The Four P's of a Safe and Sustainable Aquaculture Industry:

Practices, Presentation, Promotion and the Press

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Agenda

The Four P's of a Safe and Sustainable Aquaculture Industry: Practices, Presentation, Promotion and the Press

Introduction

Public perceptions of U.S. aquaculture may have been influenced by misguided media and the spreading of misinformation by opponents of animal agriculture. These perceptions limit market opportunities and affect critical changes in state and federal regulations. It's time to take a proactive stance and respond effectively.

Practices

Ensuring that aquaculture products are safe: Practices that keep undesirable plants, fish, mollusks, parasites, and viruses off farms and out of products.

Ensuring that aquaculture products are sustainable: Practices on farms in this region that minimize the effects of aquaculture on the environment.

Promotion

Answering the hard questions: Promoting US aquaculture by providing the real answers to difficult questions about safety, sustainability, and farm practices.

Presentation

Demonstrating that aquaculture products are safe and sustainable: Enhance the status of farms by showing that compliance with current regulations is proof that farms exceed the standards set by stringent third party certification programs.

Visitors to fish farms: What visitors see can be more influential than what is said.

Press

Sharing the good news: Working with the press, prospective buyers, environmental organizations, and local decision makers to help them understand the important role that US aquaculture plays in ensuring the sustainability of our aquatic resources, protecting the environment, meeting America's need for a high quality food supply, and helping grow the economy.

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Ensuring That Aquaculture Products Are Safe

Aquaculture's detractors argue that farmed plants and animals are a source of diseases and aquatic nuisance species (ANS) that threaten natural ecosystems and human health. To successfully counter these claims you must be able to explain the measures that you take to ensure that your product is safe. The first step is to decide which disease and ANS organisms are of concern for your operation. This decision is based on the following criteria.

- Potential to harm humans
    - Are there human food safety issues?
- Potential to harm the environment
    - What could happen if this organism escaped from my farm?
- Potential to harm the crop
    - Kills crop, reduces market value, competes with crop
    - Interferes with water movements or harvest
- Potential to trigger regulatory responses
    - OIE listed diseases, NAAHP listed diseases, regulated by states
- Potential to impact customer or public perception
    - Will I make the newspaper?
    - Would this cost me customers?
- Potential for introduction onto your facility
    - Is it present in my area?
    - Is it present in my fish and water sources?
    - Is it an organism that moves easily to new places?

Once the list of target diseases and ANS is in place, organize your operations so that you can make the following claims. "I know that my products are free of these ANS and important diseases because..."

1) I have them inspected for diseases
    a) lot or farm-level inspections are done
    b) enough animals are inspected to make sure that the disease would be detected.
    c) the testing is done in a reputable lab
    d) there is 3rd party oversight of the sampling and submission

2) I only bring safe stock onto my farm
    a) captive broodstock and on-farm production
    b) stock from an inspected and biosecure source
    c) stock inspected before they are brought onto the farm
    d) stock that has been quarantined and tested on my facility
    e) stock hatched on my facility from disinfected eggs

3) I only use safe water
    a) well water
    b) fish free spring
    c) disinfected water
    d) water from a source proven to be free of ANS and important diseases
    e) drains are designed to prevent invasion from downstream

4) I disinfect people and equipment entering my farm
   a) trucks and nets are cleaned and disinfected in a safe area
   b) safe and effective disinfectants are used
   c) employees returning from off-farm aquatic sites clean and disinfect clothes and skin

5) I control animals and human visitors
   a) barriers are in place to block the entry of ANS
   b) barriers are in place to block animal vectors of disease
   c) risky visitors are kept away from critical areas

6) I prevent transmission of diseases & ANS
   a) the facility is subdivided into several biosecure areas
   b) equipment and employees are disinfected when moving between areas
   c) eggs are disinfected prior to hatch
   d) ponds are disinfected between crops

7) I have a good biosecurity plan
   a) considers all target organisms
   b) looks at all routes of entry
   c) targets all priority pathways
   d) is practical and clearly written
   e) employees are trained to insure compliance

8) My biosecurity is overseen by a third party
   a) an independent fish health professional verifies our biosecurity
   b) our veterinarian verifies our farm biosecurity
   c) a state or federal agency verifies our farm biosecurity
   d) a third party certifier verifies our farm biosecurity

9) I am subject to strict state and federal regulations
   a) intrastate regulations
   b) state regulations on importation
   c) federal regulations on interstate movement
   d) federal regulations on interstate movement

10) Self preservation motivates me to be careful
   a) ANS might harm our crop
   b) ANS might disrupt farm operations
   c) diseases would kill my animals too
   d) the regulatory impacts of a disease or ANS introduction might bankrupt me

Farms that can make the points above can mount very effective arguments to counter assertions that ANS and diseases from aquaculture pose a threat to humans and the environment. Get your case together and make the good news known!

A Quick Guide to Designing an Aquaculture Biosecurity Plan

The outline below provides an outline for the steps that must be taken to develop and effective and credible aquaculture biosecurity plan. For more detailed information targeted to specific crops and production systems, contact your local aquaculture Extension Specialist or Regional Aquaculture Center.

1) Identify target diseases and ANS by the following criteria
    a. Potential to harm the crop
    b. Potential to harm the environment
    c. Potential to harm humans
    d. Potential to trigger regulatory responses
    e. Potential to impact customer or public perception
    f. Potential for introduction

2) Identify possible routes of entry for targeted diseases and ANS
    a. New stock- Broodstock, brokered plants and animals
    b. Water source
    c. People and Equipment
    d. Wild animals

3) Prioritize responses
    a. Rank the routes as most risky to least risky
        i. Stock (ranked below as least to most risky)
            1. Farmed with a plan like yours
            2. Farmed and lot inspected
            3. Wild from presumed negative area
            4. Wild from positive area
        ii. Water source (ranked least to most risky)
            1. Well, protected spring
            2. Surface water where target organisms not thought present
            3. Surface water where target organisms may be present
        iii. People and equipment (ranked least to most risky)
            1. Cleaned and disinfected before entry
            2. From farms with plans like yours
            3. Coming to farm from other fish farms
            4. Contact with wild fish and water
        iv. Wild animals (ranked least to most risky)
            1. That might carry diseases or ANS on shells, feathers, or fur
            2. That can be infected by target diseases or ANS
            3. That are diseases or ANS and move themselves
    b. Look at methods to reduce the risk
        i. Stock – can you use captive stock, are there safer sources?
        ii. Water – can you use a safer supply, is disinfection practical?
        iii. People and equipment – can you clean and disinfect?
        iv. Wild animals- barriers (waterfalls, fences, screens) and harassment
    c. Consider the methods required to block those routes
        i. Are they effective?
        ii. Are they practical?
        iii. How much will they cost?

4) Develop a plan
    a. Begin with important routes for the most important diseases and ANS
    b. Select methods that are effective and practical
    c. Look for big-picture solution effective against many disease and ANS threats
    d. Address the less important routes as long as it makes sense to do so

5) Implement the plan
    a. Write it up
    b. Train your employees
    c. Look for ways to motivate them to comply with the plan

6) Monitor the effectiveness of the plan
    a. Look for ways to detect non-compliance
        i. Color codes, dedicated equipment, records
    b. Look for ways to document compliance
        i. In house verification
        ii. Third party verification
    c. Take measures to detect diseases or ANS that penetrate your defenses
        i. Disease testing, ANS inspections

7) Be prepared to respond to disease and ANS invasions
    a. Is the disease or ANS regulated by any legal jurisdiction where you do business?
    b. If so, who do you report to and how are they likely to respond?
    c. What are your obligations toward your customers?
    d. What steps will be needed to eradicate the pest if it is introduced?

