

INTERIM FINAL REPORT
Of the
Aquaculture Working Group
Winter 2006

**U.S. Department of Agriculture
National Organic Program**



The National Organic Program Aquaculture Working Group

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EXECUTIVE SUMMARY

OVERVIEW

The Aquaculture Working Group

In response to the growing interest in the certification of aquatic animals as organic, in 2005, the National Organic Standards Board (NOSB) and National Organic Program (NOP) announced the formation of an aquatic animal task force. This task force was to be comprised of two working groups; aquaculture and wild fisheries.

The aquaculture working group (AWG) is a diverse group of experienced professionals consisting of representatives from universities, trade associations, seafood producers and suppliers, and environmental interests. With the submission of this interim final report, the AWG partially satisfies the objective established by the January 24, 2005, Federal Register notice (FR 70 3356) to develop draft organic production and handling standards for aquatic animals produced in aquaculture. The AWG's discussions were informed by the May 24, 2005 National Organic Aquaculture Working Group (NOAWG) white paper ([insert hyperlink](#)) and the May 30, 2001, NOSB Aquatic Animal Task Force recommendation ([insert hyperlink](#)) on development of organic standards for aquatic animals. The NOAWG is a private sector ad hoc group of approximately 85 individuals interested in advancing organic aquaculture in the United States.

The AWG performed its work through conference calls and email exchanges. Formal public review of this interim final report will occur through the normal NOSB meeting process. This review is expected to be completed during the summer of 2006.

Some substances that are necessary in aquaculture practices may require inclusion on the National List. A separate proposal may be submitted by AWG concerning these substances after further consideration.

The Aquaculture Working Group is considering the adoption of standards for bivalve molluscan shellfish harvested from the ocean. Unfortunately, due to many complexities involved in this issue, the Working Group has yet to develop such a proposal. AWG intends to continue to explore this possibility and may submit a supplemental proposal.

This interim final report proposes amendments to the final rule Subpart A – Definitions and Subpart C – Organic Production and Handling Requirements.

January 13, 2006

§ 205.2 Terms defined

The following definition in § 205.2 shall be amended to read:

Livestock. Any cattle, sheep, goat, swine, poultry, equine animals, or aquatic animals used for food or in the production of food, fiber, feed, or other agricultural-based consumer products; wild or domesticated game; or other nonplant life.

The following definitions shall be added to §205.2 Terms Defined.

Aquaculture. The propagation and rearing of aquatic animals and plants.

Aquaculture facility. Any land, structure, or other appurtenance used for aquaculture. Such term includes, but is not limited to, any laboratory, hatchery, rearing pond, tank, raceway, net pen, cage, raft, longline, geographically defined seafloor, or other structure or defined boundary used in aquaculture.

Aquaculture product. Any product of aquaculture, including but not limited to whole alive or dead aquatic animals, gutted fish, fillets and other forms of raw or processed meat, eggs for human consumption, eggs for reproduction, skin and other animal parts, and alive, fresh and dehydrated aquatic plants, either whole or processed. By-products from aquatic animals grown in aquaculture, such as, fish meal and oil, silage, and hydrolyzed offal, are included.

Aquatic animal. Any finfish, mollusc, crustacean, or other aquatic invertebrate grown in fresh, brackish or saltwater, except amphibians, reptiles, birds and mammals.

Aquatic animal broodstock. Sexually mature aquatic animals used to produce progeny that may be incorporated into an organic aquaculture production system.

Aquatic plant. Any plant grown in an aquaculture facility, including microscopic or macroscopic algae, and excluding vascular plants such as watercress, rice, water hyacinth, and hydroponic crops.

Aquaculture production system. A process for growing aquatic animals and plants in an aquaculture facility.

Bivalve molluscs. Molluscan shellfish including oysters, clams, mussels and scallops, but not including gastropods and cephalopods.

Coldwater finfish. Salmonids, cod, marine flatfish and other species not considered in this section as warmwater finfish.

Fish meal and fish oil. Fish meal is the dried ground tissue of undecomposed whole fish or fish cuttings, either or both, with or without the extraction of part of the oil. Fish oil is the oil from rendering whole fish, fish cuttings, or cannery waste.

Finfish. Aquatic vertebrate animals not including mammals, birds, amphibians and reptiles.

Metabolic products of aquatic animals. Solid and dissolved compounds released by aquatic animals during growth in an aquaculture production system.

