

Whole Foods Market

Quality Standards for Farmed Seafood: Salmon, Other Finfish, and Shrimp

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Introduction

Whole Foods Market (WFM) is pleased to present our updated Quality Standards for Farmed Seafood: Farmed Salmon, Other Finfish and Shrimp. 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 individual producers or producer groups operating worldwide and cover all methods of production. While previous versions of WFM Seafood Quality Standards addressed farmed salmon and other species of finfish and shrimp in two separate documents, in this version we have merged the two. Standards related to specific species or specific production methods are further detailed in the document.

These standards are farm-level, meaning they specify our requirements and expectations for production on the farm. Hatcheries will not be audited under these standards, even if the hatchery is located near the farm. If producers are using nurseries, the nurseries must be audited.

While third-party audits are focused on farms, we still expect that producers will source stock from hatcheries that do not use prohibited substances as outlined in standard 2.2. In addition, producers should minimize stress to fish during harvesting, transport, and slaughter. For example, during transport, oxygen levels should be monitored and maintained at an adequate level and transport time should be limited. Fish should also be slaughtered in the most humane way possible. Mechanical or electrical stunning systems are preferred and should be monitored to ensure effectiveness. Furthermore, producers must maintain the highest standards for quality and food safety of seafood products. However, this will not be verified through the Quality Standards audit process. Suppliers should continue to obtain any relevant certifications such as HACCP and BRC to verify health and safety conditions at processing plants. We also expect that no preservatives will be applied to seafood products and that all local, state, and federal requirements for packing dates/shelf life, transport, and temperature controls will be followed.

Please note that these standards are designed for *individual* farms that sell fish and shrimp to Whole Foods Market and therefore are feasible for an *individual* producer to meet. Group certification may be an option for some suppliers. Producers interested in becoming certified as a group should review the general overview guidelines for group certification in Appendix B and then inquire directly with the Certification Body to receive a more detailed guide and determine if they meet the necessary criteria for group certification.

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 potential environmental impacts 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 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.

Whole Foods Market “Responsibly Farmed” Logo

The Whole Foods Market® “Responsibly Farmed” logo helps customers recognize our commitment to offering farmed seafood that has been third-party verified to meet our Quality Standards for Farmed Seafood. Suppliers interested in using this logo must receive permission from Whole Foods Market and follow our style guidelines. These logo guidelines are for both product packaging and for in-store use. Only products that meet the Quality Standards for Farmed Seafood and have been third-party verified by our approved Certification Body can display the logo. For information about the logo, including logo guidelines, please contact David Pilat: david.pilat@wholefoods.com.

Terminology

<u>CB:</u>	Certification Body
<u>Farm:</u>	Facility, including ponds, raceways, tanks or net cages, for the production of grow-out fish. Normally, this facility covers the major grow-out phase of fish prior to harvest.
<u>Fish:</u>	All species of finfish and shrimp.
<u>Grow-out fish:</u>	All fish intended for human consumption, including post-larvae, fry, smolts and fingerlings.
<u>Hatchery:</u>	Facility for hatching eggs and producing larval-stage animals under controlled conditions. In this document, the term hatchery includes facilities for holding broodstock used for egg production, egg hatching, and larval production. Larvae are defined as newly hatched animals that are transitioning to look like the adult version of itself. Yolk-sac stage in fish and metamorphosing newborn shrimp are examples of larvae.
<u>Must:</u>	Required action on part of producer
<u>Nursery:</u>	Facility for supporting post-larvae or fry development. Nurseries often are where animals are transitioned from starter feeds to grow-out feeds. They may also be used to produce advanced size fingerlings. Animals may spend a relatively minor amount of their time in nurseries and are eventually moved to grow-out facilities.
<u>Operator Profile (OP):</u>	Documents producer’s practices to ensure compliance with Whole Foods Market Quality Standards for Farmed Seafood. (Formerly called “Application/Farmed Seafood Verification Statement”)
<u>Producer:</u>	Operator of farm.
<u>Producer guidance:</u>	Defines a term in the standards, provides further clarification, or offers suggestions on methods that could be used to meet the standards.
<u>Production Unit:</u>	Hatchery, farm, or processing plant
<u>Should:</u>	A practice that is highly recommended.
<u>WFM:</u>	Whole Foods Market

Definition of Aquaculture:

For the purposes of the current standards, we define aquaculture as follows:

The farming of aquatic organisms whereby growers **enhance** production by **maintaining** and **managing** cultured stocks in a defined area. To qualify as a farmed product (i.e., not wild-caught), ALL of the following conditions must be met:

- Growers regularly add seed/eggs/post-larvae/fry/smolts to the farm. For finfish (including salmon) and shrimp, they must originate from a hatchery. AND;
- Growers have control of—either through ownership or leases—the area where they are farming. Harvesting animals in areas open to the public does *not* qualify as aquaculture and will be considered a wild-capture fishery. AND;
- Animals do not have to receive any added feed to be considered “farmed.”