Demonstrating That Aquaculture Products Are Safe and Sustainable

In the National Aquaculture Act (1980), Congress declared: "It is, therefore, in the national interest, and it is national policy, to encourage development of aquaculture in the United States." This strong statement of support is because U.S. aquaculture has a substantial economic impact, especially in rural communities, and because most (>90%) of U.S. aquaculture farms are small businesses.

Aquaculture as a whole has been strongly criticized by some major environmental organizations, primarily for food safety, environmental sustainability, and social issues. The criticisms have been directed mostly at international shrimp farming and salmon net pen culture, but have affected all of aquaculture. U.S. aquaculture producers are faced with the need to demonstrate that their products are safe and are raised using responsible management practices. Yet U.S. products are among the safest in the world, and produced under environmentally sustainable conditions by educated farmers practicing environmental stewardship on family farms, overseen by a host of federal and state governmental agencies that regulate aquaculture businesses.

One pathway to demonstrate that U.S. aquaculture is "green" is to seek certification of products and production practices. Certification is defined by the Food and Agriculture Organization of the United Nations (FAO) as a "Procedure by which an official certification body or officially recognized certification body gives written or equivalent assurance that a product, process or service conforms to specified requirements." Examples include the "Good Housekeeping Seal" and "Underwriters Laboratories" (UL). Government agencies already operate some certification programs. In Florida, aquaculture producers must meet specific requirements to be certified by the Florida Department of Agriculture. The State of Arkansas certifies bait and ornamental fish farms that meet strict fish health, aquatic invasive species, and biosecurity standards.

A large number of aquaculture certification programs now exist to support various claims regarding seafood products and how they are produced. These are primarily private, third-party certification systems, although select products may be certified by government programs (e.g., Label Rouge). Certification programs are sought by retailers for products imported from developing countries, where government food safety and environmental standards are non-existent, weak, or not adequately enforced. Typically, certification programs adjust standards to meet local production systems, and at best seek to provide equivalent outcomes rather than equivalent processes. However, certification by private firms cannot and does not provide for regulatory enforcement, and cannot inflict civil or criminal penalties to ensure product safety or sustainability.

Typical categories for standards of certification programs (based on FAO guidelines) are food safety and quality, environmental integrity, social responsibility, and animal health and welfare. Within the U.S., these standards are set and enforced by mandatory regulations, by both federal and state governments.

Food Safety: In the U.S. the Food and Drug Administration (FDA) operates a mandatory safety program for all fish and fishery products under the provisions of the Federal Food, Drug and Cosmetic (FD&C) Act, the Public Health Service Act, and related regulations. State Departments of Health also inspect fish processing establishments, including the condition of product, the equipment, the manufacturing process, hygienic practices, sanitation, and labeling

of products. The FDA Center for Veterinary Medicine (CVM) regulates the manufacture and distribution of food additives and drugs that will be given to animals, including fish, and regulates animal feed products.

Environment: The U.S. Environmental Protection Agency (EPA), under the Clean Water Act, establishes effluent guidelines, national standards for wastewater discharges to surface waters, including discharges from concentrated aquatic animal production (CAAP), or aquaculture, facilities. Each state's Department of Environmental Quality regulatory program sets pollution limits, determines compliance, and enforces environmental laws and regulations. The EPA works with its federal, state, and tribal regulatory partners to assure compliance with pesticide laws and regulations in order to protect human health and the environment. The Fish and Wildlife Service (FWS) is authorized to regulate the importation and transport of species, including offspring and eggs, determined to be injurious to the health and welfare of humans, the interests of agriculture, horticulture or forestry, and the welfare and survival of wildlife resources of the U.S. The FWS also enforces the Endangered Species Act (together with the National Oceanic and Atmospheric Administration), and provides migratory bird protection. State Natural Resource Agencies protect wildlife and natural resources.

Social Responsibility U.S. Department of Labor and state partners enforce the Occupation Safety and Health Act, the Fair Labor Standards Act, and the Worker Protection Standard. The U.S. Equal Employment Opportunity Commission enforces federal laws that make it illegal to discriminate against a job applicant or an employee because of the person's race, color, religion, sex, national origin, age, disability, or genetic information. State Departments of Labor administer and enforce laws relating to minimum wage, overtime, student learners, child labor, disabled workers and equal pay, and collecting unpaid wages for employees.

Animal Health and Welfare: The USDA Animal Plant Health Inspection Service (APHIS) provides leadership for determining standards of humane care and treatment of animals. APHIS provides agricultural producers with a broad range of cooperative programs for protecting the health of animals and plants. Veterinary Services within APHIS "protects and improves the health, quality, and marketability of our nation's animals, animal products, and veterinary biologics by preventing, controlling, and/or eliminating animal diseases, and monitoring and promoting animal health and productivity."

Summary: U.S. aquaculture producers and products are subjected to a multitude of federal and state regulations that ensure product safety, environmental sustainability, social responsibility, and animal health and welfare. Major certification plans duplicate U.S. government regulations, but the certifiers lack regulatory authority to enforce standards. Producers incur added costs to become certified, but do not receive a price premium for their products.

Aquaculture Certification
Frequently Asked Questions

Q. Is your food fish farm certified? If not, why not?

A. No, and I'll tell you why. ***The major certification programs cannot guarantee that the imported seafood that you eat is really safe.*** If I sell my U.S.-raised product under the same certification program, with the same seal, I'll be helping importers sell potentially adulterated products and making them look equally safe as our U.S. products, and that's simply not the case.

Aquaculture certification programs developed in response to consumer concerns about the safety of imported seafood produced in developing countries. Less than 2% of imported seafood is inspected, and residues of antibiotics and chemicals illegal in the U.S. have been found in imported products. Unfortunately, third-party certification programs cannot guarantee product quality or sustainable production methods, and are based primarily on inspection of farm records. Such programs also lack the authority to impose penalties, other than warnings or loss of certification. In contrast, ***my farm and my products meet or exceed all the standards set by the federal and state government, and there are severe penalties for anyone violating these regulations***. In essence, my farm is certified by the U.S. government.

Q. Will certification prevent aquaculture producers in developing countries from using human antibiotics and other chemicals banned in the U.S.?

A. Certification standards typically do attempt to limit the use of some especially dangerous antibiotics and chemicals, but certifiers must rely primarily upon farm records and interviews to determine antibiotic use, and many antibiotics are readily available without prescriptions in developing countries. ***In practice, producers in developing countries can and do use a wide variety of antibiotics that are not legal in the U.S.,*** either because of human safety concerns, or concerns that use of the limited number of available human antibiotics for aquaculture products will encourage the rapid development of resistance, and render the antibiotic useless for treating humans.

Q. What about environmental standards? Doesn't certification ensure that products are raised using sustainable methods?

A. Unfortunately, ***a certification logo does not guarantee that imported products are raised under the same strict environmental regulations as U.S. products.*** The major certification programs have flexible standards depending on the country and production system. While third-party certification programs are useful in encouraging more sustainable production practices in developing countries, they are limited by practical considerations to seeking improvements in current production and processing practices rather than ensuring that farms and processors meet U.S. standards.

