

Whole Foods Market
Seafood Quality Standards
Farm Standards for Finfish and Shrimp

July 1, 2008

Version 1.0

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Introduction

Whole Foods Market is pleased to present our newly enhanced Quality Standards for farmed seafood. These standards specify our minimum requirements and expectations for all producers supplying or seeking to supply farmed seafood to Whole Foods Market. These standards apply to producers operating in all countries and with all methods of production.

This document is designed for individual farms or producer groups that sell farmed seafood to Whole Foods Market. In this document, “fish” refers to all species, including crustaceans. Please note that we have separate Quality Standards in place for farmed salmon and these standards are not included below. In addition, note that we have provided “*producer guidance*” to define terms used in standards or to suggest possible approaches for achieving the standards; the suggestions under *producer guidance* are not mandatory.

These standards were developed focusing on the species listed below but also apply to other farmed fish and shrimp. These standards do not apply to mollusks.

- Tilapia (including *Oreochromis mossambicus* and hybrid species)
- Channel Catfish (*Ictalurus punctatus*)
- Rainbow Trout/Steelhead (*Oncorhynchus mykiss*)
- Pacific white shrimp (*Litopenaeus vannamei*)
- Black tiger shrimp (*Penaeus monodon*)
- Arctic char (*Salvelinus alpinus*)
- Sea bream (*Sparus auratus*)
- Sea bass (*Dicentrarchus labrax*)
- Atlantic cod (*Gadus morhua*)

While these standards are formal and require mandatory compliance from producers, this is a living document. As new information, farming techniques, and technology become available, we will update our standards to reflect opportunities for improvement. We fully recognize that not all producers will be able to meet these standards. Our expectation is that only the most innovative companies committed to maintaining healthy ecosystems and mitigating the environmental impacts of aquaculture will likely qualify.

While these standards require that producers take important environmental steps forward, we also acknowledge that further improvement in the industry’s environmental performance is necessary if we are to more fully protect our ecosystems. To promote such progress, Whole Foods Market is establishing a purchasing preference to source from suppliers that develop innovative technologies and practices such as integrated multi-trophic aquaculture (i.e. polyculture) and closed containment systems that substantially reduce their environmental impacts, while at the same time meeting Whole Foods Market’s quality and cost criteria and other standards.

Summary Table of Key Metrics

NOTE: Not all standards are included in table below.

Reference Number	Metric	Date for Compliance
2.1.2, 2.2.2	Broodstock and grow-out stock must be hatchery-raised	immediate
2.2.3	Shrimp post-larvae must come from SPF or SPR broodstock	immediate
3.1	No preservatives permitted, including sodium bisulfite, sodium tri-polyphosphate (STP), and sodium metabisulfite	immediate
3.1	No Antibiotics on fish and shrimp intended for grow-out permitted	immediate
3.1	No growth hormones permitted	immediate
3.1	No Methyl testosterone permitted on grow-out fish	immediate
3.1	No in-feed veterinary medicines, including parasiticide treatments such as emamectin benzoate, permitted	immediate
3.1	Use of malachite green, crystal violet, and Tributyltin compounds (TBT) at any stage of egg, smolt, or fish production prohibited.	immediate
3.1	No organophosphates permitted	immediate
3.2	2 parasiticide bath treatments allowed	July 1, 2011
3.2	1 parasiticide bath treatment allowed	July 1, 2013
3.2	No parasiticide treatments allowed	After July 1, 2013
4.4	No slaughterhouse by-products from avian or mammalian species permitted in feed.	immediate
4.6	Annual reporting on progress toward meeting Maximum Fish In, Fish Out ratios	Yearly reporting
4.9	Only non-synthetic pigment sources included in feed	July 1, 2010
5.1	Annual testing for assessing progress toward meeting maximum contaminant levels: -PCBs: 0.011 ppm (11 ppb) -WHO-TEQs (dioxins, furans, dioxin-like PCBs): 2.16 ppt (parts per trillion) or pg/g	annual

	-Mercury: 0.22 ppm	
6.1.4	Annual reporting on progress toward eliminating toxic anti-foulants on nets	annual
6.2.1	Calculation of total nitrogen and total phosphorus inputs	Annual
6.2.2	Effluent monitoring and calculation of loads	Monthly
6.3.1	Salinization prevented	immediate
7.1	Legal approval for aquaculture production at farm site required	immediate
7.3	No conversion of ecologically sensitive areas (e.g. wetlands, mangroves) into new farms or sites, or for expanding current farms, permitted	immediate
7.4	Restoration of at least a hectare of new habitat for each hectare of wetland or mangrove forest previously converted to ponds (i.e. a 1:1 ratio)	July 1, 2013
8.1	For net pens/net cages: Detailed protocols for preventing escapes	immediate
8.2	For finfish in net pens/net cages and preferred for all species: Annual reporting on progress toward achieving counting accuracy of 99%	annual
9.1	Exclusion of wildlife predators or other non-lethal methods must be the first level of defense.	Immediate
9.7	No Acoustic Harassment Devices permitted	December 31 ,2008
10.1	Recall program in place	immediate
10.2	Tracking system to ensure the identity and history of all fish sold to Whole Foods Market from hatchery to market required	immediate

Section 1: Basic Requirements

1.1 Compliance with Government Regulations

Producers must comply with all local, state, and national regulations related to farm operations, including those listed below. In addition, producers must inform Whole Foods Market of any citations to government regulations. In response to citations, producers must inform Whole Foods Market of specific corrective actions that they plan to take.

