

SUPPLEMENT TO INTERIM FINAL REPORT
(Bivalve molluscs)
Of the
Aquaculture Working Group
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U.S. Department of Agriculture
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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, aquaculture producers and suppliers, and environmental interests. Included in this group are present and former growers of bivalve molluscs and scientific experts in this field. With the submission of our *Interim Final Report* dated January 13, 2006,¹ the AWG partially satisfied 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.

At that time, the Aquaculture Working Group was considering the adoption of standards for bivalve molluscan shellfish harvested from the ocean. Due to the complexities involved, the Working Group required additional time to prepare this supplemental proposal. Bivalve molluscs of interest include oysters, clams, mussels and scallops.

Our discussions were informed by the Organic Food Production Act,² the Final Rule³ (including its Preamble⁴), our *Interim Final Report*, the National Organic Standards Board Livestock Committee's February 20, 2007, report *Aquaculture Standards* -- adopted by the NOSB on March 29, 2007,⁵ and the May 30, 2001, NOSB Aquatic Animal Task Force May 30, 2001 *Recommendation on Operations that Produce Aquatic Animals*.⁶

The AWG performed its work through conference calls and email exchanges. Formal public review of this Supplement to our Interim Final Report will occur through normal NOSB processes involving public comment.

Aquaculture Working Group
George S. Lockwood, Chair

July 9, 2007

¹ <http://www.ams.usda.gov/nop/TaskForces/AATFInterimFinalReport.pdf>

² <http://agriculture.senate.gov/Legislation/Compilations/AgMisc/OGFP90.pdf>

³ <http://www.ams.usda.gov/nop/NOP/standards.html>

⁴ <http://www.ams.usda.gov/nop/NOP/standards/FullText.pdf>

⁵ http://www.ams.usda.gov/nosb/CommitteeRecommendations/March_07_Meeting/Livestock/AquacultureRec.pdf

⁶ http://www.ams.usda.gov/nosb/lscmmRMR/recommendations/aquatic_animals.html

INTRODUCTION

Developing organic standards for bivalve molluscs involves special considerations. Bivalves are farmed on seafloor parcels that are owned by the producer or leased to the producer by a public body, or on public owned seafloor, rather than on privately owned farmland. In each of these, farmed bivalves typically consume wild feed (microalgae and other seston) that they filter from natural waters, rather than feed which is prepared for them. As a result, we drew on several different organic production systems in drafting organic standards for molluscs. These included: a) harvest of wild crops and kelp from relatively unmanaged lands or waters; b) honey production where bees forage from a relatively wide area that is usually not entirely managed by organic producers; and c) organic production of poultry and mammals.

The Recommendations of *Operations that Produce Aquatic Animals* of May 30, 2001, includes the following relative to considerations of organic bivalve molluscs:

MOLLUSC PRODUCTION

In considering the mollusc production as a complete system, the Task Force concludes that there is insufficient compatibility with the requirements of the OFPA to warrant the development of certification standards for such systems. The Task Force concludes that mollusc producers are not called upon to make a sufficient number of the management decision imposed by the statute nor could certification standards create significant differentiation between organic and nonorganic operations.

The Preamble to the Final Rule considers:

Crop Production - Changes Based on Comments

(8) Greater Rigor in the Wild Harvest Production Organic System Plan. A number of commenters stated that the wild-crop harvesting practice standard was insufficiently descriptive and that the proposed rule failed to apply the same oversight to wild harvest operations as it did to those producing crops and livestock. Some commenters maintained that the proposed rule did not require a wild harvest producer to operate under an approved organic system plan. These commenters proposed specific items, including maps of the production area that should be required in a wild harvest operation's organic system plan. One commenter recommended that the definition for "wild crop" be modified to allow the harvest of plants from aquatic environments.

