International Journal of Trend in Scientific Research and Development (IJTSRD)
Volume 4 Issue 3, April 2020 Available Online: www.ijtsrd.com e-ISSN: 2456 – 6470

Examing Quality Control Practices at the Pangasius Farm Level

Dr. Le Nguyen Doan Khoi

Associate Professor, Department of Scientific Research Affairs, Can Tho University, Vietnam

ABSTRACT

This paper examines quality control practices at the Pangasius farm level. The analysis will focus on critical control point (CCP) for fish quality in order to meet the requirements of processing export companies. For each CCP, the study considered the requirements of processing firms, the benchmark based on the APPU model, and Pangasius farming practices of fishery association and independent farmers. Gaps in quality assurance will be examined in order to point out measures necessary to improve and assure fish quality at farm level.

KEYWORDS: *quality control, farm level, CCP, Pangasius*

How to cite this paper: Dr. Le Nguyen Doan Khoi "Examing Quality Control Practices at the Pangasius Farm Level" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-4 | Issue-3, April 2020, pp.50-54, URL: www.ijtsrd.com/papers/ijtsrd30270.pdf

IJTSRD30270

1. INTRODUCTION

To meet the export demand, the processing/export companies demand quality requirements related to color, size, disease and antibiotics residues of Pangasius raw material. To achieve these they require that that fish farmers implement quality control at farm level based on better management practices (BMPs). BMPs aim to improve taking environmental and socio-economical sustainability into consideration. Implementation of BMPs is voluntary and not a requirement for certification (NACA, 2008). According to NAFIQAD (2008), BMPs are practical norms for small-scale farms to ensure fish safety and minimize diseases occurrence and environmental pollution. In other words, they have been interpreted in the MRD as management practices for small-scale farmers (NACA, 2008). Focal to BMPs is the determination of CCPs in order to prevent or reduce food safety hazards. The model of critical control point for aquaculture production (Reiily and Kaferstein, 1997) is applied. The critical control points for Pangasius pond farming are described in figure 1. The farmers should monitor and verify the control measures at CCPs to ensure fish quality and safety during culture process. There are four CCPs associated with Pangasius pond farming; these are (1) site selection, (2) water supply, (3) production, and (4) harvest.

2. Quality control practices at farm level

A quality control system to prevent or eliminate food safety hazards needs to take all CCPs into account. How to monitor each farming practice depends on the unique conditions that exist within each fish farm. This section will present four CCPs that affect to fish safety and quality and find out the gaps for each CCP.

2.1. Site selection

Selecting a suitable site is a critical activity before establishing a fish pond. At the moment, processing firms have no requirements for site selection of farms. However, farms should be located, designed and constructed in a way that minimizes negative impacts on other users and the environment (BMP, 2009). Poor pond site selection can lead to poor quality of water supply and inability to properly manage waste flows. There are two farming practices for site selection namely pond location and pond design and construction.

- **Pond location**

Processing firms have no specific requirements concerning pond location; however, ponds located in the aquaculture areas appointed by local authorities are preferred (expert interview, 2008). Practically, ponds situated near the river or big canals have more favorable conditions for fish production since they have relatively cleaner inlet water than those located far from water sources (PAD, 2008).

- **Pond design and construction**

are very dependent on the location of farms. Processing firms have set no specify requirements concerning pond design and construction. At the moment (2008), Pangasius ponds are designed rather simply without waste-water treatment pond. As a result, untreated water discharge goes directly to the common water canal or river with the risk of polluting and infecting other pond (Khoi et al., 2008).

Table1: Gap analysis for site selection

		Gaps		
Criteria	**Processing firms**	**APPU members**	**FA members**	**Independent farmers**
Pond location	**Requirements** - **Preferences** ➢ located within land use plans for Pangasius farming by local authority ➢ Good water quality available ➢ Proper planning and enforcement of the government's plan	- Yes Yes Yes	- Some Some No	- Some No No
Pond design and construction	**Requirements** - **Preferences** Waste-water treatment pond	- Yes	- Some	- No

2.2. Water supply

At the moment, processing firms have no requirements for water supply at the farm level. However, they prefer farms which apply water quality testing before supplying it to the pond.

The quantity and quality the water supplied to aquaculture operations is a key factor in production because fish is water-dependent. The source of the water supply varies depending on the farm location and the distances over which water must be pumped. Most Pangasius farms pump water from canals or river into their ponds. Effluent water may be discharged into the same water body from which water is taken. When there is limited drainage or tidal flushing of that water body, water quality is likely to be poor.

➢ **Water quality management**

Water quality conditions in the Pangasius pond deteriorate during the production cycle due to uneaten feeds, animal's excretion, etc. To ensure that the fish stay healthy and grow efficiently, the quality of the pond water needs to be monitored (PAD, 2008). At the moment, Pangasius farmers use pH level, watercolor, and water odor as indicators to judge the water quality of the pond.