- Farm siting and land use zoning
- Environmental assessments/reviews
- Water quality
- Movement and quarantine of animals to prevent introduction of exotic species
- Effluent discharges and monitoring requirements
- Mangrove protection and restoration
- Escapes
- Predator control
- Disease treatment
- Human health and safety
- Labor rights
- Local community involvement
- Payment of fees and taxes
- Processing facilities

1.2 Application/Farm Plan

Each farm must complete a written Whole Foods Market Application/Farm Plan that identifies practices implemented to ensure compliance with all applicable sections of Whole Foods Market Farmed Finfish and Shrimp standards. The plan must meet the following requirements:

- A written application must be submitted annually
- It must be current. If there are any changes in production practices, producers must update the document and re-submit to Whole Foods Market within one week.
- It must address all relevant areas covered by these standards
- It must reflect actual practices on the farm

Farms that have written Standard Operating Procedures (SOPs) or a Quality Manual can provide a copy with their application.

1.3 Inspection and Audits

All documentation, records, farms (including hatcheries), and processing plants are subject to annual inspection by Whole Foods Market and audit (both announced and unannounced spot inspections) by independent third-party auditors, selected by Whole Foods Market. Third party audits must be paid for by suppliers.

1.4 Records

Each farm must maintain and provide the auditor full access to records sufficient to document compliance with all applicable Whole Foods Market Farmed Finfish and Shrimp Standards. Records must be signed by farm owners as accurate. Inaccurate reporting could lead to suspension of business with Whole Foods Market. The records requested will include, but are not limited to the following:

1.4.1 Farm Stock Information

- Source of any fish brought onto the farm for grow-out, with relevant batch number
- Number of fish delivered to the farm for grow-out, with relevant batch number
- Number of fish sold, with relevant batch number

1.4.2 Health

- All vaccinations applied, including product and date of administration. Include records confirming approval for use from veterinarian or animal health professional.
- Dates of health checks conducted on broodstock and grow-out stock (e.g. by PCR-screens)
- Data on incidences of disease or parasite outbreaks, including number of fish affected
- All treatments used, including antibiotics and parasiticides. Specify frequency of use.
- Number of mortalities
- Cause of mortalities

1.4.3 Feed

- Total annual production of fish
- Total annual quantity of feed used
- Annual calculation of Feed Conversion Ratio (FCR)
- Annual calculation of Fish In, Fish Out Ratio (also known as Feed Fish Equivalence Ratio (FFER)) (Contact Whole Foods Market for formula)
- Source of all feed purchased and contact information for the feed company
- Feed specifications, including all feed ingredients and percentage composition of feed. Specify inclusion rates of fishmeal and fishoil.
- Source fisheries for all fishmeal and fishoil used in the feed

1.4.4 Environmental Contaminants (PCBs, WHO-TEQs (dioxins, furans, and dioxin-like PCBs) and Mercury)

- Test results, according to the testing protocols outlined in Appendix A.

1.4.5 Nutrient Management/Effluent (See Standards 6.2.1 and 6.2.2)

- Calculate total nitrogen inputs in the form of feed and fertilizer (kg nitrogen/mt of fish produced in 1 year)
- Calculate total phosphorus inputs in the form of feed and fertilizer (kg phosphorus/mt of fish produced in 1 year)

For producers using feed OR fertilizer in ponds/tanks/raceways:

- Record concentrations of total phosphorus, total nitrogen, total suspended solids, or 5-day biochemical oxygen demand in effluent (mg/L or g/m³) at the end of the discharge pipe to ensure that samples are not contaminated by surrounding waters.
- Record total annual farm discharge, m³/year (amount of water discharged from farm annually).
- Calculate load of variable. Load of variable (kg/yr) = farm discharge in m³/year x annual concentration of variable (mg/L or g/m³) x 10³ kg/g

For net pens/cages:

- Percentage of nets treated with anti-foulants

1.4.6 Escapes

- Records of number of escapes, including both large and small escape events
- Cause of escapes

1.4.7 Predator Interactions

- Descriptions of any predator interactions that have occurred, with details on injuries, and the species affected
- Records of any intentional or incidental lethal take of predators. For take of bird predators on farms in the United States, a copy of the annual report to the U.S. Fish and Wildlife Service is sufficient.
- Records of any lethal control methods used

1.5 Emergency Procedures

Each farm must have written emergency procedures to follow in case of an emergency. Anyone working at the farm or involved in farm management must be aware of the procedures in place and actions to take should an emergency occur. Emergency procedures must be posted in a prominent location to be readily available for reference in the event an emergency occurs.

