Korean rockfish production

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Cultured centered in Gyeongsangnam-do, the southeastern part of Korea

Most Korean rockfish are cultured in net cages off the Korean coast.

The Korean rockfish seems to be specifically a Korean species. According to the database of the Food and Agriculture Organization of the United Nations, Korea accounted for all the global Korean rockfish production in 2006, although countries such as Canada, the United States and Nigeria produced other species of rockfish in the statistical year. Production of the Korean rockfish (*Sebastes schlegeli*) ranked it second among Korean mariculture finfish species in 2007.

The bulk of the Korean rockfish is produced through aquaculture. Of the 39,601 metric tons (MT) of Korean rockfish produced in 2007, 35,564 MT or 89.8 percent came from aquaculture, while only 4,037 MT were capture production (Table 1). For over a decade, aquaculture has contributed over half of the total Korean rockfish production.

Bai, Korean rockfish production, Table 1

	1996	1997	1998	1999	2000	2001	2002	20043	2004	2005	2006	2007
Culture production (mt)	2,036	12,430	14,634	10,180	8,698	9,330	16,636	23,771	19,576	21,297	27,517	35,564
Capture production (mt)	1,854	1,813	2,092	1,813	2,682	2,765	3,227	3,811	3,774	3,000	3,713	4,037
Culture value (U.S. $, millions)	16.29	62.15	75.46	79.51	68.70	54.71	73.54	164.95	175.52	197.33	187.18	197.55

Table 1. Korean rockfish production, 1996 to 2007.

The desirable culture characteristics of this species include high tolerance to water temperature changes, ease of fry production due to the ovoviviparous reproductive system of the fish and the ability to withstand high stocking density.

Since the development of commercial culture systems for Korean rockfish in Korea in 1987, production of this species increased rapidly. No production statistics were available before 1993. In 1993, the Korean rockfish production was 679 MT. As shown in Table 1, volume increased to 2,036 MT in 1996, peaked at 14,634 MT in 1998 and fluctuated until 2004. Since 2004, the production consistently increased.

Production areas

Most of the Korean rockfish is cultured in Gyeongsangnam-do, the southeastern part of Korea. The region contributed 24,273 MT or 68.25 percent of the country's output in 2007. This was followed by Jeollanam-do, a province in the southwest, with production of 7,375 MT or 20.74 percent. Other production areas included Gyeongsangbuk-do, Chungcheongnam-do, Ulsan, Busan, Gyeonggi-do and Gangwon-do.

In terms of Korean rockfish aquaculture production value, Gyeongsangnam-do played the leading role in 2007 by generating $122.14 million or about 62 percent of the $197.55 million total. Jeollanam-do produced $48.07 million. Contributions from the other production areas totaled about 14 percent of the overall production.

Seedstock production

Hatcheries produce Korean rockfish seedlings in cylindrical or rectangular indoor tanks. Mature fish of 30- to 40-cm length give birth during April and May to 100,000-200,000 larvae.

At 5.7 mm, early larvae are relatively big and start feeding shortly after birth. For the first 10 days, they are fed rotifers at a density of 10 individuals/ml. From 11 to about 30 days after birth, artemia are fed at the density of 1-3 individuals/ml. Mixed feed with gradually increasing particle size and quantity is supplied from the third day after birth. The live food, rotifers and artemia should be enriched with *Chlorella* algae.

The population density is 5,000 to 7,500 larvae/m^3. When fry reach a size of 2 cm, population density of 2,300 larvae per cubic meter is appropriate. When they reach 3 cm, the density should be reduced to 2,000 larvae per cubic meter. Great variation in fish size can lead to cannibalism. Hence, sorting and grading of fish is necessary. Fingerlings are sold when they are 5 cm long.

Culture systems, practices

Korean rockfish are mainly cultured in net cages, although some are raised in ponds. The cages are typically 5 m x 5 m or 10 m x 10 m. Seedlings are raised to weights of 500 grams to 1 kg in 18 to 24 months in these systems. The population density is 700 to 1,000 fish per cubic meter at sizes of 4 to 5 cm and 300 to 500 fish per cubic meter at lengths over 8 cm.

Korean rockfish grow well at relatively low water temperatures. Hence, water should be exchanged more often and population density reduced to half the normal level during summer. Fish should be fed two or three times daily when they are young with the feeding rate and frequency reduced depending on the growth of fish. They are usually fed once or twice a day by the time they are ready to be sold. During the winter with low water temperatures, it is advisable to feed fish every other day depending on water temperature.

Diseases

Korean rockfish are prone to infection in the summer, when the water temperature is relatively high. To prevent diseases, feed must be fresh, and feeding may be temporarily stopped. Viral infection can be prevented by maintaining appropriate population density and implementing immediate responses such as supplemental aeration and use of medication when necessary. Medications must be used with caution, as misuse can negatively impact the immune systems of the fish.

Challenges, future prospects

The Korean rockfish aquaculture industry is expected to continue to grow, both in quantity and value. However, it faces challenges that include problems associated with live food organisms, pollution, high production costs, low profits due to overproduction and reduced seedling quality.

Research to substitute natural live foods with microfeeds is in progress. Research also continues in the area of immunology, especially with the goal of improving seedling quality.

Proper timing of shipments, production and supply control agreements among companies and advertising could help improve poor pricing and increase profits. As in other aquaculture sectors, the development of efficient, low-pollution feed will help Korean rockfish aquaculture be more environmentally friendly.

(Editor's Note: This article was originally published in the January/February 2009 print edition of the Global Aquaculture Advocate.*)*

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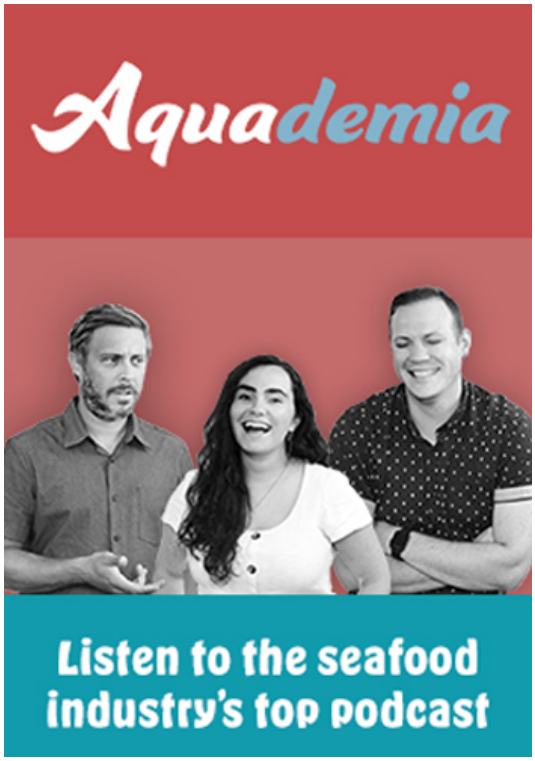

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