➢ **Wastewater management**

Wastewater and sludge are still not managed well at the small-scale farms. For freshwater criteria, it has to stay in the waste-water treatment pond for 10 hours to be decomposed. However, the capacity of sediment pond is often small to treat water effectively to meet water quality criteria before discharging it to environment. The discharge of pond water into the channels and rivers without any waste-water treatment is causing conflict with the surrounding water users like (paddy) farmers and households. Environmental problems are a big issue in and outside the district. The rice growths too fast and therefore become vulnerable for diseases.

Table2 Gap analysis for water supply

		Gaps		
Criteria	**Processing firms**	**APPU members**	**FA members**	**Independent farmers**
Water quality management	**Requirements** - **Preferences** ➢ pH adjustment ➢ water color control and adjustment ➢ supply good quality water	- Yes Yes Yes	- Sometimes Sometimes No	- Seldom Sometimes No
Waste-waster management	**Requirements** - **Preferences** ➢ Waste-water treatment pond for water effluents ➢ Water effluents must meet criteria before being discharged to the outside environment	- Yes Yes	- Some Some	- No No

Source: Developed by the author.

2.3. Production (grow-out)

Pangasius production includes the selection of fingerlings and stocking density, the use of feeds and finances, and the use of chemical/veterinary drugs for disease treatment. Different hazards can be associated with the various production stages of aquaculture. Antibiotics and chemicals used during fingerling production may result in residues in fish which are problematic

for public health. Homemade feeds can be biologically or chemically contaminated. Approved agrochemicals and veterinary drugs need to be used to according to manufacturers' instructions. In the following these three farming practices in Pangasius production: fingerlings selection and stocking density, use of feeds and finances, and use of chemical/veterinary drugs will be discussed

- **Fingerlings selection and stocking density**

Processing firms have no requirements for fingerlings selection; however, they mentioned that health checks and treatments of fries and fingerlings from hatchery to farm need to be documented (PAD, 2008).

The quality of fingerlings directly affects the quality of fish and the need for disease treatment at farm level to prevent fish loss. At the moment, processing firms prefer to buy fish from farmers who get their fingerlings from state-ownedd hatcheries (PAD, 2008). Generally, state-owned hatcheries produce fingerlings with a better quality than private hatcheries. Moreover, they have certificates of fingerling health which make it is easier to trace back to origin of brood-stocks.

With regard to stocking density, a low stocking density is preferred in order to minimize disease outbreaks and use of drugs. The APPU members use lower stocking density (23 fingerlings/m^2) and they get higher survival rate (81%). Small-scale farmers use higher stocking density (44 fingerlings/m^2) which leads to the reduction of fish growth, low survival rate (72%) and more fish diseases.

Table3 Gap analysis for fingerlings selection and stocking density

Criteria	Processing firms	APPU members	FA members	Independent farmers
Fingerling selection	**Requirements**			
	-	-	-	-
	Preferences			
	➢ use quality fingerlings from a state-owned hatchery	Yes	Some	No
	➢ good brood-stock selection	Yes	No	No
	➢ fingerlings disease testing before releasing to the pond	Yes	No	No
Stocking density	**Requirements**			
	-	-	-	-
	Preferences			
	➢ Low stocking density	Yes	Some	Some

Source: Developed by the author.

- **Feeds and finances**

Processing firms set no requirements for use of feeds; however, they prefer farms which use industrial feeds for the entire Pangasius production cycle and keep book recording for traceability.

The APPU's members use industrial feeds supplied by Proconco Company. This feed company is certified (ISO 9001:2000) and has a production capacity of 150,000 MT aquaculture feed per year. This company produces feeds with high quality and is the top brand for seafood in Vietnam. AGIFISH signed a contract with Proconco and supplies feeds to APPU members on credit. Moreover, the company gives discounts with large volume of feeds. As cost of feed is around 70-90% of the total production cost, buying on credit is very beneficial for APPU members. APPU members use feeds according to the formula prescribed by the feed company to avoid overfeeding and to assure that most of the feed is consumed by fish (Khoi et al., 2008).

Table4 Gap analysis for feeds used

		Gaps		
Criteria	Processing firms	APPU members	FA members	Independent farmers
Feeds used	**Requirements**			
	-	-	-	-
	Preferences			
	➢ Industrial feeds for entire production cycle	Yes	Some	No
	➢ book recording of feeds used	Yes	Some	No

Source: Developed by the author.

- **Chemicals/Veterinary drugs used**

Processing firms require that only chemical/veterinary drugs are used for disease prevention which have been approved for aquaculture by relevant local authorities. Chemicals or antibiotics that are banned in importing countries are not allowed.