Producer guidance:

- Emergency procedures could include plans for responding to storms or natural disasters, fire, disease outbreak, emergency water shut off, or power failure.

1.6 Employee Training

Initial and ongoing training must be provided to all individuals who carry out operational management tasks covered under these standards.

Producer guidance:

- Training should provide an overview of the entire operation as well as specific training related to the tasks that will be required.
- Training can be experience-based or through a formal program.
- Written confirmation of attendance of training or achieving expectations of training should be available.
- Training should provide information on the specific requirements of the Whole Foods Market standards for all responsible staff.

1.7 Biosecurity Procedures

Each farm must implement and maintain a written biosecurity program. The program must include measures taken to avoid the introduction of pathogens from outside sources such as incoming stock, visitors, and trucks or equipment.

Section 2: Breeding and Source of Grow-Out Stock:

2.1. Breeding Program

2.1.1.

The use of genetically modified or cloned fish is prohibited.

Producer guidance:

- Selective breeding is not considered genetic modification and is allowed.
- Genetically modified is defined as recombinant DNA or similar gene splicing techniques.

2.1.2.

Broodstock must be hatchery-raised, rather than wild-caught, except that small amounts of wild stock may be used to maintain genetic diversity of broodstock.

Exception for Black tiger shrimp:

Wild-caught broodstock may be used until hatchery-raised broodstock become commercially available.

2.2. Source of Grow-Out Stock

2.2.1

Exotic species can only be cultured if a substantial commercial industry for farming that species already exists or if scientific risk analysis demonstrates negligible risk to the surrounding ecosystem. To raise exotic species producers must demonstrate they have followed ICES Code of Practice on the Introductions and Transfers of Marine Organisms 2004. Farms in the United States must also meet all state requirements for the introduction of new species.

Producer guidance:

- Negligible risks might include species that cannot survive and establish if they escape (e.g. there are no water bodies connected to the farm, or water temperatures are too cold in surrounding water bodies), or if the production system has no risk of escape (e.g. re-circulating tank systems with sand filters).

2.2.2

Grow-out stock must be raised in a hatchery. Wild-caught grow-out stock is prohibited.

Producer guidance:

- Grow-out stock includes shrimp post-larvae and fish fingerlings/fry/smolt.
- Wild-caught grow-out stock includes both targeted catch and bycatch, both of which are prohibited.

Additional for shrimp (Pacific white shrimp (*Litopenaeus vannamei*) and Black tiger shrimp (*Penaeus monodon*):

2.2.3

To avoid introducing and spreading pathogens to shrimp farms, producers must stock post-larvae from Specific Pathogen Free (SPF) broodstock. If unavailable, producers must then use Specific Pathogen Resistant (SPR) shrimp.

Producer guidance for shrimp:

- SPF broodstock are defined as those animals that originate from stocks which have a documented history of being free of specific pathogens for at least two years.
- Producers should use the World Organization for Animal Health's (OIE)'s current list of shrimp pathogens for monitoring broodstock in SPF surveillance programs. Targeted SPF surveillance programs should keep current on possible changes to the OIE list. The current list includes the following pathogens: Taura Syndrome (TSV), White spot disease (WSSV), Yellowhead disease (YHV), Tetrahedral baculovirus (BPV), Spherical baculovirus (MBV), Infectious hypodermal and haematopoietic necrosis (IHHNV), and Infectious myonecrosis (IMNV).
- Broodstock producers may also breed shrimp for specific pathogen resistance (SPR), yielding SPF/SPR shrimp.

Section 3: Drug and Synthetic Chemical Use

3.1

The Following Drugs and Synthetic Chemicals are prohibited:

Prohibited	Producer Guidance
Preservatives	Prohibited chemicals include, but are not limited to, sodium bisulfite, sodium tri-polyphosphate (STP), and sodium metabisulfite.
Antibiotics on all fish and shrimp intended for grow-out, both in hatcheries and on farms	<ul style="list-style-type: none"> • Grow-out fish includes larvae, post-larvae, fry, smolts and fingerlings • Grow-out fish exhibiting symptoms associated with disease must receive veterinary attention, and if diagnosed with disease, must be treated as appropriate. If fish require treatment with medications prohibited by Whole Foods Market (e.g. antibiotics), the pen/tank/pond/raceway must be marked for identification and fish from that system cannot be sold to Whole Foods Market.
Sub-therapeutic use of antibiotics on broodstock and all larval stages of grow-out fish and shrimp in hatcheries	<ul style="list-style-type: none"> • Broodstock may only be treated with antibiotics if diagnosed with a disease by a veterinarian • Sub-therapeutic use refers to prophylactic treatment, i.e., antibiotics used as preventative treatment.
Growth hormones	
Methyl testosterone on grow-out fish	For sex reversal
Medicines used in an off-label manner unless prescribed by the farm's veterinarian.	Any such medicine must have the prescribing veterinarian's label affixed over the manufacturer's label that outlines the prescribed method of usage, duration of administration and withdrawal time.
Use of malachite green, crystal violet, and Tributyltin compounds (TBT) at any stage of egg, smolt, or fish production.	
In-feed veterinary medicines, including parasiticide treatments such as emamectin benzoate	
Organophosphates	