We amended the practice standard for wild-crop harvesting to express the compliance requirements more clearly. Wild-crop producers must comply with the same organic system plan requirements and conditions, as applicable to their operation, as their counterparts who produce crops and livestock. Wild harvest operations are production systems, and they must satisfy the general requirement that all practices included in their organic system plan must maintain or improve the natural resources of the operation, including soil and water quality. We modified the practice standard to emphasize that wild harvest production is linked to a designated site and expect that a certifying agent would incorporate mapping and boundary conditions into the organic system plan requirements. Finally, we changed the definition of "wild crop" to specify that harvest takes place from a "site" instead of "from land," thereby allowing for aquatic plant certification.

Bivalve molluscs grown in the ocean forage upon natural phytoplankton (microalgae that are wild aquatic plants) and other seston. In view of the above, and with other considerations discussed below, the AWG established criteria for the proposed standards for organic bivalve molluscs.

Organic system plan. We propose that operators of organic bivalve mollusc farms develop organic system plans that include maps of mollusc production areas as well as maps of zones of forage production. A wide variety of management considerations must be included in the organic system plan.

Organic honey and kelp. Some certifiers of organic honey operations require growers to obtain affidavits from adjacent land owners within the bee forage area that they do not use pesticides and other prohibited substances. In the case of wild kelp harvested from the ocean, the harvester of this wild aquatic plant crop must demonstrate that there are no discharges of prohibited substances nearby that could contaminate the kelp.

Organic certification of honey bees and marine kelp provides valuable precedents for wild food sources for organic production.

Process not safety. Bivalve molluscs forage upon marine seston, principally microalgae. On occasion this seston can include human pathogens. Food safety is the jurisdiction of the U.S. Food and Drug Administration and not U.S. Department of Agriculture and its National Organic Program. The organic claim is a process claim, not a food safety claim.

Therefore, our proposal does not include efforts to improve on the U.S. National Shellfish Sanitation Program that is a bivalve food safety program. [See: <http://www.cfsan.fda.gov/~ear/nss2-toc.html>] However, all possible inputs into zones of forage production are important since prohibited substances may be included in these inputs. We have therefore developed criteria for delineating zones of forage production and propose that the organic system plan identify potential sources of prohibited substances that flow into such zones, including sewage. Sewage is a source of contamination of a wide range of substances, some prohibited, not just human pathogens.

Zone of forage production. Our proposal includes the delineation of the zone of forage production. To accomplish this we propose that hydraulic modeling investigations provide information about how shoreline currents influence the zone of forage production, and where water exchanges might be important considerations.

Once the hydraulic zone of influence (HZI) is established, we propose that organic certification be prohibited for waters that receive sewage and other point discharges, waters with adjacent land activities involving prohibited substances, and waters where marinas, boats, and similar activities influence the zone of forage production.

Use of sewage indicator organisms. While the use of sewage indicator organisms for microbial food safety concerns is not appropriate in this context, we propose their use as indicators of other forms of man-made contamination. Sewage discharges, both human and storm runoff, in many cases is the principle source of prohibited substances flowing into the zone. Therefore, requiring the certified grower to monitor for indicator organisms on a regular basis is proposed.

Origin of livestock-hatchery seed. From the background documents, it is clear that organic system plans must demonstrate managed farming systems. Obtaining bivalve mollusc seed from the wild involves low levels of system management, while obtaining seed from hatcheries requires greater management effort. Even if some molluscs such as mussels are not now hatchery produced in some areas of the country, the technology and capability to do this is well established.

Environmental considerations. A clear mandate articulated in the Preamble is that all practices included in the organic system plan must maintain or improve the natural resources of the operation. We therefore propose numerous conditions on growing and harvesting that are intended to protect other forms

of life on the ocean floor and surrounding areas. Moreover, a healthy bivalve farm substantially reduces water turbidity from microalgae and other seston. This reduction can be environmentally beneficial where turbidity results from increased flows of nutrients and organic matter from human activities.

Differentiation from conventional bivalve production. The proposed regulations provide for substantial differentiation from conventional bivalve aquaculture in many respects. In order to prevent inclusion of prohibited substances, bivalve growing areas and zones of forage production are delineated, frequently monitored, and managed. Certain materials for facilities are prohibited. Special attention is provided to assure a minimum of environmental disturbance from bivalve growing and harvest activities.

Proposed Standards for Organic Bivalve Molluscs.

