

JIFSAN Good Aquacultural Practices Program

Introduction



By Brett Koonse



INTRODUCTION

Over the last thirty years, consumption of seafood products has doubled and is anticipated to continue to grow 1.5 percent per year through 2020. Currently, one in five people depend on seafood as their primary source of protein. This is a positive public health development because the scientific evidence is clear: eating more fish and shellfish will lead to a healthier, smarter, and longer-lived population.

Unfortunately, over 70% of the world's fish species are either fully exploited or depleted with another 21% considered to be moderately exploited, according to the United Nations Food and Agriculture Organization (FAO) estimates. In the future, aquaculture, the science and art of growing seafood such as catfish, salmon, oysters, or shrimp under controlled conditions in ponds on land or in pens or nets in the ocean, will need to fill the gap between sustainable wild supplies and the public demand for seafood. In fact, global aquaculture production will need to nearly double by the year 2050 to meet this consumer demand for seafood.

The aquaculture industry has responded to this demand by becoming the fastest growing sector of the world food economy by increasing production by more than 10 percent a year. It currently accounts for half of all food fish production worldwide. A wide range of seafood species are now being successfully grown in a variety of locations, providing high quality, nutritious, and consistently uniform seafood to processors, retailers, and consumers all over the world.

In order for aquaculture to advance further as a food producing industry, food safety needs to become an integral part of the farm-to-table food safety continuum.

Food Safety and Aquaculture

Many of the real and perceived concerns with aquaculture and aquaculture products are about food safety. The two main food safety concerns with aquacultured products are residues of

- chemicals or unapproved drugs and contamination
- from pathogens, such as *Salmonella*. The origins of these hazards are different from those associated with seafood caught in the open ocean because they usually originate at the farm site and may remain in or on the product through the normal steps of washing, sorting, and packing done at the primary processing step.

Background

The objective of this manual is to provide uniform, broad-based scientific and practical information on the safe production, handling, storage, and transport of aquacultured products. This manual will:

1. Provide a teaching tool to trainers who will be conducting courses to facilitate the safe production, handling, storage, and transport of aquacultured products in countries exporting to the United States and elsewhere.
2. Serve as a resource for trainers preparing and conducting courses to assist those in the aquaculture industry with identifying and implementing appropriate measures to minimize risks of microbial and residue contamination.
3. Provide information to the aquaculture industry about the complex relationship between food safety and the import requirements of receiving countries.

The information and recommendations presented expand on the material developed for the Regional course in Vietnam in November, 2006. The material in this manual is meant for guidance, not regulation and should be applied as appropriate and feasible to individual aquaculture operations.

Use of This Manual

Information presented includes:

- **Principles**—science-based information regarding elements of aquaculture product safety. Topics included are:

- The importance of training for improving the safety and quality of aquacultured products.
- The food safety hazards attributed to aquaculture products.
- Good aquaculture practices (GAQPs) at each step in aquaculture (hatcheries, grow-out, harvest, transport, primary processing).
- Describing and presenting the importance of minimizing the environmental impacts for food safety.
- Developing an effective training course.
- Evaluating the implementation of a GAQP program.

Practical—materials to accompany and complement lectures. Included are experiments/demonstrations, discussion questions, problem solving activities and a Field Site Visit Guide.

Additional Resources—includes relevant reference documents and information on obtaining additional resource material.

As training needs vary by country, the time frame for training and the extent of training will also vary. It is anticipated that the length of time to present the Principles and Practical information will be 5 days with the inclusion of a field site visit. The backgrounds and needs of the course participants will determine how much time should be spent on each of the training modules. Logistics, budget, and schedules may dictate shorter or split sessions and the number of Practical activities that are included. Since interactive sessions with discussions, lab demonstrations, field visits, and case studies are an important part of the training process, the number of participants needs to be limited to a manageable level for trainers and facilities.

Included throughout the Principles section are suggestions for information that may be highlighted as visuals. These are intended as suggestions for visuals, not as actual visual masters. Depending on the amount of material to be presented, the type of visual aids to be used, and the size of the training group, the trainer may choose to present each as a single visual or as multiple slides, overheads, charts, or posters.

The Practical section of the manual includes activities to involve participants in the training. Use of these activities will enhance training of

trainers by complementing lecture material and by providing the participants with ideas for activities to enrich their own training efforts. Suggestions for activities related to training topics are included at the beginning of each of the training modules. Trainers of trainers are encouraged to use as many of these as time and resources will allow.

Users of this manual are reminded of several important considerations in applying its recommendations:

- 1) The manual focuses on microbial, chemical, and drug residues for aquaculture products. It addresses these hazards in fairly broad terms. When providing recommendations to growers, packers, and shippers it is important to encourage them to apply the techniques that are most appropriate for reducing hazards in their individual operations. They should also strive to establish practices that do not inadvertently increase other risks to the food supply or the environment (e.g., excessive packaging or improper use and disposal of antimicrobial chemicals).
- 2) This training manual focuses on risk reduction, not risk elimination. Current technologies cannot eliminate all potential food safety hazards associated with aquaculture products.
- 3) This training manual provides general, scientifically based principles. Trainers should encourage operators to use the information to help assess microbiological and unsafe residue hazards within the context of the specific conditions (species, geographical grow-out location, cultural and economic conditions) that apply to their own operation and implement appropriate and cost effective risk reduction strategies.
- 4) Users of the manual should constantly be alert for new information and technological advances that expand the understanding of those factors associated with identifying and reducing the food safety hazards associated with aquaculture products. Awareness of these advances will allow updating the recommendations and information contained in this manual as appropriate to keep training content current.