3.2

Producers must cease using all synthetic parasiticides on fish destined for Whole Foods Market within five years of implementation of these standards (by July 1, 2013). Beyond this date, if preventative methods fail and fish must be treated with synthetic parasiticides, those fish cannot be sold to Whole Foods Market. Within the five year allowance, parasite treatments can only be used when approved by a veterinarian. Parasiticides must not be administered prophylactically.

Within the first three years of the phase-out (July 1, 2008 to July 1, 2011), producers may use synthetic parasiticide bath treatments a maximum of two times during one grow-out cycle. Within the last two years of the phase-out (July 1, 2011 to July 1, 2013), the number of treatments per grow-out cycle must be reduced to a maximum of one treatment.

Producer guidance:

- Alternatives to synthetic chemical treatments could include using vaccines, cleanerfish, mechanical solutions, sea lice traps, or other innovative solutions.
- Use of hydrogen peroxide as a parasiticide is permitted and need not cease five years following implementation of these standards.

Section 4: Feed

NOTE: Whole Foods Market acknowledges that some producers may raise species in systems where cultured fish feed on organisms living in the ecosystem (e.g. shrimp in extensive pond systems that feed on benthic organisms) and therefore do not require formulated feeds. The following standards apply only to those producers using added feeds.

4.1

All feed must comply with regulations of the country where Whole Foods Market sells seafood products.

4.2

Feed systems must deliver diets that are nutritionally complete for species cultured.

4.3

Feed must not be adulterated.

4.4.

Slaughterhouse by-products from avian or mammalian species are prohibited in feed.

4.5

Fishmeal or fishoil used in feed must come from fish of a different species than fish grown for market.

4.6.

Whole Foods Market's goal is to reduce pressure on populations of wild fish and to decrease reliance on reduction fisheries for feed by moving toward the target level of no greater than a 1:1 Fish In, Fish Out Ratio. To evaluate progress towards meeting this goal, producers must report their ratios yearly. Whole Foods Market will review reports to evaluate progress.

- **Shrimp (*Litopenaeus vannamei*): 1:1**
- **Black tiger shrimp (*Penaeus monodon*): 1.5:1**
- **Cod: 1:1**
- **Steelhead/Rainbow Trout 1:1**
- **Tilapia: 0.25: 1**
- **Channel Catfish: 0.35:1**
- **Other finfish and crustaceans: 1:1**

Producer guidance:

- The Fish In, Fish Out Ratio (Feed Fish Equivalence Ratio) is the ratio of wild-caught fish consumed as fishmeal and/or oil to fish produced.
- Contact Whole Foods Market for the formula to use in calculating this ratio.

- Explore the feasibility of using by-products from fish processing (i.e. trimmings from processing wild or farmed fish and crustaceans), provided that the by-products are of a different species than fish grown for market. By-products of fish processing do not need to be counted in the Fish In portion of the ratio. Bycatch (i.e. incidental catch in wild-capture fisheries) is not considered a by-product and is prohibited for use in feed.
- Explore other innovative methods for lowering the overall amount of fishmeal and fishoil in feed ingredients. For example, consider using marine worms or algae-based products as a source of essential fatty acids to reduce the amount of fish oil used.

4.7

Feed, including by-products of fish processing, cannot be sourced from fisheries determined by independent, peer-reviewed science to be overfished, over-exploited, depleted, or in decline. To reduce pressure on populations of wild fish, fish products used for feed will be preferentially sourced from by-products of fish processing.

Producer guidance:

- Whole Foods Market will review fisheries to determine acceptability using the best available science from national and international agencies and non-governmental organizations.

4.8

Feed must be processed to kill microorganisms and maintain its integrity in the water for optimal efficiency. Use of “trash fish” for feed is prohibited.

Producer guidance:

- Cooking ingredients is required to avoid disease and the deterioration of water quality from the high oxygen demand of raw food or organisms.
- “Trash fish” is a term used to define fish with low economic value that is used unprocessed for feed. Concerns about using trash fish as feed include resource depletion, poor feed conversion ratios, and high nutrient impacts.
- Removing exotic species (e.g. carp from freshwater systems) for the purpose of restoring native fish and utilizing these fish for feed ingredients is permitted. These fish are not considered “trash fish” for the purposes of these standards.