Scope of the standards: These standards apply to the following species, but can also cover other finfish and shrimp species as well. Quality Standards for farmed bivalve molluscs are covered in a separate document.

- Atlantic salmon (*Salmo salar*)
- 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*)
- Barramundi (*Lates calcarifer*)
- Pompano (*Trachinotus blochii*)
- Redfish/red drum (*Sciaenops ocellatus*)
- Yellowfin (*Seriola rivoliana*)
- Pirarucu / Paiche (*Arapaima gigas*)
- Tambaqui (*Colossoma macropomum*)

Guiding documents for the implementation of this standard

The following documents can be requested from Whole Foods Market:

- WFM Operator Profile
- Feed Manufacturer Compliance Statement
- Calculations for Whole Foods Market (request calculations spreadsheet from Certification Body)

Summary Table of Key Metrics

NOTE: Not all standards are included in table below.

Ref. #	Metric	Date for Compliance
2.1	No genetically modified or cloned animals	immediate
2.2	No methyl testosterone permitted on trout broodstock	September 1, 2014
2.5	Grow-out fish must be hatchery-raised	immediate
3.1	No antibiotics on grow-out fish 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
3.2	No parasiticide treatments allowed	--immediate for salmon --other finfish/shrimp: Prohibited after July 1, 2013. 1 parasiticide bath treatment allowed per life-cycle until July 1, 2013.
2.2, 4.5, 4.6	No antibiotics, parasiticides, hormones or slaughterhouse products from avian or mammalian species permitted in feed.	immediate
4.8	Annual reporting on progress toward meeting Maximum Fish In, Fish Out ratios	yearly reporting
4.13	No synthetic pigment sources allowed in feed	immediate
5.1	Annual testing for assessing progress toward meeting maximum	Annual; results available to auditors by October 31 each

	<p>contaminant levels:</p> <p>-PCBs: 0.011 ppm (11 ppb or 11 µg/kg)</p> <p>-WHO-TEQs (dioxins, furans, dioxin-like PCBs): 2.16 ppt (parts per trillion) or 2.16 pg/g or ng/kg</p> <p>-Mercury: 0.22 ppm or 0.22 mg/kg</p>	<p>year. (must be done <i>either</i> by farm or processing facilities, not by both)</p>
6.1.4	No nets/cages treated with copper-based antifoulants or other toxic antifoulants	July 1, 2014
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, 6.3.2	Salinization of surrounding areas 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 Containment Management System specifying all protocols for preventing escapes	immediate
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	immediate
10.1	Tracking system to ensure the identity and history of all fish sold to Whole Foods Market from farm to market required	immediate

Section 1: General Requirements

1.1 Compliance with Government Regulations

Producers must comply with all local, state, and national laws, codes, and regulations governing operations, including, but not limited to those categories listed below. Producers must inform Whole Foods Market, in the form of a written letter, of any major violations to government laws and regulations and specify corrective actions that will be taken. A copy of the letter must be included in the Operator Profile and shown to the Certification Body (CB) during the audit.

- Human health and safety
- Labor and employment
- Production siting and land use zoning
- License requirements
- 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
- Local community involvement
- Payment of fees and taxes

1.2 Operator Profile

Each producer must complete an Operator Profile (OP), which identifies practices implemented to ensure compliance with all applicable sections of Whole Foods Market Quality standards for Farmed Salmon, Finfish and Shrimp. The OP must meet the following requirements:

- One Operator Profile must be completed for each species raised. If a producer is raising more than one species, a separate document must be completed for each species.
- An updated version must be submitted annually to the Certification Body (CB), at least 1 month prior to the audit.
- It must be current at all times. If there are any changes in production practices, producers must update the document and re-submit to the CB within one month.
- 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 OP and refer to the relevant section within the OP.

1.3 Audits

All documentation, records, and production units are subject to annual inspection by an independent Certification Body, selected by Whole Foods Market. These third party audits must be paid for by suppliers.

Producer guidance:

- Producers are reminded that it's their responsibility to learn and understand the standards and comply with all components of the program. Producers should proactively reach out to Whole Foods Market with any questions about the standards and work continuously to implement the standards on their farms, including any necessary corrective actions. The role of the CB is to verify compliance and issue certifications to qualified producers, rather than to serve as a trainer of the standards.

