves immune.

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