Processing firms prefer that disease treatment is based on laboratory diagnoses. They also urge farmers to keep a record of the name, dates, amounts, and withdrawal time of all chemicals and antibiotics used in Pangasius production.

Table5 Gap analysis for chemicals/veterinary drugs used

		Gaps		
Criteria	**Processing firms**	**APPU members**	**FA members**	**Independent farmers**
Chemical used	**Requirements** ➢ Legal chemical approved for aquaculture	Yes	Yes	Yes
	Preferences ➢ Book record of chemicals used	Yes	Some	No
Veterinary drugs used	**Requirements** Veterinary drugs approved for aquaculture	Yes	Some	Some
	Preferences ➢ Book record of the name, dates, amounts, and withdrawal times of veterinary drugs used	Yes	No	No
	➢ Diagnosis of disease at laboratory before treatment	Yes	No*	No
	➢ extension officers			

Source: Developed by the author.

2.4. Harvest

During harvest time there is strict fish quality control by processing firms. Processing/export firms have a set of requirements for the quality of fish. Moreover, they prefer to buy from farmers with documents for fish traceability. The small-scale farmers stated that the farm gate price is often decided by processing/export firms and fluctuation which based on the current market price. Therefore, it is difficult for small-scale farmers to remain profitable.

Table6 Gap analysis for harvest

		Gaps		
Criteria	**Processing firms**	**APPU members**	**FA members**	**Independent farmers**
Harvest	**Requirements** ➢ Fish quality: size, color, low antibiotic residues, disease free, live fish	Yes	Sometimes	Sometimes
	Preferences ➢ documents for fish traceability	Yes	No	No

Source: Developed by the author.

The major gap related to harvest is the lack of fulfilling the quality requirements of processing firms of small-scale farmers. Improving the cooperation between farmers and processors seems to be a key to solve problem during harvest. Currently, small-scale farmers lack bargaining power in their business relationships with processors. As a result, it is difficult for farmers to make more profit and overcome price barriers imposed by processing/export firms. Saenz-Segura (2006) found that the existence of a delivery contract has a positive effect on the quality of the product. Hence, we argue that farmers' behavior can be modified by the implementation (adding or eliminating) of certain contract clauses and improving relationships and coordination between farmers and processors. The experiences in fish farming at India (Umesh et al., 2009) demonstrated that small-scale farmers need to adopt BMPs to produce fish quality and improve prices. This could be achieved only through working in farmer groups.

3. Conclusion

The gaps analysis showed there are five main differences in quality control system between APPU members and FA members and individual farmers. These are certified fingerlings, stocking density, certified feeds, waste-water treatment pond, and certified veterinary drugs for disease treatment. Small-scale farmers have to implement quality control system at farm level to get access to the market. The experiences suggest that small-scale farmers need to cooperate in groups to share the cost of infrastructure, water quality, input quality, and market access.

References

[1] Bosc, P. M., Eychenne., Hussen, B. Losch, M.R. Mercoiret, P. Rondot, and S.M. Walker. 2002.

[2] The role of rural producer organizations in the World Bank rural development strategy. The World Bank rural development family: Rural development strategy Background Paper. Washington, World Bank.

[3] De Silva, S.S. (2009), Success Stories in Asian Aquaculture, International Development Research Centre, NACA.

[4] Di Gregorio, M., Hagedorn, K., Kirk, M., Korf, B., McCarthy, N., Meinzen-Dick, R., and Swallow, B., (2004), Property rights, collective action and poverty: The role of institutions for poverty reduction.

[5] GTZ (2005), Pangasius farming practices in Vietnam – A study in view of sustainability issues

[6] Khoi, L. N. D., (2007), Report of multi-case study of Pangasius small-scale farming practices, unpublished report

[7] Khoi, L.N.D., (2008), Primary information from 200 fish farmers and 33 experts in the Mekong River Delta, Vietnam, unpublished report

[8] Marshall, G., Patrick, I., Muktasam, A., and Ambarawati, I., (2006), Alleviating poverty by linking smallholders with agribusiness: roles of social capital and common property Pangasius Aquaculture Dialogue (PAD), WWF funded, March 2008

[9] Reilly, A., and Kaferstein F., (1999), Food safety hazards and the application of the principles of the hazard analysis and crtical control point (HACCP) system for their control in aquaculture production, Aquaculture Research, Vol.28, 735-752

[10] Tuan, N. V., (2007), Pangasius culture water management, unpublished report, College of Aquaculture, Cantho University

[11] VASEP (2006), Vietnam production of Pangasius, presentation given at the Pangasius quality and safety in An Giang province by Dr. Nguyen Huu Dung

[12] http://www.worldofpangasius.com.vn