

Responsible use of antibiotics in shrimp farming

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The recent scares in Europe about antibiotic residues in food are one of many reasons to decrease the use of antibiotics in shrimp farming. Findings of antibiotic residues in shrimps have been given much attention lately, both in importing countries and shrimp producing countries, and today many farmers are well aware of this issue.

However, one of the most important reasons to control the use of antibiotics in aquaculture is the risk of development of resistant bacteria ("stubborn bacteria"). This can occur both among bacteria infecting shrimp and bacteria infecting humans. When bacteria have acquired resistance, it is not longer possible to get rid of them with the antibiotic that caused the resistance. Furthermore, some antibiotics can cause bacteria to develop resistance not only to that specific antibiotic, but also to other, different antibiotics. Additionally, resistance-encoding elements can be transferred from one bacteria species to another. This way bacteria can indirectly become resistant to an antibiotic without being directly exposed to it.

Another important issue is that many antibiotics are occupational health hazards. Skin exposure as well as inhalation of dust from antibiotic powder may cause health problems to farmers, workers and others that are present when antibiotics are being handled.

Many of the antibiotics that are used in shrimp farming are quite persistent in the environment and can spread to surrounding waterways with the outlet water or sludge flushing or removal. In the surrounding environment they can change the ecosystems by changing the normal composition of bacteria, and also have acute toxic effects on aquatic animals and plants. They can also be taken up by organisms, for example mussels, which are collected and eaten by locals. That is, antibiotic residues in food is not only a threat to shrimp consumers in importing countries, but also a threat to people living in shrimp farming areas.

These are some important issues that should be considered by shrimp farmers

regarding the use of antibiotics:

When should antibiotics be used?

- Only use antibiotics to treat bacterial infections, not for any other reason.
- Antibiotics cannot cure viral diseases such as White Spot or Yellow Head disease. Be aware that some antibiotic products available for shrimp farmers in Thailand are wrongly marketed as cure for viral diseases.

What should be used?

- Use fresh antibiotics from a reliable source. Information about active ingredient should be available on the label.
- Make sure the antibiotic is pharmaceutical grade. Do not use chemical grade, since these products are of lower quality.
- Avoid using antibiotics that are used in humane medicine.
- Do not use chloramphenicol or nitrofurans (e.g. furazolidone, nitrofurazone, nitrofurantoin, nitroquine and nitfuratel). They are hazardous, and not allowed in animal feed in Thailand.

How should it be used?

- Keep detailed recording of all antibiotic use.
- Prophylactic use of antibiotics should be avoided as far as possible. Prophylactic use is a major reason behind resistance development.
- Avoid repeated use of the same antibiotic, in order to avoid development of resistance
- Use correct doses and durations of treatment. Do not use more or less than recommended.
- Do not use more than one antibiotic at the same time if it is not specifically recommended. Do not distribute other drugs or chemicals to the shrimp during an antibiotic treatment.
- Handle and store the antibiotic products carefully, considering the risks with

human exposure. Use tools and/or gloves to avoid skin contact if antibiotics are mixed with feed.

- The shrimps should not be treated with antibiotics within at least two weeks before harvest, preferably longer, to avoid residues.
- If the shrimps do not eat well due to an infection, it is not likely that they will consume antibiotics with feed.
- The use of antibiotics should preferably be under veterinary supervision.

In an interview study made in Thailand 2000, it was shown that 20% of all the interviewed shrimp farmers used antibiotics against viral diseases. Additionally, more than 60% of the farmers used antibiotics prophylactically. These results indicate that there is a widespread wrong use of antibiotics. But it also indicates that the usage could be decreased, according to the points made above, without negatively effecting shrimp production.

One large problem that remains to be solved is that producers and retailers of antibiotic products often neglect to provide shrimp farmers with accurate information about their products. These players must be put under pressure to provide farmers with better information regarding content and safe and efficient use of the products.

References

- Chanrathcakool, P., Turnbull, J.F., Funge-Smith, S.J., MacRae, I.H. & Limsuwan, C. 1998. Health Management in Shrimp Ponds. Bangkok: Aquatic Animal Health Research Institute.
- FAO. 1995. Code of Conduct for Responsible Fisheries. Rome: FAO.
- FAO. 1997. FAO Technical Guidelines for Responsible Fisheries. No 5. Rome:FAO.
- Holmström, K., Gräslund, S., Wahlström, A., Pongshompoo, S., Bengtsson, B.E., & Kautsky, N. (In press). Antibiotic use in shrimp farming and implications for environmental impacts and human health. *International Journal of Food Science & Technology*.
- Inglis, V. 2000. Antibacterial chemotherapy in Aquaculture: Review of practice, associated risks and need for action. In: *Use of Chemicals in Aquaculture in Asia. Proceedings of the Meeting on the Use of Chemicals in Aquaculture in Asia, 20-22 May 1996, Tigbauan, Iloilo, Philippines*. Pp. 7-22. Tigbauan, Iloilo, Philippines: Southeast Asian Fisheries Development Center Aquaculture Department.
- Somjetlerdcharoen, A. 2002. Chloramphenicol concerns in shrimp culture. *Aquaculture Asia*, 7(1):51-54