§ 205.2 TERMS DEFINED

HACCP. Hazard Analysis Critical Control Point, a mandatory program for seafood processors under the U.S. Food and Drug Administration and the National Oceanic and Atmospheric Administration. The program requires the analysis and management of critical processing variables that impact upon the healthiness and safety of seafood products.

NSSP. National Shellfish Sanitation Program operated under jurisdiction of the U.S. Food and Drug Administration and designated state and foreign shellfish control authorities.

Bivalves. The term “bivalve” applies to bivalve molluscs including oysters, clams, mussels, and scallops. Gastropod molluscs, such as abalone and conch, and cephalopods, such as octopus and squid, are not included.

Seed, juvenile or spat. The stage of development after the larval, free-swimming stage, which, having developed an eye spot, foot, and gills, settles onto a suitable substrate (on shell, for example). This life state is also sometimes referred to as “*spat.*”

§ 205.257 BIVALVE MOLLUSCS

(a) Bivalve molluscs general:

- (1) Except as otherwise provided, all provisions of § 205.250 through § 205.259, Aquaculture, and § 205.600 through § 205.604, National List, in this subsection apply to bivalves.
- (2) An organic bivalve producer must maintain records to preserve the identity of all organically managed bivalves and edible and non-edible products to assure reliable traceability from growing area to market.
- (3) Bivalve growing areas must be under organic management for at least three years before production can be certified organic.
- (4) All applicable laws, regulations and procedures of national and local governments, including NSSP, HACCP, and environmental laws and regulations, must be obeyed.
- (5) Bivalves that are removed from a certified operation and subsequently managed on a non-certified operation may not be sold, labeled or represented as organically produced.

(b) Organic system plan for bivalve production:

A producer of organic bivalve molluscs must develop an organic system plan in accordance with the provisions in § 205.201. The organic system plan for bivalve production must include:

- (1) A map of the growing area that indicates the boundaries of organically managed areas, adjacent natural areas, and non-organically managed areas that may influence the operation, and water circulation patterns. The location of all industrial or domestic point sources of contamination must be included on the map;
- (2) For bivalve molluscs that forage on pelagic wild microalgae and other seston, the organic system plan must include an approximate delineation of the hydraulic zone of influence (HZI) for forage production for the shellfish farm. The HZI is the zone of production for forage consumed by the farmed bivalve molluscs.

- (3) Determination of the HZI may be based on hydraulic models, field observations that measure and define circulation, and/or tracer studies. The organic system plan shall include a map of the HZI with grids representing forage production areas for the farm that contain 10% or less of the surface area of the HZI. In addition, methods for delineating the HZI must be described, as well as locations of any freshwater sources and other factors impacting production of forage for organic bivalve molluscs. The HZI determination may include approaches and methods such as:
- i. establishing the tidal prism by measuring tidal amplitude.
 - ii. determining water circulation patterns by drogue studies (Lagrangian methods) or comparable drift methods, tracer studies using dye, and current meters.
 - iii. locating sources of fresh water inflow.
 - iv. establishing Depth/Salinity/Temperature relationships.
 - v. Calculation of the HZI using a mathematical model if sufficient preexisting data is available.

The analysis shall determine estimated average and extreme ranges of circulation, and if vertical mixing occurs. The results of this analysis must include drawings or images of circulation patterns and how prevailing or storm wind conditions effect the HZI.

The HZI must be estimated under a representative range of typical conditions. Identification or quantification of extreme climatic conditions that could affect the HZI must be discussed in the organic system plan.

- (4) Identification and location of all point and non-point sources of prohibited substances and other potential contaminants, such as heavy metals, from urban, residential, industrial and agricultural sources that may adversely affect the area of natural forage production and the bivalve growing facility. The plan must include a determination of the distance from the bivalve growing site to any point or identified area from which there is a significant risk of contamination;
- (5) Documentation of environmental conditions in the growing area, including water quality and land use in contiguous watersheds;
- (6) A description of a water quality monitoring program that indicates parameters measured, frequency of measurement, and location of sampling stations;
- (7) A description of the procedures used for the culture and harvest of bivalve molluscs, including materials used for rafts, nets, or other structures;
- (8) A description of measures that will be implemented to minimize impacts of culture operations on ocean ecosystems and wildlife, including discussions of:
- i. the impacts of farm structures (if any), growing practices, and harvest methods.
 - ii. benthic deposition.
 - iii. estimates of nutrient flows, including recycling of nutrients from anthropogenic sources and adequacy of wild forage in the water column.
 - iv. predator control methods.