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 Quality Standards for Farmed Seafood. Records must be signed by farm owners as accurate. Inaccurate reporting could lead to suspension of business with Whole Foods Market. Records may be held in a range of formats, including computer programs, and hard copy files, but must be accessible during audits. The records requested will include 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.
- Methods/protocols taken to prevent spread of disease
- Dates of health checks conducted on grow-out stock
- 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)

Completed feed compliance form detailing:

- 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 Water Quality and Pollution Prevention

- Percentage of nets that are treated with antifoulants
- Nutrient Management/Effluent--For producers using feed OR fertilizer:

Calculate total annual inputs of nutrients:

- 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)

Measure discharges of effluent:

- 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
- Record total annual farm discharge, m³/year (amount of water discharged from farm annually).
- Calculate load of variable using the spreadsheet “Calculations for Whole Foods Market.” Note: formulas are specific to production system.
- Seafloor Monitoring:
 - Results of seafloor monitoring (e.g. video surveys) to confirm that unconsumed feed is not accumulating beneath or adjacent to net pens or cages.
 - Results of sediment sampling for Redox potential levels or sulfide levels.

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 in the event of an emergency. Procedures must be posted in a prominent location so they are readily available in an emergency.

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 on the present standards must be provided by the producers to all farm employees. It is the responsibility of the producers to ensure that the requirements of these standards are understood by all individuals handling products sold to Whole Foods Market.

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 at 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: Source of Grow-Out Stock

2.1.

Use of genetically modified or cloned animals is prohibited. Producers must indicate in their Whole Foods Market Hatchery and Nursery Practices Verification Statement (submitted along with their Operator Profile) whether or not the fish are genetically modified or cloned.

Producer guidance:

- Selective breeding is not considered genetic modification.
- Genetically engineered (GE) crops or animals are also known as genetically modified organisms, or GMOs.

2.2 Prohibited Substances at Hatcheries and Nurseries

Producers are responsible for ensuring that the hatcheries and nurseries from which they source larvae, post-larvae, fry, smolts, fingerlings and grow-out stock do not use prohibited substances on fish or feed sold to farms supplying Whole Foods Market. Prohibited substances include antibiotics, growth hormones, preservatives, methyl testosterone (according to applicable standards), in-feed parasiticides, malachite green, crystal violet, Tributyltin compounds, organophosphates, and slaughterhouse products from avian or mammalian species in feed. Producers must submit a Whole Foods Market Hatchery and Nursery Practices Verification Statement filled out and signed by each hatchery and nursery they source from, indicating that these prohibited substances are not used. The statement must be sent to the Certification Body along with their Operator Profile. Verification statements must also be kept on file at the farm for review by the Certification Body.

Additional for trout:

Producers must source eggs raised from broodstock without the use of methyl testosterone by September 14, 2014.

2.3

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

To avoid introducing and spreading pathogens to shrimp farms, producers should stock post-larvae from Specific Pathogen Free (SPF) and/or Specific Pathogen Resistant (SPR) shrimp broodstock. If certified SPF or SPR shrimp are not suitable to local conditions, producers must use shrimp bred for pathogen resistance. The Whole Foods Market Hatchery Practices Verification Statement must indicate which method of pathogen prevention is used.

Producer guidance for shrimp:

- Domesticated 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.
- Domesticated SPR broodstock are defined as those animals that are resistant to a specific pathogen.
- 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), 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.

2.4

Raising native species is preferred. 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).

2.5

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.

Section 3: Drug and Synthetic Chemical Use

3.1

The Following Drugs and Synthetic Chemicals are prohibited:

Prohibited	Producer Guidance
Preservatives	<ul style="list-style-type: none"> Prohibited preservatives 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	<ul style="list-style-type: none"> This includes larvae, post-larvae, fry, smolts, fingerlings and grow-out stock. 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.
Growth hormones on grow-out fish	
Methyl testosterone on grow-out fish	For sex reversal
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	<ul style="list-style-type: none"> Organophosphates are highly toxic chemicals used in some pesticides

3.2 Synthetic parasiticides

Farmed Salmon:

Synthetic parasiticides are not permitted.

Other finfish/shrimp:

Use of synthetic parasiticides is not allowed after July 1, 2013. Prior to this date, a maximum of 1 bath treatment per grow-out cycle is allowed and only when approved by a veterinarian. Parasiticides must not be administered prophylactically.