Monosex stocks. Populations of aquatic animals of one sex obtained by artificially induced or natural processes, or by manual selection.

Persistent, Bioaccumulative Toxin (PBT). Chemicals that resist breakdown and are persistent in the environment, bioaccumulate in food chains through consumption or uptake, and are a hazard to human health or wildlife. Level 1 PBTs identified by EPA include aldrin/dieldrin, benzo(a)pyrene, chlordane, DDT and its metabolites,

hexachlorobenzene, alkyl-lead, mercury and its compounds, mirex, octachlorostyrene, PCBs, dioxins and furans, and toxaphene. Other candidate PBTs include brominated flame retardants and other halogenated organic compounds. A term related to PBT is POP (persistent organic pollutant) and, for the purposes of these standards, the terms are interchangeable.

Shellfish. Aquatic invertebrate animals including molluscs and crustaceans.

Silage (fish). A mixture of solids and liquids obtained by the breakdown of fish tissue using natural enzymes with or without addition of acids or bases to control spoilage and to enhance enzyme activity.

Triploid. Aquatic animals with three sets (3n) of chromosomes. Most aquatic animals are naturally diploid (2n). Triploid aquatic animals are typically sterile (non-reproductive) and tend to grow faster than diploid aquatic animals.

Warmwater finfish. Finfish with optimum temperatures for growth between 25 and 30 C. Examples include catfish, tilapia, and paddlefish.

Wild fish. Any species of fish or shellfish, raw or processed, harvested from wild sources used for food or in animal feeds, including feeds for aquatic animals.

EXPLANATION

The Act provides: "The term "livestock" means any cattle, sheep, goats, swine, poultry, equine animals used for food or in the production of food, fish used for food, wild or domesticated game, or other non-plant life." The proposed amendment to the definition of livestock in the Final Rule brings the Rule into compliance with the definition in the Act that aquatic animals are livestock so that the Rule includes "fish used for food" as livestock.

§ 205.250 Aquaculture general.

(1) Aquatic animals, aquatic animal products, aquatic plants, and aquatic plant products to be sold, labeled or represented as "100 percent organic," "organic," or "made with organic (specified ingredients or food group(s))," must be produced and handled in accordance with this section: Except that the requirements of Sections § 205.236 through § 205.239 shall not apply to the production of aquatic animals or aquatic animal products and the requirements of Sections § 205.202 through § 205.206 shall not apply to the production of aquatic plant or aquatic plant products.

(2) Aquaculture facilities shall be designed and operated to minimize the release of nutrients and wastes into the environment. The use of water discharges and filtered metabolic products as nutrients for vascular plants in agricultural crops and constructed wetlands is encouraged to be included in organic production system plans. However, the amounts of such discharges and filtered products applied shall not exceed the requirements of targeted plants in the receiving area, and excessive amounts shall not be discharged into unplanned areas. Vascular agriculture crops using nutrients from certified organic aquaculture operations may be certified organic if in compliance with other regulations in this Subpart.

(3) Aquaculture facility managers shall provide for the health and welfare of aquatic animals, preclude prohibited substances, and minimize contamination of aquaculture products from environmental sources.

(4) Metabolic products of one species are recognized as organic resources for one or more other species in an aquaculture production system. Metabolic products of aquaculture species are not considered animal manure under § 205.2, Terms Defined, Manure, and § 205.239 (c) Livestock Living Conditions. Facilities producing aquatic animals must incorporate measures to recycle or biologically process a significant portion of these metabolic products. Where possible, the practice of polyculture of two or more different species grown in the same body of water is encouraged, as is the integration of additional species as water moves through the aquaculture facility or is discharged from it. The use of culture water and associated solid and dissolved constituents for the irrigation of organically produced terrestrial plant crops is encouraged. Aquaponics, the combination of aquaculture and plant hydroponics, is encouraged in organic aquaculture production systems.

(5) Biodiversity of natural aquatic ecosystems, functional integrity of aquatic environments, and the quality of surrounding aquatic and terrestrial ecosystems must be protected. All aquatic animals possessed and grown at an aquaculture facility must be in compliance with all applicable local and national laws.

(6) Adequate measures shall be taken to prevent escapes of cultivated animals and plants from the aquaculture facility and to document any that do occur.

(7) By-products from the production of aquatic animals, such as fish meal, fish oil, silage and hydrolyzed offal, produced in an organic production system, and handled in accordance with organic handling requirements, may be labeled organic.

