



*Pangasianodon hypophthalmus*

Main producer countries of *P. hypophthalmus* (4)



The fish labelling regulations (1) designate that all species of the family Pangasiidae can be called panga, pangasius, basa, or river cobbler; and any of these names can be used with the addition of the word 'catfish'. Other names are striped catfish or tra catfish. One species *Pangasianodon bocourti* can be described as 'Royal basa'. Fishbase (2) lists 30 species of this family. The main species imported into the UK is *Pangasianodon hypophthalmus* (3).

The farming of *P. hypophthalmus* has seen it emerge as a commercial freshwater species that is now a significant component of global whitefish supplies. While trade in frozen products generally stagnated in 2007 and 2008, *P. hypophthalmus* was the exception, with trade increasing 311%, traded primarily as frozen IQF (Individual Quick Frozen) fillets. This species is now a highly competitive, high value white fish product on many markets (4). The EU is the largest market for pangasius, importing over 220,000 tonnes in 2009 (5).

Pangasius is by far the fastest growing retail seafood segment in the UK increasing by over 50% between October 2009 and October 2010. It currently holds a modest 0.5% market share, with an estimated annual value of £11.9m and a volume of 1,440 tonnes. However, Globefish estimates that 7,000 tonnes of pangasius fillets were imported into the UK in the first nine months of 2009 (5). Pangasius sales are expected to exceed those of crab and scallop by October 2011 driven by price - it significantly undercuts its whitefish competition.

**The purpose of this guide is to give buyers background information on the responsible sourcing of pangasius.**

#### BUYERS' TOP TIPS

It is vital the buyer is aware of flesh colour requirements (white, pink and yellow, also light pink and light yellow) before purchasing. Colour differences are dependent on the practice in the growing and processing operations (6).

Know your source of supply and only purchase pangasius which is traceable throughout its entire production chain.

Ensure product complies with the appropriate farming, processing and production standards.

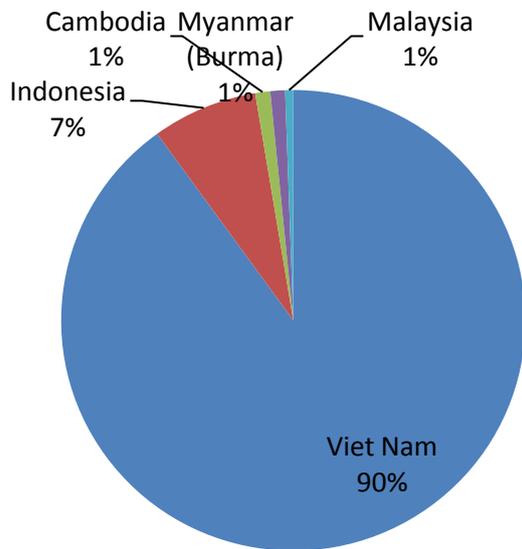
Understand the legal system for importing pangasius, and the testing requirements to ensure all product is free from drug and chemical residues.

Be aware of the social and environmental impacts.

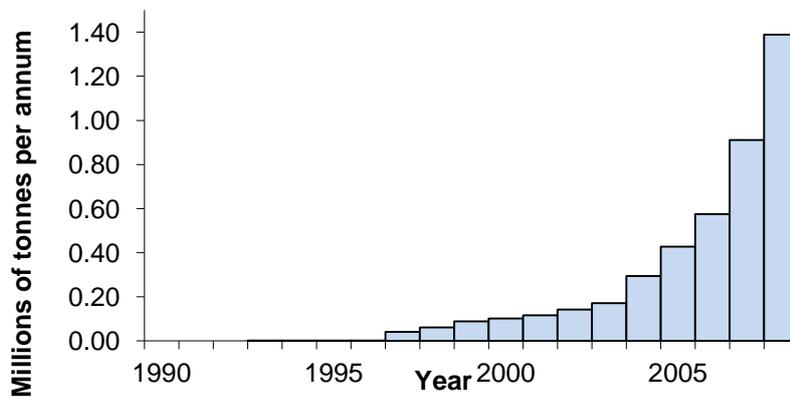
## Sources and quantities

*P. hypophthalmus* is native to the Mekong (Vietnam, Lao Peoples Democratic Republic and Cambodia), Chao Phraya and Mae Klong (Thailand) rivers and also the Ayeyawady basin in Myanmar (Burma). Vietnam dominates production (Figure 1) within the native range but there have been introductions into other Asian countries such as Bangladesh, India and China, although these production statistics may not be reported separately by species.

