

# Chemical hazards and tractability implementation



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Research Title: Assessment of Chemical Hazards and Tractability  
Implementation in Crustacean Seafood Supply Chain

## Background

In course of time, global competition to access food business market gradually faces the consumer's new and new demand for food safety and quality. The previous safety issues were mostly concerned to the microbiological contamination especially *Salmonella* and the new complaints are associated with the presence of antibiotics such as nitrofurans which have been prohibited in different countries (Khong *et. al.*, 2004) but still in use and are readily available for veterinary and human therapy (Vasheghani *et. al.* 2008; Roychowdhury *et. al.* 2008; Petri, 2005 and Guay , 2008 ). These health hazard antibiotics and other chemicals, pesticides and heavy metals entrance to seafood from the environment (Kummerer, 2003) found that about 70% of the antibiotics streaming back into water supplies comes from livestock farming) or other sources in the production chain and attention is gradually shifting to the production process in aquaculture, including inputs used, where they come from, and the way the farms and animals are managed (Phillips *et. al.* 2004).

Tracing out the source of health hazard contaminations or any other substances intended to be incorporated into seafoods and recommending possible preventive measures complying the food safety and Traceability regulations (EU, 2014) are important challenges to supply and sustain in the competitive global seafood business.

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**Objective:**

The major objectives of this research work will be find out the probable sources of chemical contaminants affecting seafood safety in order to ensure preventive measures and comply with the international food safety regulations. Specific attention will be given to achieve the followings:

1. Collection of information on the use of harmful antibiotics and other chemicals in their parent forms and metabolite forms in shrimp feeds and shrimp from hatchery to grow out ponds.
2. Investigation of the source and the possible routes or pathways through which the harmful antibiotics and other chemicals gain access into the shrimp body in their parent forms and metabolites forms.
3. Investigation of the source of some other selected organochlorine pesticides and heavy metals in shrimp/fish feeds and their body.
4. Assessment of the residual effects and withdrawal periods of antibiotics to be found in the shrimp body.
5. Development of the effective traceability system in the shrimp value chain as per Traceability Regulation.

**Methodology:**

1. Investigation on the source of harmful antibiotics especially nitro-furans, other antibiotics and chemicals

- Sampling site in shrimp producing areas will be selected.
- Data collection format and questionnaires for interviewing target group of different stakeholders associated with the process will be prepared.

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- The major targets for sample collection will be shrimp processing factory, waste water, culture pond water, shrimp from different sources, ice factory, ice, hatchery, shrimp larvae and post larvae, nursery, feed, feed ingredients etc.

## 2. Trial on residual analysis of shrimp larvae and post larvae in grow out pond

- Several trails will be done on residual analysis of the shrimp fry treated with antibiotics reared in a restricted pond.
- Some selected antibiotics will be used through feeds. The samples will be analyzed with time interval for different antibiotics.

## 3. Laboratory Analysis:

- Sample of shrimp/shrimp fry, fish feed, water, fish feed, feed ingredients, ice, hatchery inputs and will be analyzed.
- Antibiotics such as nitrofurans, nitrofurans metabolites (AMOZ, AOZ, SEM, AHD), chloramphenicol, nitromidazoles, tetracycline, Oxytetracycline, Safrad, different types of hormones, Malachite green & leuco malachite green, crystal violet, insecticides (aldrin, DDT, dieldrin, heptachlor, PCB, s etc), heavy metals (pb, Hg, Cd, Cr, As), , mycotoxin (aflatoxins, DON, charatoxin A, Zearalenons) will be analyzed.

## Main Activities:

Activity 1: Selection of the sampling sites and conducting survey on the present quality management system of shrimp and types of chemicals used in the hatchery and culture system.

Activity 2: Collection of different types of samples such as soil/sediments, water, shrimp fry /shrimp, feed, feed ingredients, ice, hatchery inputs etc.

Activity 3: Laboratory analysis of the collected samples for antibiotics, growth promoters, pesticides and heavy metals etc.

Activity 4: Conduction of several trails for the investigation of residual effects of different chemicals on human health and determination of the withdrawal periods of different chemicals.

Activity 5: Development of training plan and conduction of training program on traceability and quality assurance for different stakeholders in shrimp value chains.

Activity 6: Analysis of the laboratory reports and information collected through questioners, interpretation of the data collected, preparation of Draft Report and submission

Activity 7: Quarterly and annual reports will be prepared for review workshop during on-going research work and final workshop to present findings.

Expected Results:

- The source of harmful antibiotics especially Nitrofurans, other antibiotics and chemicals in their parent forms and metabolites forms to be found in shrimp body and feed will be identified.
- Organochlorine pesticides and heavy metals in feeds and shrimp/fish products will be identified;

- Preventive measures will be taken and awareness building among the stakeholders in the shrimp value chain will be made against the use of harmful antibiotics;
- Effective traceability system will be developed in the shrimp value chain.
- Quality control and safety of seafood products will be maintained.
- Confidence of the consumers on seafood will be increased.

## References:

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