§ 205.251 Origin of aquaculture animals.

- (a) Aquatic animals grown in aquaculture to be sold as organic must have been under continuous organic management beginning no later than the second day after the beginning of exogenous feeding, where applicable by species, or beginning no later than when 5% of total market weight has been achieved, whichever is greater. However, in either case, substances prohibited in §205.602 and §205.604 are not allowed during earlier life stages;
- (b) Aquatic animals that are removed from an organic production system and subsequently managed on a non-organic facility may not be sold, labeled, or represented as organically produced.
- (c) Broodstock that has not been under continuous organic management may not be sold, labeled, or represented as organic slaughter stock.
- (d) The producer of an organic aquaculture facility must maintain records sufficient to preserve the identity of all organically managed animals and edible and nonedible animal products to assure reliable traceability from farm to market.
- (e) Production of triploid aquatic animals from the application of temperature or pressure shock after fertilization and by crossing tetraploids with diploids is prohibited for fish to be sold as organic.
- (f) Culture of monosex stocks obtained by crossing sex-reversed broodstock or by hybridization is permitted. Culture of monosex stocks selected by visual or manual means is allowed.
- (g) Culture of monosex stocks obtained by direct treatment with steroidal or other hormones (including methyl-testosterone), or by other direct treatment artificial induction methods, is prohibited.
- (h) Cultivation of genetically modified aquatic animals and plants is prohibited.
- (i) In cases where hatchery progeny of aquatic animals are not commercially available, broodstock may be collected from the wild provided that they are collected in a sustainable manner, and where appropriate, in collaboration with government agencies, to assure that natural populations and the collected individuals are protected and that biodiversity in the ecosystem is supported.

EXPLANATION

5% of Total Market Weight.

The table below shows the size of various species to which this clause applies. This table is included for information purposes only for the species shown and does not mandate specific weights at which organic management must begin.

<u>Animal</u>	<u>Market weight</u>	<u>Weight at 5%</u>	<u>Comments</u>
Shrimp	20 gms	1 gm	postlarvae
Atlantic salmon	5,000 gms (5 kg)	250 gms	smolt
Catfish	680-800 gms	34-40 gms	large fingerling
Tilapia	500 gms	25 gms	fingerling
Hybrid Stiped Bass	500 gms	25 gms	fingerling

Cod	2,000 gms	100 gms	fingerling
Cobia	4,000 gms	200 gms	fingerling
Redfish	1,000 gms	50 gms	fingerling
Oyster	90 gms	4.5 gms	1/8"-1/4" spat

§ 205.252 Aquaculture feed.

Option A

- (a) Feed and feeding practices must meet the minimum nutrient requirement of the aquatic animal and minimize the environmental impact of released nutrients on receiving waters.
- (b) To the greatest practical extent, cultured aquatic animals should be provided their natural foods as closely as possible.
- (c) Feeds for aquaculture products for human consumption must assure high human food safety standards and healthfulness.
- (d) Aquaculture feeds must be composed of feed ingredient sources that are organically produced, except that nonsynthetic substances and synthetic substances allowed under §205.603 may be used as feed additives and supplements.
- (e) Wild fish and other wild seafood used to produce fish meal and fish oil for organic aquaculture or livestock feeds may be certified and labeled as organic as provided in this section. However, fish meal and oil produced from wild fish and other wild seafood that is not certified as provided in this section cannot be used in organic production. Wild fish and wild seafood that are certified organic for producing fish meal and oil for aquaculture may not be certified or labeled as organic for human consumption unless allowed elsewhere in this rule. Whole, chopped, or minced wild fish that is not certified as provided in this section may not be used as feed.
- (f) All such fish meal or fish oil must be derived from fishery resources certified to be sustainably managed. Sustainability shall be determined using principles and criteria established by the Marine Stewardship Council or similar internationally recognized fisheries certification organizations. Certification of a fishery by such an organization shall be recognized as compliance with this requirement.
- (g) Use of fish meal and fish oil derived from wild sources that are in compliance with (e) and (f) may qualify as organic under one of the following:
 - (1) Wild fish and other wild seafood, provided that use of such wild fish and wild seafood cannot exceed one pound of wild fish harvested for every pound of aquatic animals cultured.
 - (2) Carcasses, viscera, and trimmings from the processing of wild fish and other wild seafood that are destined for human consumption. The portions of processed wild fish destined for human consumption may not be certified or labeled as organic unless provide elsewhere in this rule.
- (h) Organic aquaculture feeds may include fish meal and oil derived from organically raised aquatic animals, providing the meal and oil is produced from fish of a different genus to the target aquaculture species being fed.
- (i) Silage produced from organic fish that is enzyme-processed, or produced with acids and bases that are organically certified or approved in the National List, may be certified organic.
- (j) Organic aquaculture feeds may include meals and oils containing essential fatty acids produced by organically certified microbial processes.
- (k) For fish meal and fish oil used in organic feeds, levels of unavoidable residual environmental contaminants, including persistent bioaccumulative toxins (PBTs) and