Producer guidance:

- In 2007 (for farmed salmon) and 2008 (other finfish and shrimp), Whole Foods Market implemented a five-year phase out period for use of synthetic parasiticides on fish destined for Whole Foods Market stores.
- Alternatives to synthetic chemical treatments could include using vaccines, cleanerfish, mechanical solutions, sea lice traps, or other innovative solutions.
- Wrasse (cleaner fish) may be used to prevent infestations of sea lice. If wild-caught wrasse are used, catch levels must not cause wrasse populations to become overfished. If wrasse are non-native to the region where the farms are located, 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.
- Use of hydrogen peroxide as a parasiticide is permitted.
- Beyond the phase-out period, if preventative methods fail and fish must be treated with synthetic parasiticides, those fish cannot be sold to Whole Foods Market.

3.3

Injured fish or seriously ill fish that appear unlikely to recover must be promptly and humanely euthanized.

3.4

Additional for salmon raised in net pens/cages:

To avoid causing stress, injury, or illness to confined animals and to reduce the overall environmental impacts of production, stocking densities (calculated as total biomass/total volume of pen) in open net pens must not exceed 20 kg per cubic meter. Closed containment facilities may operate at higher densities if evidence of low stress to fish can be provided.

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

A current Feed Manufacturer Compliance Statement for each feed type used during nursery and grow-out stages of production, including labels for each, must be submitted at least 1 month prior to the audit. The CB must be informed of any change of feed by the re-submission of a Feed Manufacturer Compliance Statement and attached labels.

Producer guidance:

- Any feed for which ingredients, or amounts of certain ingredients, vary are considered different feed types. If only pellet size varies, this does not need to be considered as different feed type.

4.2

All feed must comply with regulations of the U.S. Food and Drug Administration (FDA) or equivalent.

4.3

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

4.4

Feed must not be adulterated.

4.5

Antibiotics, parasiticides and hormones are prohibited in feed.

4.6

Slaughterhouse products from avian or mammalian species are prohibited in feed. If the Certification Body (CB) suspects that feed contains slaughterhouse products, they will collect a feed sample from the farm and submit it for laboratory testing. Suppliers are required to permit auditors to collect the sample. Sampling will be done at the producer's expense.

Producers whose feed tests at or above 1000 ppm will be suspended or denied approved status as suppliers.

Producer guidance:

- The threshold for the level of slaughterhouse products in feed is 1% or 1000 ppm. This number represents a reasonable limit for distinguishing intentional use from accidental cross contamination. Below 1000 ppm, but above the detection limit of 25 ppm indicates likely cross contamination of equipment and would not require action.
- The estimated cost of testing is \$275.00 per sample. Testing is conducted by Genetic ID.

4.7

Feed must be fully processed to kill microorganisms, reduce the risk of disease transmission, and maintain its integrity in the water for optimal efficiency.

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.

4.8

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 Fish In, Fish Out Ratio, as indicated below. To evaluate progress towards meeting this goal, producers must report their ratios yearly. Ratios must be calculated using the spreadsheet “Calculations for Whole Foods Market.” Whole Foods Market will review these reports to evaluate progress.

To calculate the ratio, use data from the farm diary, not from theoretical production and FCR values.

Target Level for Fish In, Fish Out Ratio:

- **Shrimp (*Litopenaeus vannamei*): 1:1**
- **Black tiger shrimp (*Penaeus monodon*): 1.5:1**
- **Cod: 1:1**
- **Salmon 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 the Certification Body (CB) for the spreadsheet, “Calculations for Whole Foods Market,” 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.

4.9

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.

4.10

Use of “trash fish” in feed is prohibited.

Producer guidance:

- “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.

4.11

If producers are raising fish for customers other than Whole Foods Market, and the feed for other customers does not meet Whole Foods Market’s standards, mechanisms must be in place to prevent co-mingling of products, including feed.

4.12

Producers claiming to use non-GMO ingredients must have acceptable verification through organic certification or a certification program using accredited testing technology and scientific documentation of quality assurance.

Producer guidance:

- Genetically engineered (GE) crops are also known as genetically modified organisms, or GMOs.

4.13

[Additional for species receiving feed with added pigment \(e.g. Atlantic salmon, steelhead/rainbow trout, Arctic char, and shrimp\):](#)

Pigment in grow-out feed, including astaxanthin/canthaxanthin, must be from a non-synthetic source. This standard applies to pigment used for coloration, stress tolerance, and antioxidants.

Producer guidance:

- As a by-product from processing, shrimp shells are permitted for use as pigment.
- Pigment from *Phaffia* yeast is permitted.