**Figure 1:** Total production of farmed *Pangasius* by country in 2008 (1,388,546 t) (FAO statistics).



**Figure 2:** Trajectory of total world production of farmed *Pangasius* 1980-2009 (FAO statistics).



## Biology and cultivation methods and systems<sup>(4,6)</sup>

Wild *P. hypophthalmus* is highly migratory, with migrations tied to the annual monsoon flood cycle. They spawn at the start of the monsoon season in May-June, in habitats consisting of rapids, sand banks and deep rocky channels and pools. The eggs are sticky and are deposited onto exposed tree roots in fast flowing streams. The fish make extensive feeding migrations into the Mekong delta during the flood season, which also act as nursery areas. In the dry season they congregate in deeper areas upstream. Wild fish can reach 130 cm in length and up to 44 kg in weight. They are omnivorous, and will eat algae, plants, zooplankton and insects, with larger specimens taking fruit, crustacea and fish. Typically they live in water with a pH of 6.5 - 7.5 and temperatures 22 - 26°C.

### Cultivation methods and systems

*P. hypophthalmus* are cultivated from eggs to fully grown fish in Vietnam. However, in Cambodia, Lao Democratic People's Republic and in some parts of Thailand farmers also rely on supplies of wild captured juveniles for on-growing (*this is not acceptable to all processors*).

Rearing from eggs to fully grown fish of 1-1.5 kg takes between 8.5 and 10 months. Adult brood stock are induced to spawn by hormonal injections, the eggs and sperm are mixed in water and tannin is added to remove the stickiness of the eggs which are incubated for 22 - 24 hours. The larvae are placed in nursery stage one ponds after 24 hours when they commence feeding. These earthen ponds are prepared by drying, liming and stocking with small crustaceans (*Moina*)

and filtered to exclude predators. The fish are fed on boiled egg yolk and soya bean meal for the first two weeks followed by feed pellets. At the end of this stage the 0.3 - 1.0 g fry are harvested by seine nets and transferred to a nursery second stage pond without *Moina*. Here the fish are kept for a further two months before being transferred as 14 - 20g fingerlings to the grow-out farms.

The most common on-growing monoculture system is earthen ponds, however net cages and net pens are also used:

- **Earthen ponds** sited near river tributaries which are aerated using paddle wheel and tidal exchange systems are the most popular.
- **Net cages** which are situated in the major river tributaries of the Mekong river delta, which sometimes have living accommodation situated above the cage.
- **Net pen** systems situated in shallow waters.

This species is able to air breath, so low levels of oxygen are tolerated, and it is able to tolerate low and variable water quality. However, the growing conditions can affect the flesh quality, with a yellow colour developing when the fish is kept in conditions where there is a shortage of oxygen. There are two main harvesting times; March and at the end of October, although harvesting can occur all year. The fish are harvested by net following partial drainage of the pond, or by raising the cage's netting and transferring the fish to the factories by well boat.

## Feed

Feeding during the on-growing period is generally with farm produced feeds made from a variety of components such as trash fish, soya bean oil, blood meal, rice, milk, eggs and vegetables with vitamin supplements. However, since 2008 there has been an increasing trend towards the use of commercial pellets comprising rice bran, maize and fishmeal. Although the pellets are more expensive, they result in better feed conversion ratios and water quality. They are also designed to float to avoid the build up of feed on the cage or pond floor. Some farms feed commercial pellets throughout the on-growing process, others only in the first and last month, whilst the fish are fed on farm made food during the middle period.

## Environmental considerations

Both environmental and economic pressures support the certification of aquaculture production. It is a process that allows a supplier to demonstrate 'responsibility' by: minimising impact on the environment; making the best use of locally available resources; making informed choices as far as labour rights in the third world; complying with national legislation and ensuring the best use of feed and therapeutic products.

