

Potential new species in the Kingdom of Saudi Arabia: Sabaki tilapia (*Oreochromis spilurus*)

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Sabaki tilapia.



Broodstock.

The story of Saudi aquaculture industries

The accumulated reference suggests that due to economic development, market demand, and environmental factors, shrimp farming has been highly prosperous in the Kingdom of Saudi Arabia since the 1990s. In the beginning, the main cultivated species was the Indian prawn (*Fenneropenaeus indicus*). However, because white spot syndrome virus (WSSV) hit in 2010, the Saudi aquaculture industry started farming white shrimp (*Litopenaeus vannamei*) to cover the production shortage. Currently, shrimp farming in Saudi Arabia is still widespread because of the demand for global market.

Moreover, for the sustainable economic development of Saudi Arabia, the government set up the goals of Vision 2030. To make a long story short, we will only mention the goals about

aquaculture. In 2030, the Saudi aquaculture industries expect to produce a combined 600,000 tonnes. At present, the total aquaculture production of Saudi Arabia is around 55,000 tonnes of which shrimp farming makes up almost 60%; the main farmed fish species, Asian sea bass (*Lates calcarifer*), makes up 7,000 tonnes of total output.

To match the production goal, we need to find some new species to farm. Candidate species should be unique, easy to manage, low cost, have high market demand, and, most importantly, we hope everyone loves it!

According to biological factors such as fry, broodstock and farming environment, and economic considerations such as market, cost, and promotion, the fisheries authority chose Sabaki tilapia (*Oreochromis spilurus*) to be our promotional species.



Female broodstock.



Male broodstock.

Sabaki tilapia is not yet a popular commercial farming species. We have the opportunity to be a pioneer!

How do we manage the operations of Sabaki tilapia?

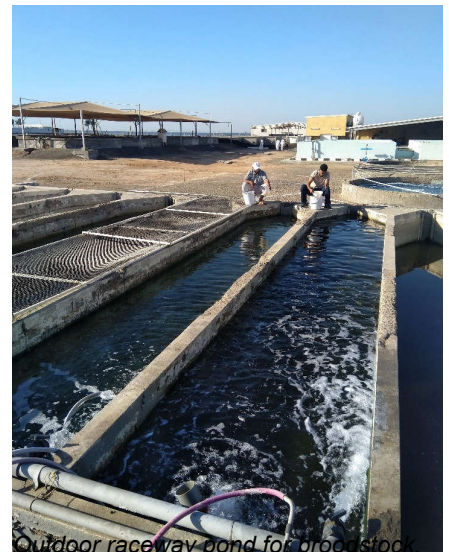
We introduced farm management of broodstock, fry, and grow-out, respectively.

Broodstock management

Qualified broodstock should be healthy, active, and free from disease. Moreover, the weight should be over 200g. We collected eligible broodstock of less than seven months, maintaining a sex ratio of 3 females : 1 male.

We have trialed three farming systems to understand the best result for the spawning, namely hapa net cages, raceways, and arenas, respectively. Our experience has been that the raceway and arena have superior fry production results than hapa net cages. The main reason is that the hapas needs higher management skills and costs.

We collect fertilised eggs every 15 days and produce fry every 21 days. A female can spawn 120 to 550 eggs in each period. The hatching rate is more than 95%. After spawning every 30 to 45 days we separate the male and female broodstock for a period to support their nutrition.



Outdoor raceway pond for broodstock.

Why do we choose this fish for development targets?

Expansion of tilapia aquaculture has the potential to create job opportunities, promote economic growth, is easy to operate, has relatively low production costs, and can improve food security.

Furthermore, among the various tilapia species, Sabaki tilapia is one of the distinct species in the global tilapia

aquaculture industry. Why makes Sabaki tilapia unique? First, Sabaki tilapia can be farmed in a high salinity and temperature environment. This is important because the average salinity in Saudi marine fish farms is over 42‰, so the tolerance of this species will assist with acclimatisation. Other common tilapia species farmed in saline environments, such as Java tilapia (*Oreochromis mossambicus*) are smaller than Sabaki tilapia, and yield lower value products due to shape, size and processing characteristics. Finally,



Hapa for broodstock..



21 day old Sabaki tilapia fry.

Larviculture

The fry of Sabaki tilapia are strongly cannibalistic. Therefore, 14 days after fry collection they must be graded. To save management costs and improve growth performance, we suggest that outdoor farming is a better choice for larviculture. Thus predator control is essential. When fry have reached 1 g they can be moved to the grow-out pond.

Grow-out management

Currently, several Saudi aquaculture companies have started running industry scale farms for Sabaki tilapia and the products are available on market. Current grow-out farming systems include marine cages, FRP tank, hapa net cages, and traditional ponds.

The challenge of farm management

Generally, the farming practices for Sabaki tilapia are not vastly different compared to other tilapia species. However, because of the unique farming environment in Saudi Arabia, the fishes are under high salinity (42‰) and temperature (37°C) in the production period. For this reason disease is frequently an issue, notably bacterial infections emerge in the winter season.



Above: Broodstock farming arena. Below: Outdoor raceway pond for larviculture.