- Pigment the bacterium *Paracoccus carotinifaciens* is permitted.
- Producers must obtain approval from WFM to use other types of colorants

4.14

Additional for salmon:

To ensure that farmed salmon sold to Whole Foods Market provides enough beneficial omega 3 fatty acids, all farmed salmon must contain at least 1,820 mg of combined EPA and DHA per eight ounce piece of uncooked salmon (227 g).

Producer guidance:

- This requirement follows the high end of the U.S. National Academy of Science Institute of Medicine’s recommended range for weekly allowance of EPA and DHA (omega 3 fatty acids).

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.

Tests for environmental contaminants must be completed and results must be made available to auditors by October 31 of each year. Samples must be submitted by either farm or processing facilities, not by both.

Contaminant group	Maximum Level		Method
PCBs	0.011 ppm (11 ppb)	11µg/kg	EPA 1668 A
WHO-TEQs (dioxins, furans, dioxin-like PCBs)	2.16 ppt (parts per trillion)	2.16 pg/g or ng/kg	EPA 1668 A EPA 1613B
Mercury	0.22 ppm	0.22 mg/kg	EPA 1631 (or other methods listed in Appendix A.)

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).

- See Appendix A: Required Sampling and Testing Methods

Section 6: Water Quality and Pollution Prevention

6.1 Inputs

6.1.1

Disinfectants for cleaning must be safe and used in concentrations that are non-toxic to fish and aquatic systems. Any disinfectants used must be approved for use by the U.S. Food and Drug Administration (FDA), the U.S. Environmental Protection Agency (EPA), The U.S. Department of Agriculture (USDA), or the World Organization for Animal Health (OIE). Producers operating in countries outside the United States may alternatively refer to national guidelines for safe disinfectant use. 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.

6.1.3

Additional for ponds:

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

6.1.4

Additional for net pens/cages:

Whole Foods Market's intent is to purchase all fish from farms that use un-treated nets. As of July 1, 2014, net pens/cages or net structures treated with copper-based antifouling agents (e.g. paints), or other toxic antifoulant products, will be prohibited.

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 and causing organic enrichment of

benthic sediments. Sediment sampling, as specified in Standard 6.2.4, is sufficient for monitoring for organic enrichment.

6.2 Nutrient Management/Effluent

6.2.1

For ALL Producers using feed OR fertilizer:

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

6.2.2

For ALL Producers using feed OR fertilizer:

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 must 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.

Requirements for effluent monitoring:

- 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 using the Excel Spreadsheet, Calculations for Whole Foods Market, provided by the Certification Body (CB)
 - **Net pens/cages:** Use Calculation Version 1
 - **Watershed ponds and reuse systems:** Use Calculation Version 2
 - **Raceways or ponds with water exchange:** Use Calculation Version 3

Producer guidance for reducing environmental impacts:

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

Unconsumed feed must not accumulate on the seafloor beneath or adjacent to net pens or cages. Producers must have a system for monitoring the feeding process with a mechanism in place to control excess feeding. Producers must be able to confirm with data that unconsumed feed is not accumulating under cages.

Producer guidance:

- Video surveys of seafloor may be used to evaluate presence or absence of unconsumed feed.

6.2.4

Additional for net pens/net cages in marine systems:

Under or within 30 meters of net pens, sediment samples from soft bottom benthic environments (mud, sand, or shell) must have Redox potential levels greater than -100 mV nhe, or sulfide levels below 1300 micromoles prior to stocking fish.

Producer guidance:

- Take sediment samples and measurements in a manner that prevents contamination of samples from oxygen in water or air.

6.2.5

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:

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

6.2.6

Additional for shrimp and other species raised in saline ponds:

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

6.3.1

For pond production in marine/brackish waters:

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

Producer guidance:

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.

6.3.3

Additional for shrimp:

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.

7.4

Additional for shrimp and species on coastal farms:

Whole Foods Market will only source seafood from producers who demonstrate a commitment to “no mangrove or wetland loss.” Whole Foods Market will not source from farms that were converted from wetlands or mangrove forests to aquaculture operations after 1980 (either by their own company or a previous owner), unless the farm completes the requirements for mangrove or wetland restoration by July 1, 2013, as specified in the producer guidance below. Any suppliers entering the program after July 2013 must show that either they did not convert wetlands/mangroves, or that if they did, full restoration was completed by July 2013.