mercury, cadmium, lead, arsenic and tin must be comparable to the lowest levels found in commercially available fish meal and fish oil, provided, however, that the comparable products are classes of fish meal and oil allowed in this section, and do not include those produced with volatile organic solvents not allowed under § 205.603. Contaminants may be removed from fish oil with activated carbon or any process using water as a solvent.

(l) Organic sources of pigments allowed by the U.S. Food and Drug Administration for inclusion in aquaculture feeds may be used.

(m) Manure from organic terrestrial animals that is composted in compliance with §205.203 may be used to fertilize aquaculture ponds in an organic production system. The composted manure must not be applied after at least 30 days prior to harvest of aquatic products for human consumption. Manure, whether composted or not, shall not be applied in aquaculture production systems other than ponds.

(n) The producer of organic aquatic animals shall not:

- (1) incorporate any type of antibiotic or hormone in feeds;
- (2) provide feed supplements or additives in amounts above those needed for adequate nutrition and health maintenance of the species at its specific stage of life;
- (3) feed by-products from mammalian or poultry slaughter;
- (4) use feedstuffs extracted with synthetic solvents not approved on the National List;
- (5) use feed, feed additives, and feed supplements in violation of the U.S. Federal Food, Drug, and Cosmetic Act;
- (6) use artificial and/or synthetic pigments or artificial coloring agents;
- (7) use any genetically modified organism or product thereof as a feed ingredient; or
- (8) apply manure that is not composted according to (m) to any aquaculture system.

Option B

(a) Feed and feeding practices must meet the minimum nutrient requirement of the aquatic animal and minimize the environmental impact of released nutrients on receiving waters.

(b) To the greatest practical extent, cultured aquatic animals should be provided their natural foods as closely as possible.

(c) Feeds for aquaculture products for human consumption must assure high human food safety standards and healthfulness.

(d) Aquaculture feeds must be composed of feed ingredient sources that are organically produced, except that nonsynthetic substances and synthetic substances allowed under §205.603 may be used as feed additives and supplements.

(e) Organic aquaculture feeds may include fish meal and oil derived from organically raised aquatic animals, providing the meal and oil is produced from fish of a different genus to the target aquaculture species being fed.

(f) Silage produced from organic fish that is enzyme-processed, or produced with acids and bases that are organically certified or approved in the National List, may be certified organic.

- (g) Organic aquaculture feeds may include meals and oils containing essential fatty acids produced by organically certified microbial processes.
- (h) For fish meal and fish oil used in organic feeds, levels of unavoidable residual environmental contaminants, including persistent bioaccumulative toxins (PBTs) and mercury, cadmium, lead, arsenic and tin must be comparable to the lowest levels found in commercially available fish meal and fish oil, provided, however, that the comparable products are classes of fish meal and oil allowed in this section, not including those produced using solvents not allowed under § 205.603. Contaminants may be removed from fish oil with activated carbon or with any process using water as a solvent.
- (i) Organic sources of pigmenting compounds approved by the U.S. Food and Drug Administration for inclusion in aquaculture feeds are allowed.
- (j) Manure from organic terrestrial animals that is composted in compliance with §205.203 may be used to fertilize aquaculture ponds in an organic production system. The composted manure must not be applied less than 30 days prior to harvest of aquatic products for human consumption. Manure, whether composted or not, shall not be applied in aquaculture production systems other than ponds.
- (k) The producer of organic aquatic animals shall not:
- (1) incorporate any type of antibiotic or hormone in feeds;
 - (2) provide feed supplements or additives in amounts above those needed for adequate nutrition and health maintenance of the species at its specific stage of life;
 - (3) feed by-products from mammalian or poultry slaughter;
 - (4) use feedstuffs extracted with synthetic solvents not approved on the National List;
 - (5) use feed, feed additives, and feed supplements in violation of the U.S. Federal Food, Drug, and Cosmetic Act;
 - (6) use artificial and/or synthetic pigments or artificial coloring agents;
 - (7) use any genetically modified organism or product thereof as a feed ingredient; or
 - (8) apply manure that is not composted according to (j) to any aquaculture system.

