Pangasius (*Pangasianodon hypophthalmus*)

Pangasius, a member of the Pangasiidae family, is commonly referred to as basa, swai, or Vietnamese catfish. It is one of the most widely farmed fish species, especially in Southeast Asia. In 2020, global pangasius production reached 2.52 million tonnes, with Vietnam leading the way, producing 1.5 million tonnes from approximately 6,000 hectares of ponds. Other significant producers include India, China, Bangladesh, and Indonesia.

The pangasius production cycle begins with induced spawning, facilitated through hormonal injections to stimulate reproduction. The larvae are transferred to nursery ponds after about one month, where they remain for an additional two months. Once the juveniles reach a weight of 14–20 grams, they are moved to grow-out ponds stocked at densities of 60–80 fish per m^2. Due to its fast growth, pangasius can reach a market size of 800–1100 grams in just 6 to 8 months, making it a highly efficient species for aquaculture.

Pangasius feed consists primarily of grain-based ingredients with a low fishmeal content (around 5%). The dietary protein requirements vary by growth stage: 36–39% crude protein for early stages (0–20 grams), 31–29% for grower stages (20–250 grams), and 28–25% for final production stages (250–1000 grams). The low cost and wide availability of plant-based feed ingredients make pangasius an economically viable species to farm.

One of the key features of pangasius is its ability to breathe atmospheric oxygen through its modified swim bladder, enabling it to thrive in environments with low dissolved oxygen levels (as low as 0.1 mg/L). This adaptation allows for high stocking densities without the need for intensive aeration, making pangasius particularly well-suited for pond culture. The optimal water temperature for pangasius ranges from 22°C to 30°C, though it struggles with prolonged exposure to temperatures below 14°C. Common health challenges include protozoan infections such as white spot disease (*Ichthyophthirius multifiliis*) and *Trichodina spp.,* as well as bacterial diseases like bacillary necrosis (*Edwardsiella ictaluri*) and red spot disease (*Aeromonas septicaemia*).

Pangasius is renowned for its affordability and large-scale production, which allows it to be marketed at competitive prices globally. The average farm-gate price for pangasius fillets varies depending on the region, but prices typically range from USD 1.50 to USD 3.00 per kilogram, making it a cost-effective alternative to other whitefish species. Vietnam remains the dominant player in the international pangasius trade, with the European Union and the United States being major importers of pangasius products. The fish's rapid growth and low feed costs contribute to its cost-effectiveness, further solidifying its position as a key species in global aquaculture.

The rapid expansion of pangasius aquaculture has raised environmental concerns, particularly regarding water quality and the ecological impact of intensive farming. In response, the sector is moving towards more sustainable practices, including responsible antibiotic use and adherence to stricter environmental regulations. Despite these challenges, pangasius remains highly popular due to its low production cost, mild flavor, and competitive pricing in international markets.

References

1. Lefevre, S., Wang, T., Phuong, N. T., & Bayley, M. (2011). Hypoxia tolerance and partitioning of bimodal respiration in the striped catfish (*Pangasianodon hypophthalmus*). Comparative Biochemistry and Physiology Part A: Molecular & Integrative Physiology, 158(2), 207–214.
2. Jayant, M., Muralidhar, A. P., Sahu, N. P., Jain, K. K., Pal, A. K., & Srivastava, P. P. (2018). Protein requirement of juvenile striped catfish (*Pangasianodon hypophthalmus*). Aquaculture International, 26, 375–389.
3. FAO (2020). The State of World Fisheries and Aquaculture: Sustainability in Action. Food and Agriculture Organization of the United Nations.