Producer guidance:

- In 2008, when the Whole Foods Market Quality Standards for Finfish and Shrimp were released, we provided a five-year time period for restoration of mangroves for producers that were farming on land that had been converted to shrimp farms or other type of aquaculture. This allowance ends July 1, 2013. By this date, suppliers must complete restoration in order to sell fish to Whole Foods Market from such farms. Restoration requirements stated that at least a hectare of new habitat must be restored for each hectare of wetland or mangrove forest converted to ponds (i.e. a 1:1 ratio).
- Restore the diversity of natural mangrove species rather than use 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.

7.6

Additional for net pens/cages:

Farms must be sited in areas with suitable environmental characteristics, including current speed, water depth, and flushing action.

7.7

Additional for salmon raised in net pens/cages:

Farms must be sited at adequate distances from areas known to be important for wild salmon populations such as the mouths of salmon rivers.

Producer guidance:

- Maintaining adequate distance from the mouths of salmon rivers helps to protect wild salmon populations by minimizing interaction between farm stock and wild smolts, including the spread of sea lice.
- Producers should work with local experts to determine the appropriate distance for their region.

7.8

Farms must be sited at adequate distances from other salmon farms to avoid parasite and disease transfer. Farms with a history of recurring disease or parasite problems due the proximity of neighboring farms may not be approved to sell fish to Whole Foods Market.

Section 8: Escape Prevention

8.1

Additional for net pens/net cages:

Whole Foods Market will source farmed fish from producers that can demonstrate exceptional effort in preventing escapes, with the goal of working to as close to zero escapes as possible. Producers must have a site-specific Containment Management System (CMS) for preventing escapes (including “leakage”) of farmed fish into open water. Routines and protocols specified in the CMS are subject to announced and unannounced audits by the Certification Body (CB). The System should include, but is not limited to the following:

- Protocols for safely removing dead, sick, or wounded fish
- Exact counting of all dead 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 9 for acceptable predator control methods)
- Procedures for responding to escapes should they occur
- List of Critical Control Points (CCP)—the points at which fish are most likely to escape—and proactive measures to prevent escapes from occurring at the CCPs
- Protocols for security and surveillance to prevent vandalism
- Methods for controlling nets before transferring fish to pens
- Size and grading specifications for fish prior to transferring to pens
- Mesh size requirements relative to fish size
- 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.

8.2

In addition to meeting the requirements for reporting escapes or leakages to local, regional, or federal agencies, producers must keep records of any escape incidents and make records available to the Certification Body (CB) during audits. Producers must also inform Whole Foods Market in writing within 24 hours of any escapes involving over 50 fish. Notices sent to WFM must also be kept on file at the farm for review by the Certification Body.

8.3

[Additional for pond/tank/raceway systems:](#)

Producers must use physical barriers, such as screens, filters, or size-appropriate grids in areas where effluent leaves the farm to prevent fish from escaping into local water bodies. In cases where fish reproduce in ponds, multiple screens or barriers may be necessary to prevent escapes.

Section 9: Predator Control

9.1

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

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 and bird scaring techniques such as e.g. bangers, screamers and propane cannons.
- Examples of lethal methods include shooting predators on the farm and oiling or destroying bird nests to prevent hatching.
- An example of a situation where lethal means are necessary is where a predator is entangled or injured and cannot be removed safely. 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

Lead shot is prohibited for both scaring and killing predators.

Producer guidance:

- This standard is intended to prevent toxic lead from entering the environment and harming birds and other wildlife.

9.3

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

9.4

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

9.5

Producers must report incidental takes of avian, terrestrial, or mammalian predators (e.g. drownings or entanglements in predator nets) to Whole Foods Market. Details on the number of deaths, injuries, and the species affected must be documented in both the Operator Profile as well as the producer's records, which are subject to audit. Deaths of protected or endangered species must be immediately reported to Whole Foods Market in writing. Notices sent to WFM must also be kept on file at the farm for review by the Certification Body.

9.6

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

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.

Section 10: Traceability

10.1

Producers must have a tracking system to ensure the identity and history of all fish sold to Whole Foods Market from point of arrival on the farm to point of sale to the processor.

The tracking system must 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**

Contaminant group	Maximum Level		Method
PCBs	0.011 ppm (11 ppb)	11µg/kg	EPA 1668 A*
WHO-TEQs (dioxins, furans, dioxin-like PCBs)	2.16 ppt (parts per trillion)	2.16 pg/g or ng/kg	EPA 1668 A EPA 1613B
Mercury	0.22 ppm	0.22 mg/kg	EPA 1631**

Producers must follow the following steps.