Additional for species using added colorants (e.g. steelhead/rainbow trout, Arctic char):

4.9

All feed purchased must contain only non-synthetic pigment sources within two years of implementation of these standards (by July 1, 2010).

Producer guidance:

- As a by-product from processing, shrimp shells are permitted.
- Phaffia yeast is permitted.

Section 5: Environmental Contaminants

5.1

Whole Foods Market's goal is to reduce concentrations of PCBs, TEQs (dioxins, furans, and dioxin-like PCBs), and mercury in fish to the levels listed below. To evaluate progress towards meeting this goal, producers must test fish for contaminants according to the protocols listed below and keep records of their results. Whole Foods Market will review records to evaluate progress.

Contaminant group	Maximum Level
PCBs	0.011 ppm (11 ppb)
WHO-TEQs (dioxins, furans, dioxin-like PCBs)	2.16 ppt (parts per trillion) or pg/g
Mercury	0.22 ppm

Producer guidance:

- Maximum allowable contaminant levels are based on the values used by the U.S.EPA: 227 g meal size (8 ounces) and 70 kg body weight.
- Maximum allowable levels of PCBs and mercury are based on the U.S. Environmental Protection Agency's (EPA) National Guidance for Assessing Chemical Contaminant Data. Whole Foods Market has chosen to use the EPA's standards for seafood because they are the most protective standards available for human health. Until the EPA completes their dioxin reassessment, TEQs must meet the standards of the World Health Organization (WHO).
- Producers will test fish for contaminants **annually**.
- See Appendix A. for Required Sampling and Testing Methods

Section 6: Water Quality and Pollution Prevention

6.1 Inputs

6.1.1

Safe disinfectants are allowed for cleaning (e.g. at hatcheries). Any disinfectants used must be approved for use by the U.S. Food and Drug Administration, the U.S. Environmental Protection Agency (EPA), or the World Organization for Animal Health (OIE). Proper recommended procedures for disposal must be followed.

6.1.2

Use of raw (untreated) manure as fertilizer for promoting phytoplankton blooms in ponds is prohibited. Use of human waste—either treated or untreated—as fertilizer is prohibited.

Additional for ponds:

6.1.3

Liming materials used for neutralizing acidity in pond water or pond soils are permitted.

Additional for net pens/cages:

6.1.4

Whole Foods Market's goal is to purchase fish from farms that do *not* treat nets or net structures with copper-based anti-fouling agents (e.g. paints), or other toxic anti-foulant products, and which purchase new nets untreated. To evaluate progress towards meeting this goal, producers must annually report the percentages of nets that are treated. Whole Foods Market will review reports to evaluate progress.

Producer guidance:

- To control net-fouling organisms, producers could use methods such as air-drying, mechanical cleaning, or other non-toxic methods. Non-copper-based and non-toxic net treatments could also be acceptable alternatives.

6.1.5

Underwater power washing is allowed if producers can demonstrate that bio-fouling organisms are not building up underneath pens.

6.2 Nutrient Management/Effluent

6.2.1

Producers must work to minimize the negative impacts of effluent on receiving waters by reducing inputs of nitrogen and phosphorus. Producers must calculate total annual inputs of these nutrients per metric ton of fish produced in one year.

This information will be used to evaluate producers' progress in reducing nutrient outputs and preventing environmental impacts, such as eutrophication. Calculations of total inputs assume a consistent level of production. Therefore, reducing inputs would reduce outputs of nutrients.

Producer guidance for calculating inputs of nitrogen and phosphorus:

- Calculate total nitrogen inputs in the form of feed and fertilizer (kg nitrogen/mt of fish produced in 1 year)
- Calculate total phosphorus inputs in the form of feed and fertilizer (kg phosphorus/mt of fish produced in 1 year)
- Work with feed companies to get values of Total Nitrogen and Total Phosphorus if information is not printed on feed bags

Producer guidance for reducing nutrient inputs:

- Improve efficiency of feeding practices
- Reduce fertilizer use, if applicable

For producers using feed OR fertilizer in ponds/tanks/raceways:

6.2.2

An effluent monitoring system must be in place to measure discharges of effluent into receiving waters. Producers must measure at least one of the following variables, but are encouraged to monitor all variables: total phosphorus, total nitrogen, total suspended solids, or 5-day biochemical oxygen demand. Increasing the amount of water discharged to dilute effluent is prohibited. Monitoring should occur monthly.

This information will be used to develop performance metrics for nutrient loading, with which producers can measure future improvement in environmental performance. If degradation is found to be occurring, producers will have to implement an effluent treatment system.