EXPLANATIONS

Fish Meal and Oil from Wild Fish. The Aquaculture Working Group is proposing two alternatives for sources of fish meal and oil. Alternative A would allow the certification of wild fish, under certain conditions, for producing fish meal and oil for use as ingredients in aquaculture feeds. Alternative B would not provide for the use of fish meal and oil from wild fish. In this case, limited amounts of fish meal and oil could be included in aquaculture feeds as additives and as supplements.

This dual approach considers that organic certification of wild fish, while allowed under the Act, has yet to be accepted by the organic community. Should the USDA establish that wild fish are an appropriate source, then the Working Group proposes that Alternative A be adopted in the Final Rule. Should wild fish not be an acceptable source at this time, the adoption of Alternative B is proposed.

Contaminants. The Aquaculture Working Group is aware that unavoidable residual environmental contamination is a significant concern amongst organic consumers, including

those who purchase and eat aquaculture products. Consumers of organic products have reasonable expectations that contaminant levels in organic products are lower than with conventionally produced products. Considerable progress has been made recently, and continues to be made, in the reduction of unavoidable residual environmental contamination in aquaculture products.

Therefore, the Working Group proposes the inclusion of (k) in Alternative A, and (h) in Alternative (B). It is realized that concern about residual environmental contamination is not just for aquaculture products, but contamination of foods is of concern across the entire spectrum of organic foods. § 205.671 *Exclusion from organic sale* of the Final Rule is not applicable for aquaculture since tolerance levels established by the US Environmental Protection Agency are generally for pesticide levels in terrestrial crops.

In addition to proposing these provisions for minimizing levels of contaminants in aquaculture feeds, the Aquaculture Working Group requests that the USDA undertake the development of standards applicable to all organic foods with the establishment of methods for determining specific numerical tolerance levels for contaminants of concern to organic consumers for all foods. Contaminants in aquaculture feeds should be further considered at the time that contaminant standards are established for all other organic commodities. The Working Group requests that members of the aquaculture community be represented in such efforts.

Mammalian and Poultry Slaughter By-products. The Aquaculture Working Group spent considerable effort addressing the question of whether to provide for the inclusion in organic aquaculture feeds by-products from the processing of terrestrial livestock. While the Group was mindful that § 205.237 *Livestock Feeds* of the Final Rule states: "(b) The producer of an organic operation must not: (5) Feed mammalian or poultry slaughter by-products to mammals or poultry" there was considerable discussion about using mammalian and avian meals as organic feed ingredients. Slaughter by-products can be a source of essential dietary nutrients in aquaculture provided they are produced from organically raised healthy animals and under veterinary supervision following existing processing methods approved by the USDA and other government authorities.

It may be possible to formulate effective diets for carnivorous finfish species (such as salmonids and other marine finfish species) with low amounts of fish meal and fish oil by using alternative dietary protein sources, including plant protein ingredients plus vertebrate and invertebrate animal by-products meals to provide essential amino acids.

The Working Group agreed that there is no compelling scientific rationale to prohibit by-products from organic terrestrial animals in feeds for organic aquatic animals. The transmission of prion diseases from by-products of warm blooded, terrestrial animals to very distantly related cold-blooded aquatic animals is highly improbable.

However, there are tradeoffs in allowing or disallowing the use of terrestrial animal processing by-products. Without the use of terrestrial animal byproduct meals, and with restrictions on the use of fish meal in aquatic animal diets, it may be necessary to include synthetic amino acids on the National List to allow formulation of nutritionally complete diets and achieve organic certification for some carnivorous animals. The use of organically certified terrestrial animal processing by-products would eliminate the need for synthetic amino acids and would reduce the amount of fish meal supplements necessary for good aquatic animal growth and health. Moreover, use of by-products of terrestrial animal processing would encourage waste reduction and nutrient recycling, thus supporting important organic principles.

On the other hand, the inclusion of by-products of terrestrial animal processing is prohibited in organic livestock feeds. Many consumers prefer that these by-products not be used

in animal production and some grocery brands and food retailers prohibit their use. In addition, some people who consider themselves vegetarians nonetheless eat finfish and crustaceans. Allowing terrestrial animal by-products in aquatic animal feed might lead these individuals to find organic fish products unacceptable.