The rapid growth of the pangasius aquaculture industry has raised a number of environmental and social concerns (7,8):

- Legal issues surrounding construction and operation;
- How new farms affect land and water use;

- Water pollution and waste management;
- Escapees may compete with wild fish and affect ecosystems;
- The use of fishmeal, fish oil and trash-fish in pangasius feed could deplete resources;
- Issues surrounding health management, veterinary medicines and chemicals;
- Social responsibility regarding labour practices and conflicts among users of the shared resources.

There is a need to minimise the potential negative impacts pangasius farming can have on the environment and society.

FAO reports that despite the large tonnages produced, some at extremely high density, large scale disease outbreaks seldom occur. FAO report two bacterial diseases Bacillary Necrosis of Pangasius (BNP; caused by *Edwardsiella ictaluri*) and Motile Aeromonid Septicaemia (MAS; *Aeromonas* spp). The former can be controlled by antibiotics, the latter by improved water quality and antibiotics (4).

## Management standards and certification

The development of aquaculture standards is underway through a variety of organisations, including the Global Aquaculture Alliance, GLOBALG.A.P. and WWF through the WWF Aquaculture Dialogue Standards, which will provide the basis for the Aquaculture Stewardship Council (ASC). For responsible feed production there is the IFFO Global Standard for Responsible Supply (IFFO RS).

- **GLOBALG.A.P Good Agricultural Practice** (9) is a private sector body that sets voluntary standards for the certification of production processes of agricultural (including aquaculture) products around the globe. The standard serves as a global reference system for other existing standards. It is a business to business label and not directly visible to consumers. Standards for pangasius farms were launched in April 2009 and the first certifications for pangasius achieved in April 2010.
- The **Global Aquaculture Alliance (GAA)** (10) is an international, non-profit trade association, registered in the USA, that promotes advancement in environmentally and socially responsible aquaculture. The GAA has developed Best Aquaculture Practices (BAP) certification standards for aquaculture products. GAA completed Best Aquaculture Practice (BAP) Standards for pangasius, which apply to pond culture, in August 2010. The first two-star pangasius facilities were certified in March 2011.

- The **WWF Pangasius Aquaculture Dialogue Group (PAD)** (11,12) agreed standards for pangasius in August 2010.

In December 2010 WWF, the Vietnamese government and key Vietnamese industry fisheries and aquaculture bodies reached agreement on working to achieve certified sustainable production of pangasius in Vietnam. In the interim WWF will place pangasius in a 'Moving Towards Certification' category in its seafood guides. Scottish MEP Struan Stevenson visited Vietnam in 2011 to view working practices first hand (13).

Independent consultants, representatives from feed companies, national bodies such as VASEP (Vietnam Association of Seafood Exporters and Producers), and international NGOs, such as the Sustainable Fisheries Partnership, work with farmers in order to achieve the standards set out.

In January 2011 the first global guidelines for aquaculture certification were approved by the UNFAO Committee on Fisheries. The guidelines, which are non-binding, cover animal health, food safety, the environment and socio-economic issues relating to aquaculture workers (14). The **Sustainable Fisheries Partnership** (15) operates Aquaculture Improvement Partnerships (AIPs), which are alliances of producers, suppliers and buyers working together to address sustainability issues within the fish farming sector. Currently, they are undertaking an assessment of the environmental effects of pangasius farming in the lower Mekong delta in relation to the effects of other activities, such as agriculture.

### Product characteristics and seasonal cycles

The cooked pangasius fillet is white in appearance with a slight pink or yellow colour. The colour of the flesh depends on the production and processing methods used. It has firm flesh and a mild flavour with slight shellfish overtones. Mouth feel is less fibrous than cod or haddock. If cultured correctly it should not have a muddy earthy flavour. Because of the relatively short time from harvesting to processing, freshness quality of the product should be high. For un-coated products *P. hypophthalmus* may be considered to be inferior to *P. boucourti*, producing a thinner, coarser and darker coloured fillet.

### Supply chain standards

Responsible practice in the chilled and frozen supply chain depends on correct catching, gutting, washing, chilling or freezing, processing and handling practices throughout the chain. There are standards which cover these aspects from capture to retailer:

- **British Retail Consortium (BRC) Global Standard & Safe & Local Supplier Approval (SALSA) certification.** Designed to raise standards in the seafood processing and wholesaling sectors.

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**See:** <http://tinyurl.com/seafishrsg>

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