Q. Do producers obtain premium prices for certified aquaculture products?

A. Currently, in most cases ***aquaculture producers do not obtain higher prices for certified products, yet the costs of farm certification are borne by the producer.*** Processors also have to pay to be certified. If organic standards are developed for seafood, it is possible that producers could obtain higher prices for organic products, but of course, production costs would be higher, primarily due to the higher cost and limited availability of organic feeds.

Q. Are consumers willing to pay more for certified aquaculture products?

A. *Studies have shown that U.S. consumers are not willing to pay more for certified aquaculture products*. Certification is being pushed by retailers, importers and environmental organizations, and some retailers require specific third-party certification (or will soon) for aquaculture products that they purchase. Unfortunately, this will force U.S. producers, who already produce safe and sustainable products without the need for certification, to pay for certification just to be able to sell their product to these retailers.

Q. Who benefits from certification programs?

A. *Importers and retailers are the major beneficiaries of third-party certification schemes, not farmers, but farmers (and processors) have to pay the costs.* In the United Kingdom, for example, purchasing certified seafood products helps retailers reduce liability for any seafood safety problems. Importers are using certification to allay consumer concerns over the safety of cheaper imported seafood from developing countries, rather than paying more for U.S. products that are raised under strict laws and regulations. While definitive studies are lacking, it appears that certification programs could result in some environmental, social and food safety improvements in developing countries, if strict adherence to certification standards can be obtained. However, certification is also likely to cause hardship for small-scale producers in these countries, as small producers are unlikely to be able to meet certification standards and costs.

A Comparison of Typical Third-Party Certification Standards To U.S. Federal and State Regulations

Issue/Concern/Standard	Federal and State Regulatory Authority
LEGAL AND LABOR STANDARDS	
Property rights and regulatory compliance. • Is your farm legal? • Do you comply with applicable laws?	Farms must comply with federal, state, and local laws. Government agencies require that farms obtain aquaculture permits, business licenses, construction permits, etc. If a NPDES permit is required, it must be obtained from the State Department of Environmental Quality (DEQ).
Community relations • Is your farm a good neighbor?	No specific legal requirement. However, fish farmers are part of their local communities. Over 90% are small businesses; most are family farms.
Worker safety and employee relations • Does your farm comply with labor and immigration laws?	Occupational Safety and Health Administration (OSHA) and State Departments of Labor enforce safety and labor laws. The U.S. Immigration and Customs Enforcement (ICE) Agency enforces immigration laws and guest workers.
FOOD SAFETY	
Food safety: drug and chemical management • If your farm uses any medicines, are these legal drugs only? • If you use feed, is it safe? • If you use chemicals or pesticides on your farm, are they legal and safe?	The FDA Center for Veterinary Medicine (CVM) regulates the manufacture and distribution of food additives and drugs that will be given to animals, including fish. The FDA CVM also regulates animal feed products, to ensure safe feeds. The EPA and State Departments of Agriculture regulate pesticides and the application of pesticides to the farm environment.

Food safety: microbial sanitation • Is your farm sanitary? • Are your products processed under sanitary conditions?	The FDA operates a mandatory safety program for all fish and fishery products under the provisions of the Federal Food, Drug and Cosmetic (FD&C) Act, the Public Health Service Act, and related regulations. State Departments of Health also inspect fish processing establishments, including the condition of product, the equipment, the manufacturing process, hygienic practices, sanitation, and labeling of product. Processors participate in a voluntary fee-based NOAA program to ensure that their plants meet mandatory FDA HACCP requirements.
ENVIRONMENTAL SUSTAINABILITY	
Effluent management • Do water discharges from your farm damage the environment?	EPA and state DEQ enforce the Clean Water Act, and regulate aquaculture as a CAAP, "concentrated aquatic animal production." Revisited and revised regulations in 2000-2004. Depending on size and production system, farms may be required to have a NPDES permit and BMPs. Individual states may impose more stringent regulations, but not less rigorous ones. Effluent limitation guidelines and supporting documents are available at: http://www.epa.gov/guide/aquaculture/
Wetlands conservation • Does your farm destroy wetlands?	The Natural Resources Conservation Service (NRCS) and U.S. Army Corps of Engineers enforce wetland regulations and permitting.
Biodiversity protection • Does your farm reduce biodiversity?	The U.S. Fish and Wildlife Service (FWS), U.S. Environmental Protection Agency (EPA), State Natural Heritage Commission (or equivalent agency) protect biodiversity.

Migratory birds and predators • Does your farm obey wildlife laws?	FWS and State DNR enforce migratory bird regulations. Animal Plant Health Inspection Service (APHIS) Wildlife Services provides assistance in mitigating bird problems, especially with non-lethal 'scare' programs.
Endangered species • Does your farm avoid affecting endangered species?	The FWS and National Oceanic and Atmospheric Administration (NOAA) enforce endangered species laws.
Fish meal and fish oil conservation • Do you feed carefully? • Do you know the protein and fat content in your feed, and the sources? • Do you purchase feeds that minimize use of fishmeal and fish oil?	Feeding practices are not regulated by the government, but farmers have strong incentives to feed carefully to minimize water quality problems and reduce costs. State Departments of Agriculture regulate animal feed labeling and monitor compliance through analyses. Free market – aquaculture feed mills seek to minimize use of relatively expensive fishmeal and oil, and use available substitutes, e.g., poultry meal.
Soil and water conservation • Does your farm use excessive groundwater? • Does your farm properly dispose of sediment?	States DEQ set effluent limitation guidelines, including turbidity and salinity. States Soil and Water Conservation Commission or equivalents regulate groundwater use; water rights and authorities vary among states.
Control of escapes and exotic species • If you raise non-native species or genetically distinct strains, are they legal? • Do you take measures to prevent escapes?	State DNR regulations require that only approved aquaculture species may be raised and stocking fish into the wild is not permitted. The FWS controls the importation and interstate transport of non-native animals and plants. Farms have a strong incentive to avoid escapes, as fish that escape are a financial loss
Use of genetically modified organisms? (GMO)	There are no GMO fish in commercial production. GMO products would require approval from APHIS, EPA, and also, for food or animal feed purposes, U.S. Food and Drug Administration (FDA) approval. Individual states can also regulate GMO organisms, even ornamental fish.

Storage and disposal of farm supplies • Does your farm properly store and dispose of chemicals and wastes?	State Departments of Agriculture regulate agricultural chemicals and their storage. Fuel / oil and solid waste disposal are typically regulated by DEQ.
FISH HEALTH AND WELFARE	
Fish health and welfare • Does your farm take good care of the aquaculture species being raised?	It is in the best interests of producers to operate farms to maintain healthy fish. Animal welfare is regulated by APHIS and state agriculture departments. Veterinary Services within APHIS "protects and improves the health, quality, and marketability of our nation's animals, animal products, and veterinary biologics by preventing, controlling, and/or eliminating animal diseases, and monitoring and promoting animal health and productivity."
Harvest and transport • Are your aquaculture species humanely transported? • Are your aquaculture products humanely slaughtered?	Good practices are in best interest of producer to avoid losses & dockages. Products are transported and held live, then humanely stunned before processing.
RECORDS AND COMPLIANCE	
Traceability Record-keeping requirement • Can your farm products be traced back to your farm? • Do you keep records of your farm operations (what is in each culture unit, feeding, etc.)?	Processors keep records of purchases and can trace lots of processed fish back to farm. Farms are not required to keep records on a "per pond" basis, but good farm records are important to farmers for farm financial planning and USDA Farm Service Agency programs. State Departments of Natural Resources require record keeping of fish sales and fish transport (also fish health). APHIS regulates interstate fish transport through fish health regulations. State Departments of Agriculture require training and record keeping for use of restricted use pesticides.

