Spare room in your barn? Fish on the farm?: Tilapia a future food fish for the UK.

Researchers at the University of Stirling have been developing small scale, warmwater production systems for growing tilapia as a diversification strategy for UK agricultural farmers and rural entrepreneurs. This three year project began in January 2005 with the aim of developing a better understanding of the challenges that face rural areas in the UK, through exploring an income earning diversification strategy producing local food using available farm infrastructure and local on-farm feeds.

Why Tilapia?
Tilapia are already noted as a highly suitable species for low cost aquaculture worldwide as they can thrive on a lower protein diet, cutting down the requirement and high cost of fish feeds (typically representing up to 80% of production costs and with a dependence upon diminishing wild stocks). Growing omnivorous tilapia therefore has the potential to be a more sustainable source of protein with fewer environmental impacts; and with its firm, white flesh and mild taste could be a suitable substitute for wild whitefish stocks such as cod and others which are frequently exposed in the media as over fished.

Being a tropical species, tilapia require a temperature of around 27^0C to grow, and under optimum conditions can reach a market size of 500g in 6-8 months, compared to 18 - 24 months for rainbow trout currently grown in the UK. Despite the prevailing British climate, appropriate use of insulation can keep energy costs low with some farmers also being able to capitalise on on-farm or local surplus heat energy currently not used. There is significant potential for UK farmers to produce tilapia by insulating underutilised farm buildings, re-using low value thermal heat and sourcing on-farm or local vegetable protein sources of feed for tilapia. More elaborate technologies might also emerge such as the use of methane produced from dairy cattle, waste heat from dairy coolers, or on-site refrigeration units.

Tilapia can be successfully grown in small scale recirculating tank systems which simply maintain water quality and fish welfare through removal of wastes into separate filtration systems whilst also being able to supplement more expensive pelleted feed with local on farm alternatives such as barley and grass meal. The outcome is minimal adverse impact on local eco-systems and communities, with the production of “local food”, traceability for consumers and therefore a reduction in food or rather ‘fish miles’ all predominating. Since “used water” is not discharged into the local environment, the nitrogen rich waste from the filtration system can be safely broadcast and re-used as a high nutrient level fertiliser for supplementing arable crop production.

Know your markets? Will this fish sell?
The main marketing focus for the first year was to determine if and where there was potential consumer demand for tilapia within the UK by visiting and carrying out interviews at a range of fish and other potential market outlets (from Brixham to Glasgow). Findings so far support the initial premise of there being a number of niche markets for fresh (not frozen) tilapia produced from local small-scale environmentally-friendly units. Three tilapia target groups in the UK were identified: ethnic consumers, green consumers and the gastro-pub set (a growing component of the wider foodservice market). Recent developments in the USA were also noted where consumption of this white fleshed fish has moved well beyond niche markets to become more mainstream throughout the country.

One route to establish communications and promote awareness of tilapia as a product is within the UK foodservice sector and the relatively small scale of production will tend to favour outlets catering for higher unit value diners rather than those who are more price-focused. The emergent trend of gastro pubs, select ethnic and other restaurants emphasising local supplies and potentially green and organic credentials would thus seem to be the more obvious initial targets. In practice individual farmers can best determine their selection of potential targets according to their location and the logistics of servicing a fresh product, combined with the day to day demands of their core agricultural operations.

As a diversification strategy……..
The project has also undertaken a study of the experiences and views of a range of agricultural farmers and their families in Central Scotland and Angus on the current status of their farming activities, and how they view or act upon potential diversification strategies in order to supplement incomes. One of the key objectives here was to improve understanding of the factors present which either encourage or dissuade farmers from embarking on diversification strategies, then assessing the success of this decision.
More recent project findings and expressed interest have developed from individuals wishing to grow tilapia in more peri-urban locations where they can benefit and develop their sales due to proximity to larger, more established markets.

Production techniques
In terms of production systems a series of technical trials have been carried out in Thailand, Stirling, and with a commercial partner on-farm in Devon. These have assessed and compared the suitability for small scale production in the UK of two types of production systems: a clearwater recirculation system with filtration compared to a static darker water bacterial floc system. Costs, income, growth rates, water quality and fish welfare under different stocking densities and feeding regimes were all analysed and compared. Results showed the recirculation system to be a far more financially viable option due to significantly higher growth rates (500g market size fish in 6-8 months), and being able to support higher stocking densities, therefore allowing higher production per unit volume tank space, whilst still maintaining excellent fish welfare indicators.

The research is now progressing further to develop novel feeding regimes to obtain optimum growth within the recirculation systems in order to reduce costs by optimising the ratio and feeding frequencies of on-farm locally available feed ingredients in relation to more expensive commercial pelleted fish feeds. In order to gain further understanding of the viability of the project the

research team is now looking to develop and test a prototype recirculation system on farm and therefore would be interested in hearing from UK farmers and rural entrepreneurs who are willing to dip their toe in this novel approach to food production.

Please feel welcome to contact William Leschen wl2@stir.ac.uk tel 01786 467899 or Francis Murray fjm3@stir.ac.uk tel 01786 467926 at the Institute of Aquaculture, University of Stirling for details. This project was funded by the Rural Economy and Land Use programme. Further information can be found on the project web page www.aquaculture.stir.ac.uk/Systems/TilapiaProject.htm

Figure 1 Insulation of Farm Building

Figure 2 Test weighing fingerlings

Figure 3 Use of waste for high nutrient fertiliser

Figure 4 6-8 months to healthy harvest size

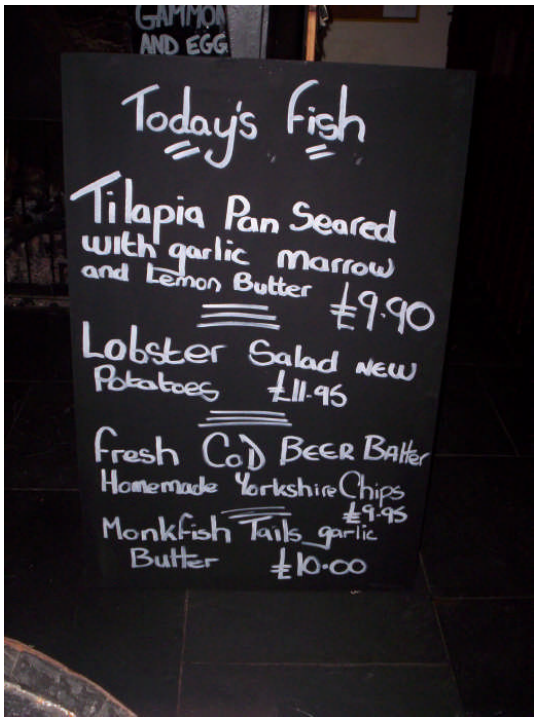

Figure 5 Tilapia featured on pub specials, Devon, UK, 2006

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