The aquaculture working group proposes these draft standards with a prohibition on the use of by-products of terrestrial animal processing in feed as is the case with livestock. However, we ask that the NOSB and other commenters on the draft standards consider the tradeoffs involved.

§ 205.253 Aquaculture health care.

(a) The aquaculture producer must establish and maintain preventive health care practices, including:

- (1) Selection of aquatic animals and plants with regard to suitability for site-specific conditions;
- (2) Provision of a source of nutrition or feed sufficient to meet nutritional requirements, including vitamins, minerals, protein and/or amino acids, fatty acids, and energy;
- (3) The maintenance of healthy water rearing conditions including control of potentially toxic metabolic compounds (ammonia and carbon dioxide) within acceptable ranges for the species, appropriate water temperatures, adequate levels of oxygen, and pH, with the prevention of extended excursions to stressful extremes. Efforts to maintain such conditions must be documented by a suitable monitoring and record keeping program for key water quality parameters that affect health. The frequency of such monitoring shall depend on the culture system, site, species, life stage, and environmental characteristics;
- (4) Establishment of biosecurity measures to limit entry of pathogens into the aquaculture production system and operational procedures and sanitation practices to minimize the occurrence, transmission, and severity of disease epizootics. Biosecurity measures should not be used as an approach to compensate for growing conditions that compromise aquatic animal health from elevated stress and associated immunosuppression;
- (5) Provision of conditions that allow for freedom of movement and minimization of stress appropriate to the species;
- (6) Implementation of physical accommodations to the aquaculture facility as needed to promote the animal's welfare and minimize pain and stress; and
- (7) Administration of vaccines, other veterinary biologics, and approved natural supplements, such as supplementation or treatment of healthy animals with endemic beneficial bacteria, appropriate to the species and location.

(b) When preventive practices and veterinary biologics are inadequate to prevent disease, a producer may administer synthetic medications, provided that such medications are allowed under §205.603. Parasiticides allowed under § 205.603 may be used on:

- (1) Brood stock, but none that are to be sold, labeled, or represented as organically produced.

(c) The producer of organic aquaculture products must not:

- (1) Sell, label, or represent as organic any aquatic animal or edible product derived from any aquatic animal treated with antibiotics, any substance that contains a synthetic substance not allowed under §205.603, or any substance that contains a nonsynthetic substance prohibited in §205.604.
- (2) Administer any type of animal medication, other than USDA approved or licensed vaccines, in the absence of illness;
- (3) Administer hormones for growth promotion;
- (4) Administer synthetic parasiticides;

(5) Administer animal drugs in violation of the U.S. Food and Drug Administration regulations, and vaccines in violation of US Department of Agriculture regulations;
or

(6) Withhold medical treatment from a sick animal in an effort to preserve its organic status. All appropriate medications must be used to restore an animal to health when methods acceptable to organic production fail. Aquatic animals treated with a prohibited substance must be clearly identified and shall not be sold, labeled, or represented as organically produced. Facilities containing aquatic animals during medical treatment are not required to undergo conversion periods specified in paragraphs (k), (l) and (m) of § 205.255 Aquaculture facilities.

§ 205.254 Aquaculture living conditions.

(a) Aquaculture systems must establish and maintain living conditions that accommodate the health and natural behavior of the aquatic animals, including:

(1) an environment operated within the tolerance limits characteristic of the aquatic animal and stage of development by monitoring and maintaining water qualities appropriate for the production system and species including temperature, pH, salinity, photoperiod, dissolved oxygen, ammonia, and nitrite concentrations, without sudden changes or prolonged exposure to extremes;

(2) containment that allows the animals:

(i) freedom of movement and opportunity to exercise within the culture system;

and

(ii) minimal potential for injury.

(b) The culture system must be managed to minimize the risk of losses of cultured stock and stress to cultured aquatic animals caused by predators. Organic aquaculture facilities must develop an integrated predator deterrence plan that identifies potential predators, appropriate deterrence methods, how predator behavior will be modified by application of deterrence methods, contingencies for failure of the plan to achieve objectives, and documentation of control methods and effects. Examples of such control measures include site selection, physical barriers, repellents, and legal predator deterrence methods. Lethal measures may be taken only when predators threaten human safety or are necessary for predator welfare (e.g. birds are entangled and injured) and must include appropriate documentation. Lethal measures must be in compliance with local laws and the laws of the United States.