Enforcement • Are there penalties for not complying with regulations?	Regulatory agencies have the right to access farms and farm records. Violation of regulations can result in civil or criminal penalties, loss of license, and exposure to lawsuits. In certain instances, failure to comply with a state DNR regulation can result in prosecution under the federal Lacey Act, with severe criminal penalties.
Compliance requirements • Does your farm have to comply with all rules and regulations?	To be in compliance, farms must comply with all laws and regulations. Individual agencies may provide grace periods for regulatory compliance, or not.
Fees • Do you have to pay an extra fee for certification?	Permit fees vary by agency and state and must be renewed on a regular basis, typically, annually. Any third-party certification program costs would be in addition to governmental fees.

SUMMARY

Standards for typical certification programs are similar to the regulations and laws that U.S. aquaculture producers must obey. However, record-keeping requirements are often more extensive and burdensome, as certifying bodies must rely heavily on self-reporting and records in order to determine compliance. Certification programs have no regulatory authority and cannot impose greater sanctions than loss of certification. In contrast, government regulators can enforce civil and criminal penalties. In general, at the present time, aquaculture producers must pay to be certified and do not receive more for certified products, and surveys indicate that U.S. consumers are unwilling to pay more for certified products.

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Farm Visits

Farm visits can provide a wonderful opportunity to educate people (and the press) on farming, with care to avoid unintended outcomes. What visitors see can be more influential than what is said. The outline below describes the practical steps for producers hosting farm visits.

Have a Visitor Policy:

- Decide in advance on a uniform policy for visitors; communicate to employees.
- Uninvited visitors: how will you deal with them?
- Official visitors – some 'visitors' have a legal right to inspect your farm and records. Request I.D. and record; you can have legal representative present.
- If you do welcome visitors:
    - Check with insurer on potential liability and coverage.
    - Maintain a visitor's log – have people sign in.
    - Post signs and designate a visitor parking area.
    - What about children?
    - Provide protective/biosecurity gear if needed.
    - Control access.
    - Have brochures/freebies. Everyone loves something free.
    - Have water and restroom available.

General farm appearance:

- Clean and organized.
- Ask a non-farmer for a pre-visitor review.

Employees trained?

Biosecurity:

- If you say it, show it and mean it. Signs, painted lines, foot baths, etc.

Animal welfare:

- Anthropomorphism – people project their own feelings onto animals, including fish.
- No dead or dying fish, or tadpoles, please.

Chemicals:

- Approved and secure storage – locked.
- Approved chemicals.
- Approved brands of approved chemicals.

Environmental sustainability:

- If you say it, show it and mean it. Know what is in your effluent, where it is discharged, and possible effects on the receiving waters.

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Focus Points

United States farm-raised seafood is sustainable. Fish and shellfish can be farmed using methods that do not harm the environment and help meet the growing demand for seafood by supplementing wild harvest.

Producers work with the U.S. Environmental Protection Agency (EPA), the U.S. Food and Drug Administration (FDA), the U.S. National Marine Fisheries Service (NMFS), the U.S. Department of Agriculture (USDA), the U.S. Fish and Wildlife Service (USFWS), and numerous state environmental agencies to ensure that they protect the water and fish for future generations.

The United States aquaculture industry works closely with government, the research community, and academia to help ensure that the best possible methods are used for production.

United States aquaculture is critical to this nation's food security. Currently over 85% of all the seafood consumed in the United States is imported.

For most Americans, the benefits of increased seafood consumption far outweigh any potential risks.

As with any food, no matter how healthful, excessive consumption of one particular product should be avoided. The key to good nutrition is to eat a variety of different foods. With all the seafood choices available, it is easy to enjoy versatile meals.

Very few drugs have been approved for use with aquatic animals. When a drug is used, strict withdrawal times must be maintained so that no drug residues remain when the fish reaches the marketplace.

Fish and shellfish farm-raised in the United States must meet rigorous standards for both product wholesomeness and environmental impact. Seafood processors and packers comply with the requirements of the mandatory Hazard Analysis Critical Control (HACCP) Program administered by FDA

More than 6,400 American aquaculture farms contribute to the growth of the domestic aquaculture community, according to the U.S. Department of Agriculture Census of Aquaculture.

In addition to direct job creation, aquaculture producers create jobs in other industries such as seafood processing, marketing, transportation, and equipment manufacture. It is estimated that for every fish farm job, four additional jobs are generated in the economy at large. This job creation is especially important in economically challenged areas because the majority of the income stays within the community and supports local businesses, institutions, and families. Dollars earned in the community tend to be spent at the corner gas station, neighborhood restaurant, and other local businesses. Tax dollars generated support local schools, hospitals, and other community services.

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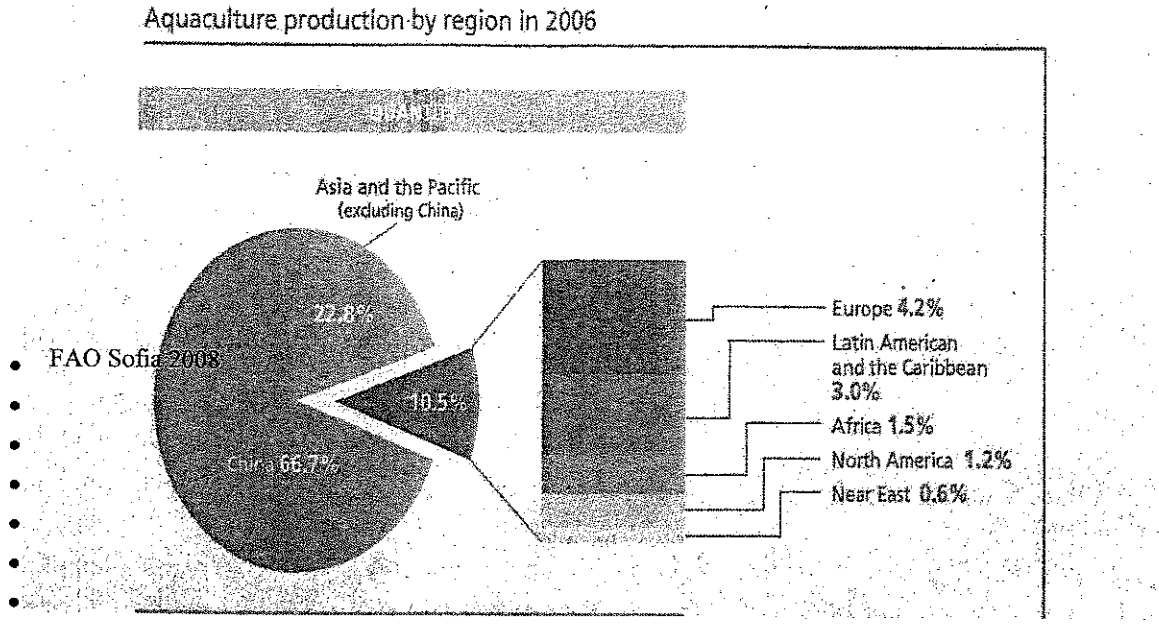
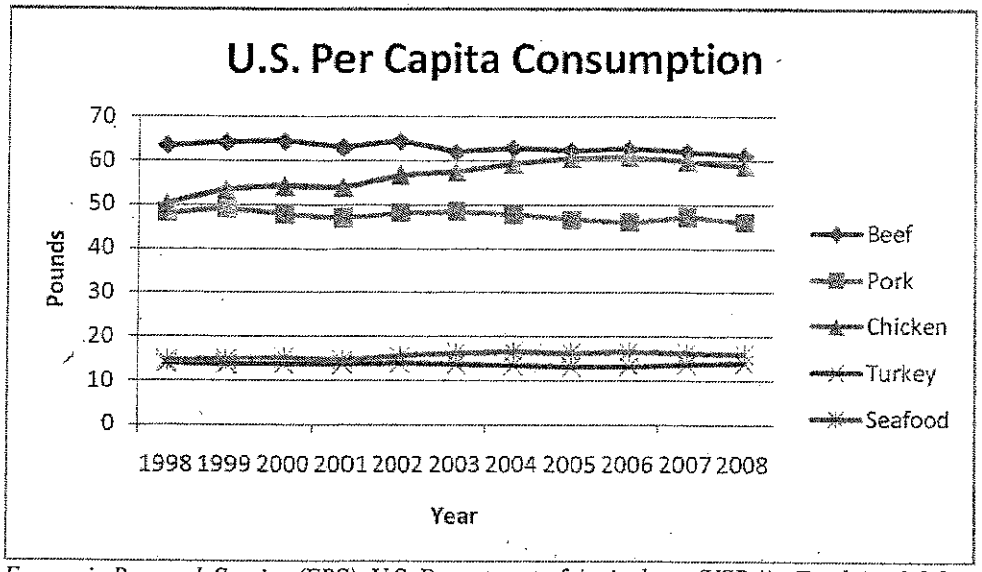
U.S. Aquaculture Facts January 2011



