HATCHERY, ON GROWING TECHNOLOGY AND ENVIRONMENTAL MONITORING OF OPEN OCEAN AQUACULTURE OF COBIA (*Rachycentron canadum*) IN THE CARIBBEAN.

Daniel Benetti, Brian O’Hanlon, Larry Brand, Refik Orhun, Ian Zink, Philippe Douillet, James Collins, Christopher Maxey, Andy Danylchuk, Dallas Alston, Alexis Cabarcas

Aquaculture Program - RSMAS - University of Miami
4600 Rickenbacker Causeway, Miami, Florida 33149, U.S.A.
DBenetti@rsmas.miami.edu

The offshore aquaculture industry is in its infancy in the Caribbean. Due to its extraordinary growth rate, one of the species identified as having the greatest potential for commercial aquaculture in the region is cobia (*Rachycentron canadum*). Advances in hatchery and on growing technology of cobia from egg to market are presented and discussed in this paper. New hatchery techniques include conditioned spawning of broodstock and intensive and semi-intensive larval rearing of cobia in tanks and ponds using probiotics. Emerging technology is being used to demonstrate the viability of raising hatchery-reared cobia in collaboration with the private sector (Snapperfarm, Inc. and AquaSense LLC) using SeaStation (Net Systems LLC) submerged cages in exposed sites in Puerto Rico (US) and the Bahamas. The University of Miami and the University of Puerto Rico conducted environmental monitoring in both operations. Sampling stations were set up at different distances and directions from the fish cages. Possible eutrophication of the local environment was evaluated monthly by measuring dissolved nitrogen and phosphorus, phytoplankton biomass, epiphyte growth potential, sinking flux of organic matter into sediment traps, organic content of the sediments, and benthic microalgal biomass. In all cases, no significant differences were found as a function of distance from the cages or relative to upstream-downstream direction. Environmental data from Puerto Rico and the Bahamas indicate that the current regime and resulting dilution of nutrients from the submerged cages do not lead to a significant change in the ecosystem near the cages.

Within stocking densities ranging from 5-15 kg/m$^3$, evidence to date indicates that cobia’s growth, mortality and food conversion rates (FCR) are directly related to stocking densities. Growth and survival rates decrease dramatically at higher stocking densities. As a consequence, FCR increases and smaller fish (≤ 4 kg) command lower market demand and price. Under ideal conditions (i.e., at low stocking densities and adequate temperature range of 26-30°C), cobia exhibit extraordinary growth (4-6 kg/12 months), yielding 1 kg of fish biomass when fed 1.8 kg of pellets containing 50% fish meal (FCR = 1.8). Taking into account that energy loss between trophic levels in nature results in an ecological efficiency of only around 10%, our data shows that using fishmeal to produce high-value fish for human consumption in aquaculture can be 3.7 times more efficient than this transformation in nature. The most important problem faced thus far was shark predation leading to major production loss both in Puerto Rico and the Bahamas. For this reason, combined with high capital and running costs, the economic viability of the open ocean aquaculture operations in the Caribbean has not been reached yet.
Cobia Aquaculture Todd Shomber. 2 Taxonomy Family: Rachycentridae Rachycentron canadum. 3 Quick Facts: * Other names: Lemon fish and Ling. * More are caught by Rec Fishers than Commercial boats. Diet: Crabs, Fish, and Squid. *Growth up to 72in or 1.82 meters and weight up to 135lbs. *Habitat: All structure types but mainly found around floating objects offshore. 4 Andâ€¦!!!!! Research needs to improve in the areas of larval and juvenile growing and survival rates, but the Cobiaâ€™s fast growth and high price tag are advantages that are not easily ignored. 29 Before I leave youâ€¦â€¦â€¦.. 30 Are we sure our teacher isnâ€™t a pro wrestler with the name Hugh Hammer? Open Sea Aquaculture in Panama: An Assessment of Cobia Production by Pristine Oceans. By: Chloe Stemler. Because the technology and practice of open sea aquaculture is very recent, careful monitoring of changes will be very important to avoid potential environmental problems. The ultimate goals of this report are to introduce the current state of aquaculture in Panama, describe the operation conducted by Pristine Oceans, and assess the potential impacts the project may have on the environment so recommendations can be made. Aquaculture for raising cobia has been largely successful in Taiwan and is now being expanded into the Caribbean and the Americas where hatchery and open ocean cage technology is being perfected. The cobia are then transferred to open ocean cages for final the grow-out when they reach 6â€“10 kilograms.[5][7] The growth rate and survival rate of cobia during grow-out stages in open water cages throughout the Caribbean and Americas vary from as little as 10% up to 90%.[17] Low survival rates are mainly due to disease, but also to shark attacks which tear holes in the nets of cages in the Bahamas and Puerto Rico and allow caged cobia to escape. However, better growth rates were experienced in offshore cage farms in Taiwan.[2] In addition, cobia are considered to be gonochoristic, with diffe... "Advances in hatchery and grow-out technology of cobia Rachycentron canadum (Linnaeus)". Aquaculture Research.