Producer guidance:

- Monitor concentrations of total phosphorus, total nitrogen, total suspended solids, or 5-day biochemical oxygen demand in effluent (mg/L or g/m³) at the end of the discharge pipe to ensure that samples are not contaminated by surrounding waters.
- Record total annual farm discharge, m³/year (amount of water discharged from farm annually)
- Calculate load of variable. Load of variable (kg/yr) = farm discharge in m³/year x annual concentration of variable (mg/L or g/m³) x 10³ kg/g

For pond systems, producers can improve efficiency of water use and minimize impacts of effluent by:

- Reducing amount of water discharged
- Preventing overflow after heavy rains by providing extra space in ponds.
- Reusing water where possible. For example, use closed pond systems or re-circulating tank systems.

Possible methods for treating effluent could include:

- Holding effluent in settling ponds
- Using constructed wetlands.
- Using integrated multi-trophic aquaculture systems (polyculture)
- Methods for minimizing the impacts of effluent may be outlined in a National Pollutant Discharge Elimination System (NPDES) permit for producers operating farms in the United States.

6.2.3

Dead fish must promptly be removed from enclosures. Inspections for dead fish must occur daily (weather permitting) to maintain good water quality in culture systems, prevent transmission of disease, and to avoid attracting predators. Dead fish must be disposed of appropriately to avoid negative impacts on quality of surface or groundwater.

Producer guidance:

- Producers should follow local regulations governing appropriate disposal of dead fish, which could include methods such as burial or composting.

[Additional for shrimp and other species raised in saline ponds:](#)

6.2.4

Farms must not damage nearby lands with salt-laden soils or saline water intrusion.

Producer guidance:

- If signs of a problem are evident, solutions could include constructing drainage canals or planting high growing, salt-resistant grasses around farm.

6.3 Water Use

[For pond production in marine/brackish waters:](#)

6.3.1

Salinization of fresh groundwater or soils must be prevented. Chloride concentrations must be maintained at the natural average salinity of local groundwater.

Producers can prevent degradation of freshwater and soils from salinization or other contamination by:

- Clearly defining mechanisms for preventing salinization, if farming marine species at inland farms.
- Having methods for verifying that salinization is not occurring, if farming marine species at inland farms.
- Evaluate leakages of pond water, effluents, and pond sediments as possible sources of salinization.
- Not siting farms on sandy soils or in places where there is a high likelihood that salt water from ponds will enter agricultural land or freshwater supplies.

- Using seepage reduction measures. For example, shrimp farms located inland may line ponds to prevent seawater from seeping into fresh groundwater supplies.
- Using low salinity water for preventing salinization, provided that farms don't rely on fresh groundwater for salinity control.
- Monitoring freshwater wells located on or near farms annually for Chloride concentrations.

6.3.2

Saline water must not be discharged into bodies of freshwater.

Additional for shrimp:

6.3.3.

Freshwater resources, such as from aquifers, must not be depleted. Use of fresh ground water for salinity control is prohibited.

Section 7: Siting

7.1

Producers must demonstrate that they have legal approval for aquaculture production where their farm is sited.

Producer guidance:

- Present auditor with permits, leases, or concessions required by government.
- Present auditor with up-to-date maps showing the location of all farms. Maps must indicate public and private land and water zones, any points of potential contamination, water flow direction, and show that farms do not exclude local communities from access to public fishing grounds, mangrove areas, or other resources used for hunting and gathering or fishing.

7.2

Farms must be sited appropriately to minimize the risks of disease or parasite transfer to wild aquatic life and ecosystems.

Producer guidance:

- Disease and parasite transfer can occur from escapes. See Section 9 for escape prevention requirements.

Methods of preventing disease and parasite transfer could include:

- Using closed containment systems.
- Not siting farms in areas that contain seasonal aggregations or dense populations of wild fish or other wildlife that are known to be susceptible to diseases or parasites found at the farm.
- Using ecological buffers to separate farms from habitat for threatened or endangered species that are vulnerable to disease or parasites. Work with local experts to determine the appropriate distance for their region.
- Using barriers to physically separate farm stock from natural water bodies.
- Controlling effluent and minimizing the discharge of effluent.

7.3

Ecosystem damage and habitat loss must be prevented. Converting areas of high ecological sensitivity into new sites or new farms, or for expanding current farms, is prohibited. All new sites or new farms must be sited above the average high tide line.

Producer guidance:

- Areas of high ecological sensitivity include coastal wetlands (including mangrove ecosystems), coral reefs, and freshwater bodies with little water exchange.
- Land-based farms should be sited in areas previously developed or formerly used for agriculture, rather than converting sensitive natural areas to farms.
- Farms should not be sited in special areas such as marine protected areas unless an Environmental Impact Assessment is conducted and can demonstrate low risk

of impact and the farm can demonstrate a history of no significant interactions with wildlife.

Additional for shrimp and other coastal farms:

7.4

Whole Foods Market will only source seafood from producers who demonstrate a commitment to “no mangrove or wetland loss.” Producers already farming on land that was converted from wetlands or mangrove forests to farms must restore within five years (by July 1, 2013) at least a hectare of new habitat for each hectare of wetland or mangrove forest converted to ponds (i.e. a 1:1 ratio). Otherwise, Whole Foods Market’s preference is to source from farms that are sited in non-wetland or non-mangrove locations.