(c) Non-organic aquatic animals may be used in aquaculture production systems for controlling pests, such as weeds, snails, and algae. Triploid animals may be employed provided that the animals are legal to culture, are not labeled organic, and are readily separated at harvest from the aquatic animals under organic management.

§ 205.255 Aquaculture facilities.

- (a) Location of organic aquaculture facilities shall take into consideration the maintenance of the aquatic environment and surrounding aquatic and terrestrial ecosystem.
- (b) Water sources for aquaculture facilities must be carefully selected and managed to avoid potential environmental contaminants that can harm human health.
- (c) Facility boundaries shall be clearly identified.
- (d) Organic aquaculture facilities shall be at appropriate distances from potential contamination sources including pesticide drift and other possible contaminants from conventional aquaculture.
- (e) Pond berms and tank tops shall be at sufficient elevations to prevent contamination from the environment during floods.
- (f) Potentially adverse environmental impacts from aquaculture production must be minimized. The rate of effluent discharge must not exceed the natural assimilative capacity of an area within 25 meters of the site boundary nor contribute significantly to environmental degradation beyond 25 meters of the site boundary. For the purpose of this paragraph, "site" is the area licensed or leased by government authorities, or other parties, for the aquaculture facility.
- (g) Every organic aquaculture facility must develop a nutrient management plan that evaluates the technical and economic feasibility of options appropriate for the culture system to recover solid and dissolved waste nutrients in other plant and animal crops. Options may include using settled solids as a soil amendment, suspended solids to grow filter-feeding aquatic animals, and dissolved nutrients as a nutrient source for terrestrial crops, aquatic plants, or crops grown hydroponically.
- (h) Facilities should not significantly impact freshwater quality or supply and should not salinize or otherwise contaminate soils.
- (i) Effluent discharges must comply with all local, state and national water quality laws and regulations, and include treatment when necessary.
- (j) Cultured organisms that are species-distinct or genetically-distinct populations from native organisms in adjacent aquatic environments must be managed with appropriate security measures (mechanical, physical, and biological barriers) to eliminate to the extent practical escapes due to predators, adverse weather conditions (including floods), or facility damage. The facilities must include preventative measures against possible escapes into the natural environment of the aquatic animals in production, including during local floods. A containment management plan must describe measures to prevent escape, procedures to detect and document escapes should they occur, and actions to be undertaken in the event of escape.
- (k) Open water net-pens and enclosures are permitted where water depth, current velocities and direction, stocking densities, and other factors act to adequately disperse metabolic products in order to minimize accumulation of discharged solids on the bottom sediments under the net pens. However, water currents should not be excessive to cause the fish to expend excessive energy to swim and to be unable to consume food. Monitoring shall be employed to ensure that the natural assimilative capacity at the site is not overburdened. Facility managers shall take all practicable measures to prevent transmission of diseases and parasites between cultured and wild aquatic animals. Use of

multiple species of aquatic plants and animals to recycle nutrients must be included in every management plan. Except as may be provided in § 205.601 or § 205.602, chemical treatment of biofouling organisms on nets is not allowed. An organic conversion period of at least one year, or one crop cycle, whichever is less, shall be required.

(l) Production systems with direct soil-water contact are allowed provided that a conversion period of one year or one crop cycle, whichever is less, occurs under organic management before production can be certified organic as specified in § 205.202, Land requirements.

(m) Production systems with containment vessels of plastic, metal or concrete surfaces are allowed provided that a conversion period of one year or one crop cycle, whichever is less, occurs under organic management before production can be certified organic.

(n) Recirculating systems are permitted if the system supports the health, growth, and well-being of the species, including:

(1) minimization of disease organisms being introduced vertically through eggs or otherwise from parents, from water inflows, from feeds, from vectors including birds, and humans, or other sources.

(2) frequent testing to provide for the maintenance of healthy water conditions that meet the natural requirements of the species with respect to control of potentially toxic metabolic compounds (ammonia, carbon dioxide, etc.), optimum temperatures, adequate levels of metabolic inputs (oxygen and feed), and pH, all within acceptable ranges depending upon the species, with the prevention of excursions to stressful extremes, and with sufficient dewatering and rewatering to prevent accumulation of toxic compounds.

(3) minimization of other health compromising stresses.

(4) stocking density levels that take into consideration animal health and overall well-being, including the natural schooling characteristics of the species.