I. Sampling Method

1. Sample fish for environmental contaminants testing on an annual basis.
2. Submit a sampling plan to the CB annually by March 1. The plan must include the following information:
 - Sampling date
 - Expected date of receipt of results
 - Lab to be used
 - Number of farms from which samples will be taken
 - Number of ponds/tanks/raceways/pens from which samples will be taken
 - Reason for reduced sampling program, if applicable (see #3 below), with details demonstrating that the criteria for the reduced sampling are being met
3. Producers must collect samples from each farm/site unless they qualify for a reduced sampling program. Companies with several farms may be eligible to implement a reduced sampling program, whereby samples are collected from only one farm. Any company that wishes to carry out a reduced sampling program must submit their request to the CB for approval in their annual sampling plan (see #2 above). The sampling plan must include details of the farms to be tested. The criteria for reduced sampling are that all farms:
 - Are under the same management
 - Use the same feed
 - Source water from the same water body

Producer guidance:

- A “farm” or a “site” refers to a cluster of ponds, tanks, raceways and pens that are relatively close together, managed by the same staff, and typically tended to at the same time, or within a very short period of time.
4. Collect one fish from each of several ponds/tanks/raceways/pens. Several are defined as 10% of the total number of ponds/tanks/raceways/pens at the farm site. The minimum number of animals to be collected is three.

Producer guidance:

- Example 1: If a farm has 25 ponds, then the number of ponds from which fish should be sampled is 3 (10% of 25 = 2.5, round number up to 3). Collect one fish from each of the three ponds, for a total of 3 fish and combine into a single sample to submit for analysis.
- Example 2: If a farm has 56 ponds, then the number of ponds from which fish should be sampled is 6 (10% of 56 = 5.6, round number up to 6). Collect one fish from each of the six ponds, for a total of 6 fish and combine into a single sample to submit for analysis.

5. 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. This requirement applies to all farms, both those participating in a normal sampling program and those participating in a reduced sampling program.

Producer guidance:

- If the total weight of the sample is less than 250 grams, add additional animals from the same ponds that are being sampled. For example, if three ponds are being sampled, take two animals from each pond instead of one to reach the minimum of 250 grams.

6. Select fish for sampling that have reached a size suitable for harvest.

7. Select fish for sampling that are of average size compared to others in the ponds/tanks/raceways/pens.

8. Wrapping:

- a. Finfish: Wrap each fish of a sample individually, whole and gutted, and pack with the other fish of that sample 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.

9. Filleting:

Sending one fillet per fish (in contrast to whole fish) is allowed, but the entire fillet must be sent to the lab, including the belly flap and skin. The fillet size must not be cut down. Prior to preparing fillets, and in between fish, wash and scrub filleting tools with soapy water, and then rinse well to get rid of all soap. In addition, clean and rinse the work surface before use and between fish. Put a fresh piece of heavy duty foil on the surface where fillets are being prepared.

Next individually wrap each complete fillet per fish in two layers of foil and seal in a zipper bag for freezing and shipping to the laboratory. Fillets thaw more easily than whole fish (and can lose fluid) so they must be well frozen before being sent and kept cold on more ice, or on dry ice during shipment. Warm samples may not be possible to analyze.

10. Require laboratories to use the testing methods specified below and to follow the quality assurance rules associated with each method.

II. Testing Methods

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, peel, and homogenize 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 the Control Body (CB) as soon as they're available. Whole Foods Market and the CB have the right to request additional testing.
4. **PCBs:** Whole Foods Market requires that producers have fish tested for Polychlorinated Biphenyls (PCBs). Laboratories should analyze samples for all 209 congeners. Report both the concentration of the 209 individual congeners and total PCBs as represented by the sum of the congeners. Laboratories should use the High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS) method for analysis (*EPA Method 1668A or an equivalent method that provides detection limits of no more than 0.02 µg/kg per congener). Results should be reported in µg/kg or parts per million (ppm).
5. **WHO-TEQs:** Producers must have fish tested for polychlorinated dibenzo-*p*-dioxins (PCDDs) and polychlorinated dibenzo-*p*-furans (PCDFs)(List #1 below), which includes the twelve dioxin-like PCBs (List #2 below). Laboratories should also analyze dioxin, furan, and PCB congeners that have WHO Toxic Equivalency Factors (TEFs) (List 1 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 for dioxins & furans and EPA Method 1668A for dioxin-like PCB's. Results should be reported in pg/g, ng/kg, or parts per trillion (ppt).