- Fifty percent of all fish production in the world comes from aquaculture (FAO)
- Global wild caught fisheries will remain static at approximately 92 million metric tons (FAO) if management practices are in place and enforced to help maintain sustainability
- Worldwide, by 2030 an additional 37 million metric tons of food fish will be required based solely on population growth (FAO)
- United States currently imports between 85 and 88% of all the seafood that is consumed. Some of that product is produced in countries that do not have strong food safety and environmental protection/sustainability policies in place.
- In 2009, U.S. imports of edible fishery products were valued at $13.1 billion (NMFS)
- U.S. annual consumption of seafood decreased to15.8 pounds per capita in 2009 despite all of the positive health benefits of increased seafood consumption

U.S. annual per capita meat consumption (USDA)



Economic Research Service (ERS), U.S. Department of Agriculture (USDA). Food Availability (Per Capita) Data System. http://www.ers.usda.gov/Data/FoodConsumption.

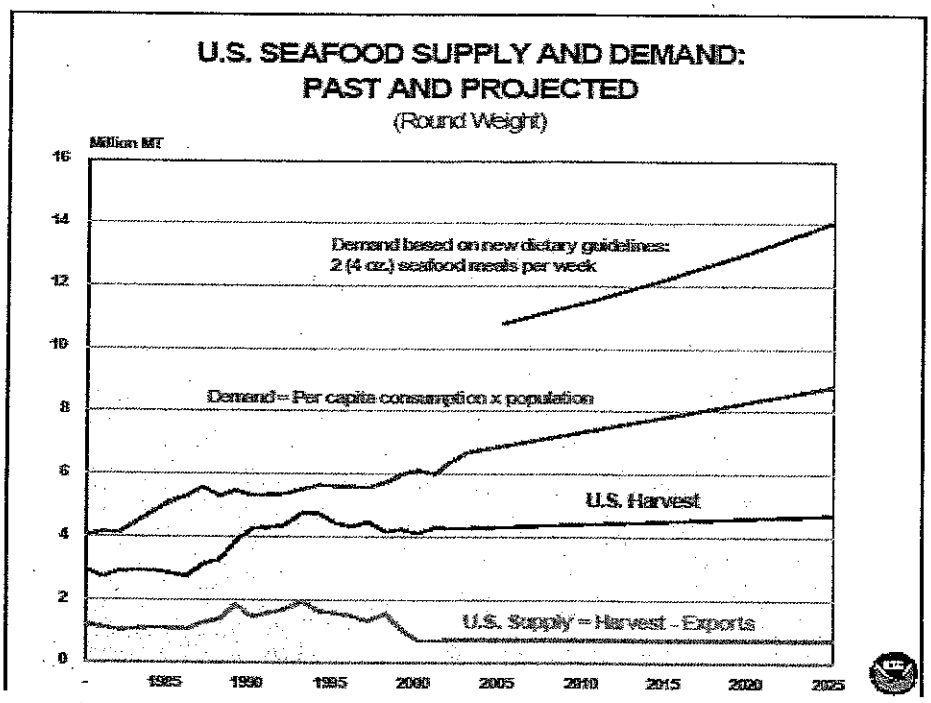
- Aquaculture increasingly contributes to the U.S. top ten fish and shellfish consumed (*at least part of the production of the products in shaded cells is aquacultured)*

Top Ten Species Groups

	2009		2008		2007		2006	
	Species	**Lbs**	**Species**	**Lbs**	**Species**	**Lbs**	**Species**	**Lbs**
1	Shrimp	4.10	Shrimp	4.10	Shrimp	4.10	Shrimp	4.40
2	Canned Tuna	2.80	Canned Tuna	2.80	Canned Tuna	2.70	Canned Tuna	2.90
3	Salmon	2.04	Salmon	1.84	Salmon	2.36	Salmon	2.03
4	Pollock	1.45	Pollock	1.34	Pollock	1.73	Pollock	1.64
5	Tilapia	1.21	Tilapia	1.19	Tilapia	1.14	Tilapia	0.996
6	Catfish	0.85	Catfish	0.92	Catfish	0.88	Catfish	0.969
7	Crab	0.59	Crab	0.61	Crab	0.68	Crab	0.66
8	Cod	0.42	Cod	0.44	Cod	0.47	Cod	0.51
9	Clams	0.41	Flatfish	0.43	Clams	0.45	Clams	0.44
10	Pangasius	0.36	Clams	0.42	Flatfish	0.32	Scallops	0.31
Total All Species		**15.8**		**16.0**		**16.3**		**16.5**

National Fisheries Institute, www.aboutseafood.com

- Projected U.S. market opportunity. U.S. fisheries currently contribute approximately 1 million metric tons to the domestic seafood supply. Based solely on population growth, U.S. seafood demand is projected to rise to 9 million metric tons by 2025. If Americans began consuming the recommended 2 seafood meals per week, the demand would increase to 14 million metric tons (NMFS)



NOAA Fisheries Service

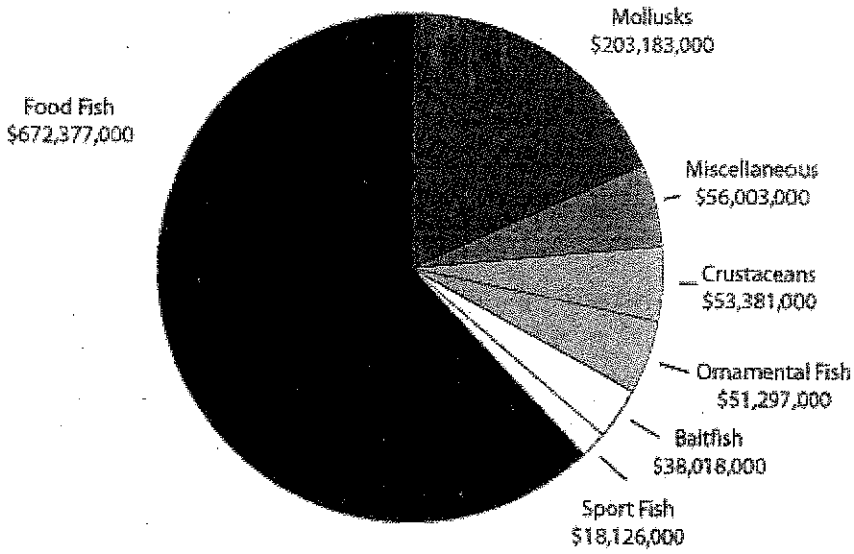
- Currently, there are 6,400 U.S. aquaculture farms producing $1.4 billion in farm gate sales contributing over $8 billion to the U.S. economy at large. (USDA)

- In 2005, the top aquaculture producing states were Mississippi-$249 million in farm gate sales, Arkansas- $110 million, Alabama- $102 million, and Louisiana- $101 million, and Washington $93 million. (USDA)

Note: Both the industry value ($1.4 billion) and number of farms (6,400) have been adjusted upward in the statistics above, but these charts provide a snapshot of the industry in 2005.