(5) the provision of adequate backup life support systems to provide appropriate maintenance of water quality and dissolved oxygen levels in the event that primary life support systems fail.

§ 205.256 Aquaculture additional [Reserved].

§ 205.257 Molluscan shellfish [Reserved].

§ 205.258 Farmed aquatic plants.

- (a) Aquatic plant production in any aquaculture production system shall meet all relevant crop production standards.
- (b) Aquatic plants may be grown in organic systems for human consumption and as feed for aquatic species that utilize algae for food, provided that:
 - (1) any pond or containment vessel from which algae are intended to be represented as "organic," must have had no prohibited substances as listed in § 205.105, applied for a period of 1 year immediately preceding harvest of the crop, except, non-organic macro-nutrients and micro-nutrients, including trace metals, vitamins, and chelating compounds, are allowed to have been in prior uses where non-synthetic nutrients and compounds suitable for the algae species were not available.
 - (2) aquatic plants may be provided dissolved non-organic macro-nutrients and micro-nutrients, including trace metals, vitamins, and chelating compounds, where non-synthetic nutrients and compounds suitable for the algae species are not available; however, the dissolved amounts shall not exceed those necessary for healthy growth of the plants, and such culture media shall be disposed of in a manner that does not adversely impact upon the environment.
 - (3) the pond or containment vessel have adequate berm elevations with distinct defined boundaries and buffer zones with runoff diversions to prevent the unintended application of a prohibited substance to the pond or containment vessel, or allow contact with a prohibited substance applied to adjoining land that is not under organic management.
- (c) Manure from terrestrial animals may not be used to fertilize aquatic plants unless composted as provided under § 205.252 Aquaculture feed.

§ 205.259 Harvest, transport, post harvest handling, and slaughter of aquatic animals.

- (a) Handling of stock during harvesting, transport, and slaughtering operations must be carried out with minimal disturbance and stress to the aquatic animal. Transportation and slaughter must be done as fast and humanely as possible.
- (b) Harvest operations must cause minimal disturbance to the natural environment.
- (c) Aquatic animals transported to slaughter and processing, or to live haul markets, shall be transported under conditions appropriate to the species and in such manner to meet the aquatic animal's specific needs and minimize the adverse effects of:
 - (1) water quality
 - (2) time spent in transport
 - (3) animal density
 - (4) metabolic substances
 - (5) escape
- (e) Fish should be held in high quality water for the duration of a fasting period prior to transport and slaughter for a period that allows the clearance of the stomach and gut contents.
- (f) Just prior to slaughter, finfish must be killed by a method that renders them instantly insentient before or immediately after they are taken from the water.
 - (1) Permitted procedures include:
 - (i) concussion to the head promptly followed by severing the gill arches or decapitation.
 - (ii) electrical stunning immediately followed by severing the gill arches or decapitation.
 - (iii) electrocution.
 - (iv) ice slurry for warmwater marine finfish; provided that this method will be only permitted for five years after the date when organic standards for farmed aquatic animals are promulgated as an amendment to the Final Rule.
 - (2) Prohibited are:
 - (i) slaughtering of finfish using ice or ice slurry except as provided in (v) above.
 - (ii) use of carbon dioxide.
 - (iii) use of synthetic anesthetics, including MS-222.
 - (iv) use of natural plant anesthetics, including clove oil, not approved by the U.S. Food and Drug Administration for this purpose.
 - (v) suffocation or asphyxiation (leaving fish to die in air).
 - (vi) exsanguination (bleeding) without stunning.
- (g) Slaughter using ice or ice slurry is allowed for crustaceans, molluscs, and other aquatic animals that are non-sentient.
- (h) All applicable requirements under the U.S. Food and Drug Administration's seafood Hazard Analysis Critical Control Point regulations for raw material acquisition, processing and handling must be followed.

- (i) Where applicable, maintenance of the cold chain from the point of slaughter up to the sales point must be strictly observed in order to prevent any deterioration in product quality. Appropriate time-temperature records shall be maintained.
- (j) Strict human hygiene must be observed during slaughtering and evisceration to ensure adequate cleanliness.
- (k) The disposal of harvest water, blood water, viscera and disinfectant should pose no threat to wild or farmed fish or the environment and comply with existing laws.
- (l) The provisions of § 205.272 *Commingling and contact with prohibited substances prevention practice standard* from the point of slaughter up to the sales point must be strictly observed.