1. Dioxins (PCDDs) and Furans (PCDFs) Required for Testing	2. 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. **Mercury:** Producers must have fish tested for total mercury (Hg). Laboratories may use the following methods:
- 1) EPA Method 1631, Appendix, Analysis by Cold Vapor Atomic Fluorescence Spectrometry, with Digestion I (section A11.1)
 - 2) EPA Method 6020, Analysis by ICP-MS, with Digestion Methods 3050B, 3051, 3052
 - 3) EPA Method 245.6, Analysis by Cold Vapor Atomic Absorption (section 11.1 - 11.2) (method specifies digestion method)
 - 4) EPA Method 7471A, Analysis by Cold Vapor Atomic Absorption, with Alternate Digestion Method Section 7.2. (Note: there is evidence that a low bias to the total Hg results may be seen if other digestion methods are used.)

Results should be reported in mg/kg or parts per million (ppm).

III. Results

1. The following must be submitted to the CB by October 31 of each year:
 - Original reports from the laboratory.
 - The results summary provided by the lab should include, but is not limited to, the following:
 - sampling date
 - Species tested

- name of the sampled farm
- date of analysis
- method used
- results for PCBs, WHO-TEQs and mercury given in the required units, as indicated in the standard
- detection limit used for each compound.

2. Producers must record their results in the Operator Profile (OP).

Appendix B.

General Guidelines for Group Certification

Note: These are general, abbreviated guidelines. Producers interested in pursuing group certification must contact the Certification Body for more complete instructions.

Adopted from: Stark and Bocquillet, Swiss Import Promotion Program, Improving Aquaculture Practices in Small Holder Shrimp Farming

Producers interested in pursuing group certification must have or develop the following:

- 1. Internal Control System (ICS):** a documented quality assurance system that allows the external third-party Certification Body (CB) to delegate annual inspection of group members (farms) to a body within the project. The ICS manages compliance with the standards. An effective ICS requires qualified personnel to implement and manage the ICS. For example, the body in charge of the ICS must:
 - Have an **ICS manager** to coordinate the farmers and the project, and be responsible for external communication with the CB.
 - Organize and maintain the **documentation** and verify records kept by farms.
 - Continuously improve, update and distribute as necessary all relevant ICS documentation (e.g. ICS manual).
 - If easier, create a simple **Internal Standard** manual covering all points of the Whole Foods Market standards that are relevant to the specific farms in the group. An internal standard is written by the ICS operator for the specific local situation of the project but covers all applicable certification requirements of the WFM standards. The internal standard must be communicated to the farmers in local language and is part of the ICS manual. If farmers are illiterate, an illustration of the standards may be required.
 - Provide Harvest **Estimation** to the CB.
 - Provide an **Organizational Chart** to the CB.
 - Provide **Training** to all internal ICS staff as well as all group members.
 - Include **Buying Procedures** in the ICS manual and internal inspections in order to maintain traceability.
 - Maintain an **Approved Farmer List (AFL)** that includes all the members of the farmer group that have passed the ICS internal inspection.
 - Assure that buying personal is always provided with a current **Approved Farmer List (AFL)**.

- 2. ICS manual:** The ICS procedures and policies must be documented in an ICS manual. The ICS manual needs to be reviewed on a regular basis and updated when necessary. Changes are communicated to all staff concerned. The CB will review and approve the ICS manual prior to onsite visits. The ICS manual shall describe the project in general and all procedures and policies of the ICS and include all template documentation required. The ICS manual shall reflect the practical application of the ICS and current requirements of the certification standard. The content will include:

- Distribution and management of ICS Manual
- Brief description of structure of the ICS
- Brief description of activities (production, harvest, collection centers, etc.)
- Risk management
- Internal standard
- Farm control and approval procedures
- Organization and ICS personnel (inspectors, field officers, manager, etc.)
- Training
- Buying, Handling, Processing, Export
- Annex: templates of inspection checklists, approval forms, farm diaries etc.

Internal Inspection:

- Internal inspections by the ICS verify the implementation of the standards at the farm level. **ICS trained inspectors** inspect 100% of farms annually prior to the external third-party audit. The ICS manager reviews inspection reports and issues a formal farm “denial,” “approval with conditions,” or “approval without conditions.”
- All members within the group must understand and implement the standard.

External third-party audits:

- The **External third-party Certification Body** annually audits a portion of farms as well as the ICS body to see if the ICS is working. The total number of farms audited by external inspectors is calculated as the square root of the total number of farms. Setting up an ICS generally makes sense for groups with 20 or more farms, but could work for smaller groups.
- The external inspection by the CB verifies that the procedures outlined in the ICS manual are being implemented fully by the ICS manager, inspectors, and farmers and that the Whole Foods Market standards are being met by all farms audited.
- If the ICS is well-managed, it may be possible to reduce the number of farms in the group that are audited by the external CB.