Value of Aquaculture Products Sold by Type: 2005

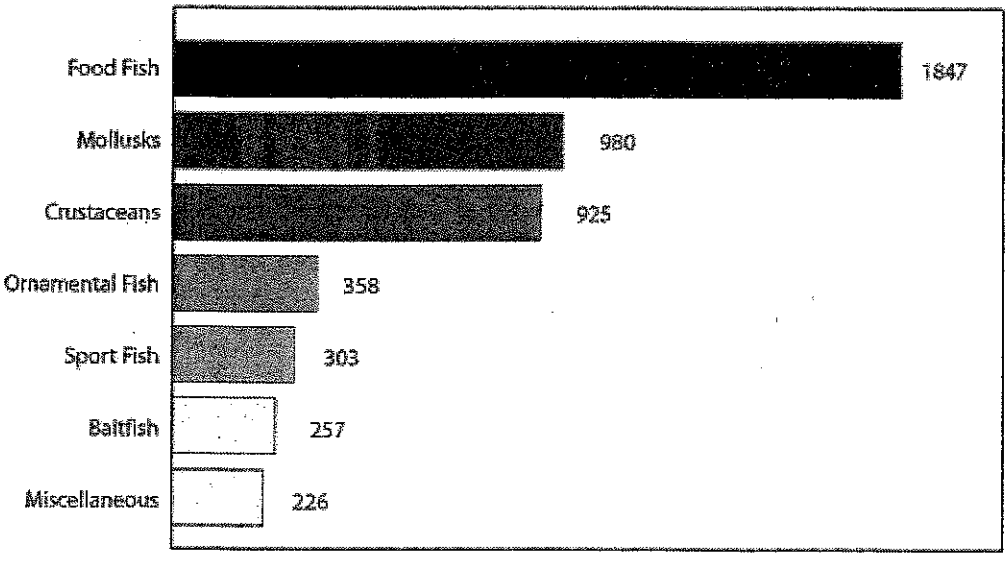
U.S. Total - $1,092,386,000



Source: 2005 Census of Aquaculture, USDA-NASS
Totals may not add due to rounding

Aquaculture Farm Count by Type

U.S. Total - 4,309



Source: 2005 Census of Aquaculture, USDA-NASS
Individual category totals do not equal U.S. total since some farms produce multiple products.

Seafood Inspection

Hazard Analysis Critical Control Point - (HACCP) Inspection is mandated by the U.S. Food and Drug Administration for all seafood ***processors and warehousers.***

Aquaculture producers are exempt from the requirement for a HACCP Plan. Treatment with carbon dioxide, bleeding, washing, and icing of otherwise unprocessed fish by the aquaculture producer is an integral part of the process of harvesting and getting the fish to market, and is, therefore, not considered to be processing. However, heading, gutting, or packaging of fish (e.g. retail or wholesale packages or cartons) performed by the aquaculture producer is considered processing, and would subject the producer to coverage under the regulations

HACCP is a preventative, not reactive, management system in which food safety is addressed through the analysis and control of biological, chemical, and physical hazards from raw material production, procurement, and handling, to manufacturing, distribution, and consumption of the finished product.

HACCP is not a stand-alone system. It must be used along with Standard Sanitation Operating Procedures (SSOPs).

Seven principles of HACCP

1. Conduct hazard analysis
2. Determine the critical control points
3. Establish critical limits
4. Monitor each Critical Control Point (CCP)
5. Establish corrective actions
6. Establish verification procedures
7. Establish record-keeping and documentation procedures

Country of Origin Labeling

Country of origin and method of production (farm-raised or wild-caught) labeling is mandated by USDA for all retail establishments that have a Perishable Agricultural Commodities Act (PACA) license. PACA licenses are required for all businesses engaged in the selling of fresh and frozen fruits and vegetables at retail with an annual sales invoice value of more than $230,000.

PACA definition *excludes* butcher shops, *fish markets,* and exporters.

U.S. origin farm-raised fish and shellfish must be derived exclusively from fish or shellfish hatched, raised, harvested, and processed in the U.S.

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NATIONAL Aquaculture ASSOCIATION

Working With the Media

The market opportunities for U.S. farm-raised seafood are enormous, but the domestic aquaculture industry cannot reach its full potential unless we have informed consumers who want our products. Using environmentally sound practices, the U.S. aquaculture industry produces high quality, wholesome products that can improve the lives of consumers in many ways. If we want to grow our markets, we need to communicate that message effectively.

The basic task is to ensure that the public hears, again and again, ***positive upbeat messages*** about farm-raised fish and shellfish ***from as many different sources*** as possible. If problems arise, we need to confront them and provide clear, concise, and rational answers.

Reporters are often looking for a regional angle on stories and turn to local businesses and experts. That means that ***you*** may be asked to comment on stories or provide background information. This toolbox is designed to help you act as an aquaculture ambassador. If you want additional assistance and support, turn to the National Aquaculture Association (NAA), your local extension agent, Sea Grant agent, or department of agriculture representative.

Take every opportunity to tell a positive story. Use every opportunity to spread the good news. Aquaculture products raised in the United States must meet a range of different federal and state standards for environmental standards and product wholesomeness. An aggressive proactive media outreach program provides the opportunity to educate and communicate a positive message prior to any negative events. We need to convince the media and the public on our terms, instead of waiting for possible negative stories that put us in the position of having to respond.

Step 1: Build Alliances

Let's get the message out. How can we do it? First and foremost, we need to work together and cooperate. That means cooperating with U.S. wild fishery interests, restaurants, and retailers. We all have a common interest—selling seafood. Build alliances. Look at the positive nutrition information from groups like the American Heart Association and the American Diabetes Foundation. Many of those groups advocate increased consumption of seafood for good health. Environmental groups that produce seafood choice lists, advocate the consumption of certain farm-raised products. Find out if those are the ones that you produce. Sports fishing clubs are a good opportunity to spread the word. U.S. aquaculture has a long history of providing recreational fishing experiences.

Step 2: Seize every opportunity

Take advantage of any opportunity that becomes available to get out the message. Enlist others in the cause. We can't afford large campaigns and media buys, so we need to identify less expensive ways to get the message out. Is there a restaurant association in town? Would

they like to know more about aquaculture? What about local groups that are looking for speakers? Not only are you educating the public, but you also are building your market. An important benefit is that you give people a positive impression of aquaculture.