Producer guidance restoration plan:

- Restore the diversity of natural mangrove species rather than mono-culture planting.
- Consider local hydrology (e.g. depth, duration, and frequency of tidal flooding).
- Consider possibility of fallowing farm sites to allow recovery of natural vegetation and biodiversity when appropriate.

7.5

Land-based farms must be sited and constructed in such a way that local hydrology—surface and groundwater bodies—is not disturbed.

Section 8: Escape Prevention

For net pens/net cages:

8.1

Producers must have methods in place to prevent escapes of farmed fish into the surrounding environment from hatcheries and grow-out farms, with the goal of no escapes. Methods must be described in a site-specific Escape Prevention Plan, or Containment Management System (CMS). The plan should include, but is not limited to the following:

- Protocols for safely removing dead, sick, or wounded fish
- Methods for preparing for and responding to storms and other emergencies
- Protocols and schedules for regular inspection of containment systems
- Protocols for preventing and responding to predator attacks if predators are present in the area (see section 10 for acceptable predator control methods)
- Procedures for responding to escapes should they occur
- Methods for preventing escapes from occurring at Critical Control Points (CCP)—the points at which fish are most likely to escape. Include a list of CCPs.
- Protocols for security and surveillance to prevent vandalism
- Methods for controlling nets before transferring fish to pens
- Protocols for maintenance of all equipment and containment systems, such as net integrity and cleanliness, and structural integrity of mooring and cage supports.
- Protocols for operating boats safely around pens/cages

Producer guidance:

- Refer to available information for preventing escapes from net pens used for farmed salmon, including Norway’s NYTEK Regulations, the U.S. State of Maine’s requirements for CMS’s and the North Atlantic Salmon Conservation Organization’s (NASCO) Guidelines on Containment of Farmed Salmon CNL (01)53.
- Escape Prevention Methods can include using closed, re-circulating production systems.

Requirement for finfish raised in net pens/net cages and preferred for other finfish:

8.2

Producers must work to achieve greater accuracy in counting fish to justify estimates of escapes (including estimates of zero escapes). Producers must have a system in place for counting the number of fish brought from the hatchery to pens/tanks for grow-out, mortalities, and numbers of fish graded, harvested and processed. Producers must document the level of accuracy achieved by their counting system and demonstrate improvement over time. Whole Foods Market’s goal is for producers to attain an accuracy level of 99%.

Producer guidance:

- Collaborate with hatcheries to evaluate the counting methods used, assess the accuracy of the methods, and identify critical control points for which there are opportunities to improve accuracy.
- Discuss this standard with manufacturers of counting software and collaborate on opportunities for achieving greater accuracy.

For pond/tank/raceway systems:

8.3

Producers must screen effluent from both farms and hatcheries to prevent escapes into local water bodies. In cases where fish reproduce in ponds, multiple screens may be necessary to prevent escapes of fry.

Section 9: Predator Control

9.1

Exclusion of wildlife predators or other non-lethal methods must be the first level of defense.

Producer guidance:

Non-lethal methods may include:

- Top nets to prevent bird predators from reaching fish, with special attention to preventing entanglement or trapping of birds.
- Bird scaring techniques (e.g. bangers, screamers, propane cannons).

Additional producer guidance:

- Wildlife includes birds, aquatic and terrestrial mammals, reptiles, and amphibians.
- When establishing new ponds, or re-building ponds, consider reconfigurations such as smaller ponds to facilitate the use of exclusion methods.

9.2

Lethal means of predator control can only be employed if non-lethal means have been ineffective. Producers must report the non-lethal methods that were attempted and the reasons they failed. Lead shot is prohibited.

Producer guidance:

- Examples of lethal methods include shooting predators on the farm and oiling or destroying bird nests to prevent hatching.

9.3

Lethal means of predator control must target the offending animal(s) only.

9.4

Intentionally killing predators listed nationally or globally as vulnerable, endangered, or critically endangered (e.g. by IUCN) is prohibited.

9.5

Predator control methods must not cause wildlife to suffer. Lethal means of predator control should result in immediate death.

[Additional for net pens/net cages:](#)

9.6

If predators are present in the area, either as residents or as a migratory population, predator nets (e.g. secondary nets for marine mammals and/or top nets for birds) are required. Predator nets must be maintained to ensure that no holes or tears are present.

9.7

Acoustic Harassment devices (AHDs) are prohibited.

Producer guidance:

- Acoustic Harassment devices are also referred to as Acoustic Deterrent Devices, (ADDs), “pingers,” or seal scarers.
- This requirement will be enforced six months after implementation of these standards.

Section 10: Traceability

10.1

Farm and processing facilities must have the ability to withdraw their products from the market quickly if they are shown to be a health risk. To demonstrate this ability, producers must have a documented recall program that is tested annually at a minimum.

