

Editorial

Removal of nitrogen by an aquatic plant, *elodea densa*, in recirculating macrobrachium culture systems

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EDITORIAL NOTE

Aquaculture (less commonly spelled aquiculture), also known as aquafarming, is the farming of fish, crustaceans, mollusks, aquatic plants, algae, and other organisms. Aquaculture involves cultivating freshwater and saltwater populations under controlled conditions, and can be contrasted with commercial fishing, which is the harvesting of wild fish. Mariculture commonly known as marine farming refers to aquaculture practiced in marine environments and in underwater habitats, opposed to in freshwater.

According to the Food and Agriculture Organization (FAO), aquaculture “is understood to mean the farming of aquatic organisms including fish, molluscs, crustaceans and aquatic plants. Farming implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators, etc. Farming also implies individual or corporate ownership of the stock being cultivated.” The reported output from global aquaculture operations in 2014 supplied over one half of the fish and shellfish that is directly consumed by humans; however, there are issues about the reliability of the reported figures.

Further, in current aquaculture practice, products from several pounds of wild fish are used to produce one pound of a piscivorous fish like salmon.

Particular kinds of aquaculture include fish farming, shrimp farming, oyster farming, mariculture, algaculture (such as seaweed farming), and the cultivation of ornamental fish. Particular methods include aquaponics and integrated multi-trophic aquaculture, both of which integrate fish farming and aquatic plant farming. The Food and Agriculture Organization describes aquaculture as one of the industries most directly

affected by climate change and its impacts. Some forms of aquaculture have negative impacts on the environment, such as through nutrient pollution or disease transfer to wild populations.

The farming of fish is the most common form of aquaculture. It involves raising fish commercially in tanks, fish ponds, or ocean enclosures, usually for food. A facility that releases juvenile fish into the wild for recreational fishing or to supplement a species' natural numbers is generally referred to as a fish hatchery. Worldwide, the most important fish species used in fish farming are, in order, carp, salmon, tilapia, and catfish.

In the Mediterranean, young bluefin tuna are netted at sea and towed slowly towards the shore. They are then interned in offshore pens (sometimes made from floating HDPE pipe) where they are further grown for the market. In 2009, researchers in Australia managed for the first time to coax southern bluefin tuna to breed in landlocked tanks. Southern bluefin tuna are also caught in the wild and fattened in grow-out sea cages in southern Spencer Gulf, South Australia.

A similar process is used in the salmon-farming section of this industry; juveniles are taken from hatcheries and a variety of methods are used to aid them in their maturation. For example, as stated above, some of the most important fish species in the industry, salmon, can be grown using a cage system. This is done by having netted cages, preferably in open water that has a strong flow, and feeding the salmon a special food mixture that aids their growth. This process allows for year-round growth of the fish, thus a higher harvest during the correct seasons.

An additional method, known sometimes as sea ranching, has also been used within the industry. Sea ranching involves raising fish in a hatchery for a brief time and then releasing them into marine waters for further development, whereupon the fish are recaptured when they have matured.

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