Step 3: Eliminate the seafood mystique

People are confused by seafood. Everyone likes to feel knowledgeable, and most people don't when it comes to seafood. There are over 1,000 different species of finfish and shellfish available in the United States marketplace. Fish and shellfish are grown, harvested, and processed in many different ways. As the global market expands, products like swai, basa, and tra quickly gobble up market share. The more the consumer knows about seafood, the more comfortable he or she will feel with the product. Monitor what is being said in the media. Read the National Aquaculture Association's (NAA) Industry Updates and Action Alerts and subscribe to free electronic newsletters to keep up-to-date on issues relating to aquaculture.

Step 4: Become an aquaculture advocate

Occasionally, a reporter will schedule a formal interview, but most will simply call and ask you to provide answers on the spot. It is good to be prepared.

Develop three key points. These points need to convey important information about United States aquaculture. Your goal should be to discuss these points whether or not the reporter asks about them. Use the opportunity to tell our industry story. Use government/agency websites to support your position if necessary. The National Aquaculture Association (NAA) website (www.thenaa.net), the NOAA Fisheries Service (www.nmfs.gov), and the Aquaculture Information Network (www.aquanic.org) are good resources

Don't be misquoted. Make sure that the reporter fully understands what you are saying. If the interview deals with an issue for which the National Aquaculture Association (NAA) has a written policy or press release, provide a copy to the reporter to help ensure accuracy. Ask the reporter to read the release so that you can respond to any questions. When dealing with the electronic media, be careful not to provide any negative sound bites. Don't be led into traps.

Try to anticipate negative questions. If there has been a negative story about seafood safety, the reporter may ask you if all seafood is safe. The answer is that "For the average American, the positive health benefits of increased seafood consumption far outweigh any potential risks. As with any food, no matter how healthful, the key to good health is to eat a variety of foods and seafood fits the bill with all of the varieties that are available in the marketplace." Stick with the facts.

Restate your main points. Ask if your comments made sense and if there are any questions that haven't been answered. Always invite the reporter to call you if they find that they have additional questions.

When talking to a reporter:

- Be positive. Use positive words
- Ask the reporter to repeat the question if you don't fully understand it.
- Answer each question directly. If you don't know the answer, admit it and say that you will try to find the answer and get back to them. Remember there are often deadlines involved so your response will need to be quick. Even if you can't find an answer, get back to the reporter.

- If you can't answer a question, contact the National Aquaculture Association (NAA) or refer the reporter to an expert in the field.
- Be concise. Use short simple sentences.
- Use concrete words. Try to create images to make your point clear. Anecdotes and case histories are useful.
- Use language that the public can understand. Avoid jargon and technical terms.
- Maintain eye contact with the reporter. When you first meet the reporter, determine what color eyes they have.
- When you have answered a question, stop. Don't go into too much detail, as it may confuse the issue.

Avoid:

- Don't use technical jargon and acronyms. Remember, there are many terms that the general public won't understand.
- Never volunteer or repeat negative or inaccurate information.
- Never belittle another member of the seafood industry.
- Never lie, guess, or speculate.
- Never say "no comment." The reporter will naturally assume that you are hiding something. You can say, "I really don't know enough about that to comment, but I can provide a contact who can do a better job of explaining the situation."
- Never "go off the record." **There is no such thing.**
- Never get angry with a reporter.

Do your homework. If you have time, learn about the reporter. Has he or she done stories about aquaculture in the past? Positive or negative? Research the topic. Review the National Aquaculture Association (NAA) question and answer brochure; information in that publication will help you answer negative questions in a positive manner. The National Aquaculture Association is the best source of information. If a reporter asks for comments on a specific piece of legislation or during a crisis, call the National Aquaculture Association to find out the association position. If a reporter wants an immediate comment, tell them you will get back to them within a specific period of time. That will give you the opportunity to get the facts and craft your response. Many reporters wait until the last minute to make calls and are working on a deadline. Even if you can't find the answer, get back to them.

Issues Management in the Age of the 24-Hour News Cycle

Because the consumer doesn't have a good understanding of seafood and even less knowledge about farm-raised seafood, there is an information gap between risk assessment and risk perception.

- Risk assessment is a function of ***accurate*** interpretation of scientific data.
- Risk perception is largely a function of the media in consort with people's own beliefs and biases. Food choice is a very personal and emotional issue.

Once a story is e-published, it travels around the Internet, which makes it more difficult to correct misinformation and disinformation. Stories that were news three years ago in the print

and traditional electronic media are still appearing on the Internet. This makes it even more important to be proactive.

Invariably, an incident will occur that may threaten to set the program off track—a contaminant story, a pollution alert, a seafood related illness.

The key to controlling damage in such a situation is to get the facts, formulate a message, and manage the story to keep it from getting out of hand.

- Avoid buying into negative stories.
- No doom and gloom. Stories about the industry being put out of business, decreasing sales, etc. tend to feed on themselves and grow.
- Be positive. Lead the story. The vast majority of seafood is safe and wholesome. Seafood is one of the best sources of dietary protein and other important nutrients.

Some media outlets grab stories without checking the accuracy of the facts or the reliability of the sources. Food choice and environmental concerns are very personal and emotional issues. They make headlines. Many stories greatly exaggerate the magnitude of problems. These stories tend to feed on themselves and breed secondary stories regarding the severity of the problem. Once the basic cast of the stories is set, it is an almost insurmountable task to reshape the message and get the true story out.

If a problem arises, do not dismiss the existence of problems, but explain them clearly, concisely, and rationally. Try to find data that supports your positive.

To minimize disinformation and misinformation, it is critical to get accurate information. If you are not sure of a response, the National Aquaculture Association (NAA) is the best source of information. Contacting the National Aquaculture Association will facilitate controlling the message and keeping stories from getting out of hand. Obviously, this cannot happen if the press and public get conflicting messages from various sources.

U.S. Farm-Raised Fish and Shellfish: The Healthy, Sustainable Choice

Working with Government Agencies

"If you are not part of the solution, you are part of the problem...."

If you want to influence the future of our industry, your individual voice must be heard. The National Aquaculture Association (NAA) can provide background information about pending legislation and regulation, develop a response strategy, and speak for the association, but actual grass roots input really counts. This is a time when we need many voices with a common message and this can mean a lot of hard work.

To be effective you might have to:

- Read a lot of documents
- Talk to people you don't know
- Go to meetings
- Speak out in public
- Write letters
- Send emails
- Talk a lot on the phone
- Join or form an association
- Maybe even get appointed to a committee

Why would you want to do all of this when you could be out taking care of your fish? After all, that's probably why you are in this business. However, if you don't become actively involved in the future of our industry, you may not have a fish farm.

More people than just fish farmers care about fish. Environmentalists, consumers, scientists, recreationalists, businesspeople, the tourism industry, and many others are involved and many of those groups have active voices in the government process.

Step 1: Learn About the System

Attend meetings and talk with other members of the industry. Read the National Aquaculture Association's (NAA) Industry Updates and Action Alerts to learn about issues that impact our industry.

Laws impacting aquaculture are passed at the federal and state levels. Once those laws have been signed by the President or Governor, it becomes the responsibility of individual agencies to develop rules and regulations to implement those laws. State laws and regulations can be more restrictive than federal laws, but they cannot be weaker. It is important to find out what rules and regulations are being considered and how they could impact your farm or business.