10.2.

Producers must have a tracking system to ensure the identity and history of all fish sold to Whole Foods Market from hatchery to market.

Producer guidance:

- This requirement will be enforced six months after implementation of these standards.
- The production diary should include the following:
 - Source of the fry/smolts/post-larvae, including hatchery name, and tank or batch number
 - Specific ponds/tanks/cages/pens where fish were grown
 - Amount and type of feed used (lot number and name of feed manufacturer)
 - Stocking density
 - Mortalities of fish
 - Date of stocking, including any stock movement
 - Use of any therapeutic drugs or treatments (antibiotics, etc)
 - Use of any chemicals (pesticides, herbicides, etc)
 - Date of harvest
 - Name and location of processing plant

Appendix A. Sampling and Testing Methods for Environmental Contaminants

Producers must follow the following steps.

I. Sampling Method

1. Sample fish for contaminants testing on an annual basis. Each farm must participate in the testing program described above, unless farms are located closely together and are sourcing the exact same feed.
2. Identify three ponds/tanks/raceways/pens from which fish will be harvested during that period and collect a sample from each pond. Samples are comprised of at least three individual animals, creating a total of nine fish to be submitted for laboratory testing each period. The total weight of the sample must be a minimum of 250 grams. If the total sample does not weigh at least 250 grams, add additional animals to reach this minimum amount.
3. Select fish for sampling that have reached a size suitable for harvest.
4. Select fish for sampling that are of average size compared to others in the ponds/tanks/raceways/pens.
5. Wrapping:
 - a. Finfish: Wrap each fish in a sample individually, whole and gutted, and pack with the other fish of that composite to send to the laboratory.
 - b. Shrimp: Wrap all animals in the sample together. If frozen, put shrimp in a jar so that when they are defrosted in the laboratory, the liquid can be used for analysis.
6. Require laboratories to use the testing methods specified below and to follow the Quality Assurance rules associated with each method.

II. Testing Method

1. Prior to conducting chemical analysis, laboratories should do the following:
 - a. Finfish: fillet each whole fish and then homogenize whole fillets from each fish. Fillets must include both the belly flap and the skin unless the fillets are sold to Whole Foods Market skinless (e.g. catfish). A sub-sample of the homogenate can then be taken for analysis.
 - b. Shrimp: De-head and peel each shrimp. Vein should be left in. A sub-sample of the homogenate can then be taken for analysis.
2. Test results must be based on wet weight, rather than lipid weight.
3. All testing for environmental contaminants must be conducted by third party, independent laboratories. Laboratories should be accredited for the tests they are performing to ISO 17025 or the U.S. National Environmental Laboratory Accreditation Program (NELAP) standards. Actual laboratory results should be Submitted to Whole Foods Market as soon as they're available. Whole Foods Market also has the right to request additional testing.

4. Whole Foods Market requires that producers have fish tested for Polychlorinated Biphenyls (PCBs) and submit results to Whole Foods Market. Laboratories should analyze samples for all 209 congeners. Laboratories should use the High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS) method for analysis (EPA Method 1668A).

5. Producers must have fish tested for polychlorinated dibenzo-*p*-dioxins (PCDDs) and polychlorinated dibenzo-*p*-furans (PCDFs), which includes the twelve dioxin-like PCBs listed below* and submit results to Whole Foods Market. Laboratories should analyze dioxin, furan, and PCB congeners that have WHO Toxic Equivalency Factors (TEFs) (see list below**) and report results in WHO-TEQs. If any compound is not detected, WHO-TEQs should be reported as 0.5 of the Detection Limit (ND=0.5DL). Laboratories should use EPA Method 1613b.

**Dioxins (PCDDs) and Furans (PCDFs) Required for Testing	*Dioxin-like PCBs Required for Testing
<u>Dioxins:</u>	77
2,3,7,8-TCDD	81
1,2,3,7,8 -PeCDD	105
1,2,3,4,7,8-HxCDD	114
1,2,3,6,7,8-HxCDD	118
1,2,3,7,8,9-HxCDD	123
1,2,3,4,6,7,8-HpCDD	126
OCDD	156
<u>Furans:</u>	157
2,3,7,8-TCDF	167
1,2,3,7,8-PeCDF	169
2,3,4,7,8-PeCDF	189
1,2,3,4,7,8-HxCDF	
1,2,3,6,7,8-HxCDF	
1,2,3,7,8,9-HxCDF	
2,3,4,6,7,8-HxCDF	
1,2,3,4,6,7,8-HpCDF	
1,2,3,4,7,8,9-HpCDF	
OCDF	

6. Producers must have fish tested for mercury and submit results to Whole Foods Market. Laboratories should analyze fish samples for “total mercury” using the Cold Vapor Atomic Fluorescence method (EPA Method 1631; may be referenced as 1631 Appendix). Results should be reported in mg/kg or parts per million (ppm).