Step 2: Learn at What Points You Can Be Involved in the Process

The National Aquaculture Association (NAA) provides Industry Updates and Action Alerts on legislation and rule proposal to its members. The Federal Register is published daily and contains all rules, proposed rules, and notices issued by federal agencies. More information is available from the National Aquaculture Association, or on-line access is available at www.gpoaccess.gov/fr/ . When a rule is formulated, amended, or repealed, there is generally a 30, 60, or 90-day comment period, during which *ANYONE* can submit written comments. To streamline the process and allow greater public participation, the federal government has set up a website www.regulations.gov. You can find proposed rules at that site, provide an electronic comment, and view comments submitted by others. The federal government established this site so that it would easier for stakeholders to comment.

After the close of the comment period, the final rule is published in the Federal Register. Generally, the final rule statement includes responses to comments received and indicates any changes in the rule that were made as a result of those comments.

Each state has a similar process for state regulations. On-line access to the state register can be either by a direct link or through a university law library. The best way to find the site providing access for your state register is by an electronic search.

In many cases, there are public hearings for both state and federal regulations and policies. Attend a public hearing and speak for the record. You can also submit written comments at those hearings.

Step 3: Reach Out

Call Your State and Federal Political Representatives

For some matters, you may wish to talk with your elected officials. Be sure to say that you are a voter from the legislator's district. If you represent a group such as a shellfish or finfish association, be sure to mention that affiliation and the number of members. Ask to talk to the representative's staff person assigned to aquaculture, fisheries, or environmental issues. People on Congressional/Legislative staffs can be very knowledgeable and helpful. They want to know what their constituents are thinking and they will pass your views on to your legislators. No one can be an expert in all areas. Politicians ***need*** your knowledge and input in order to make informed decisions. Remember to get the aide's and secretary's names and take notes for later contact. Make sure you can spell the names correctly.

Introduce yourself, describe your involvement in aquaculture, and discuss your concerns. Keep your call short-no more than 10 minutes. Rehearse a one-sentence description of your mission. Be prepared to relate at least one quick real life example of the need for the action that you are advocating. Make notes before you dial the phone number. Volunteer to provide additional information. Call again when you have new questions or would like to pass along additional information.

If something interesting is happening at your facility- maybe you are sending your first shipment of fish to Tokyo, Israeli scientists are visiting, or you are having a koi auction- let your legislators know. They might be interested in attending.

Invite representatives to visit your facility. If they do visit, make sure to send a thank you letter, any additional information you may have volunteered to send and provide a one-page summary of key issues. In your thank you letter, reemphasize key points.

Step 4: Learn More

Ask people where they get their information and check out those sources so you understand some of the different viewpoints that may be expressed. Try to understand hidden agendas. Politicians and agency personnel must be responsive to a wide range of constituencies. Environmental groups and recreational fishing associations can be very vocal. What are the areas on which your viewpoints agree? Where do they differ? Think about areas where you can work together or where you might be able to reach a compromise.

Step 5: Get Active

Write letters/provide comments

In addition to writing to legislative and agency representatives, you might also want to write letters to the editors of local papers, trade magazines, and other publications. Many legislative and agency representatives read those publications. It isn't only when there is a difference of opinion about an issue that you should write a letter. If the lawmaker or agency agrees with your position, don't neglect to write a letter thanking them for their support. You may need their help later and establishing a relationship early can be helpful.

When writing to elected officials at the state and federal level address the letter correctly. On the envelope and on the inside heading refer to the elected official as "The Honorable (name)". The salutation should be: Dear Mr./Ms. (name) for members of the House of Representatives, Dear Senator (name) for members of the federal and state senate, Dear Representative (name) for members of the State House, and Dear Secretary or Commissioner (name) for cabinet officers.

Provide comments to rule proposals. Comments on federal rules and regulations can often be filed electronically at www.regulations.gov or follow the directions in the federal register. You can also find comments submitted by others at these sites. Don't depend on others to provide comments. It's our industry and we all need to be vocal. ***Don't use canned comments. Use your own words.***

- Thank you for the opportunity to comment on ------(identify the rule, regulation or law)
- As when making oral comments, identify yourself and why you should be heard. This portion of your comments will always be the same. Keep a short paragraph on your computer identifying yourself. You can use this for both written and oral comments.
- State your concerns clearly and concisely.
- How will this rule affect your business?
- Thank the person for his/her assistance.

Attend meetings

Attending meetings will help you to understand the issues, familiarize you with the process, and allow you to meet the players.

Step 6: Get Organized

Join a Group, Start a Group, and Build Consensus

The National Aquaculture Association(NAA) can help you meet others involved in aquaculture, share views, be represented at meetings, kept up to speed on a variety of issues that impact our industry, and influence what is happening in Washington as well as in your state. Working closely with other people can be critical to your success in influencing decisions. Reasoned responses to scientific and other questions take time and effort to develop. A group of people with similar concerns can share the effort of preparing responses; broaden the range of expertise and knowledge relative to an issue; and share expenses of participation and, if necessary, of independent analyses of data and assumptions.

Step 7: Make Your Voice Heard

Attend open public meetings and hearings to remain informed about current and proposed policies and initiatives. If an issue concerns you, provide oral or written comments.

When providing public comments at a meeting or hearing, be prepared:

Identify yourself and your experience. Give your name and a very brief explanation of your involvement with the industry. "Good afternoon, my name is Sam Salmon and I own and operate Salmon's Trout Farm. Salmon's Trout Farm was started by my grandfather during the depression and we now produce 500,000 pounds of trout each year for food and recreational stocking." Your initial statement adds to your credibility and establishes you as a knowledgeable person.

Organize your thoughts. Use notes. It will keep you on message and help you to feel more comfortable.

Be brief and to the point. Don't talk too long. People lose interest if you ramble. Clearly, summarize your message: "The bottom line is..." "The point is...." Make sure that your listeners know exactly what your message is. Indicate that you will be happy to provide additional information if needed. Thank the group for listening.

Be specific and constructive. Don't become emotional. Statements like "You're going to put me out of business" set up an adversarial relationship and should be avoided. Using the pronoun "we" as opposed to "you" helps to establish what should be a working relationship. "We can find a solution to this problem." A better way to phrase your concerns might be "If this regulation passes, it will significantly increase my cost of production and will have minimal impact on improving environmental quality. A better approach might be... That approach will allow me to remain competitive with imports that now make up over 85% of all the fish and seafood consumed in the United States." In this scenario, you have provided an alternative approach and a reason why that approach might be more feasible.

Keep your remarks on point. Indicate that you have read the regulation or are familiar with the issue. You might have to do some homework. If it is a state issue, how have other states handled the same problem? This is where having a state association comes in handy. One person can do the research and share it with the larger group. You can also talk to your state's aquaculture coordinator, Sea Grant agent, or

Cooperative Extension agent to find out if he or she has some insights into the problem or could make a few phone calls on your behalf. Use these resources. It's our tax dollars that pay salaries.

Respect the science and if you don't agree, provide credible evidence. Again, you can use state and National Aquaculture Association resources to help find alternative data sources. Talk to your state's aquaculture coordinator, Sea Grant Agent, Cooperative Extension Agent or Farm Bureau. You can use your own logbooks. "We routinely test our effluent and have never recorded such high levels of ...." Volunteer to help develop data if necessary and appropriate.

Adapted for the aquaculture industry from: Fish or Cut Bait: How to Participate in the Fisheries Management System (3rd edition) by Bonnie McCay, Carolyn Creed and Steven Gray, a publication of The Fisheries Project, Rutgers the State University, New Brunswick, NJ, 55 Dudley Road, New Brunswick, NJ 08901.