- v. species that use the habitat, including those designated as threatened or endangered. If threatened or endangered species are present, the plan must indicate how culture and harvest activities are in compliance with applicable laws that protect such species.
 - (9) A description of biosecurity practices to prevent to the occurrence and spread of diseases or parasites;
 - (10) A waste management plan that provides for:
 - i. reuse, recycling and proper disposal of nets, ropes, waste shell, grade-outs and dead-stock.
 - ii. composting or recycling of waste biological materials, including shells, to the extent practicable.
 - iii. control of offensive odors.
 - (11) A schedule for surveillance and methods of removing accidentally released culture materials or equipment from beaches or natural waters adjacent to the culture site;
 - (12) A process for the resolution or mitigation of complaints, conflicts, and other multi-stakeholder issues.
- (c) Origin of bivalves molluscs:
- (1) The use of hatchery produced seed is required. However, for a period of five years from the date these regulations are adopted, the collection of larvae or natural set seed from the ocean is allowed under the following conditions:
 - i. wild seed only can be collected from wild animals that are actively managed by the appropriate government resource management agency to ensure sustainable wild populations. The organic system plan must include provisions that consider and control the impacts of wild seed collection activities and methods to monitor those impacts.
 - ii. wild seed collection methods must not compromise the ecological integrity of the aquatic ecosystem in which they are being used.
 - iii. the organic system plan must include provisions to minimize overset of wild seed.
 - (2) Production of triploid bivalves is prohibited by § 205.251 Origin of aquaculture animals, paragraph (e).
- (d) Bivalve mollusc forage production:
- (1) Bivalves grown in onshore ponds, tanks, and other containers may be supplied organic aquatic plants produced under § 205.258 Farmed aquatic plants.
 - (2) Bivalves may forage on wild microalgae and other seston at locations classified by appropriate government authorities under the NSSP as “remote”, “approved” or “conditionally approved,” subject to specific provisions of these standards. Bivalves grown at locations that are not classified, or classified as “restricted,” “conditionally restricted,” or “prohibited” may not be sold, labeled or represented as organically produced.
 - (3) In the event of a closure ordered by a state shellfish control authority, the waters under organic production must remain closed for an additional seven days after these waters are

reopened by that authority and independent testing by the grower after reopening determines that requirements under (e) Contamination indicators are satisfied.

(e) Contamination indicators:

- (1) Measuring fecal coliforms as an indicator for contamination by prohibited substances is required.
- (2) In addition to monitoring by government agencies for indicator organisms required under NSSP, the organic system plan must include monitoring by the producer for microbial indicators of possible contamination by prohibited substances for each site with periodic testing of seawater. Monitoring must be site specific with specifications determined by the initial site analysis and ongoing evaluation of potential contamination. The organic system plan must consider historical information and must be updated annually.
- (3) The annual review of the organic system plan shall consider incorporating new technologies for monitoring contamination when new technologies become available and can be used with reliable and consistent interpretation.
- (4) Locations for sample stations must be identified in the organic system plan and indicated on the site map. There must be at least two sampling stations for each farm site. At least one station must be located near the boundary of the farm closest to any potential source of contamination. Additional sample stations must be utilized where potential sources of contamination exist near other boundaries of the farm site.
- (5) Periodic sampling and testing for fecal coliform indicators must occur at least twice each month at approximately two week intervals with records maintained for at least five years. All stations must be sampled within the same 12 hr period, or within the same tidal cycle, whichever is shorter.
- (6) Harvesting of bivalves is allowed in growing waters when fecal coliform water sample testing results indicate an arithmetic mean for all stations that does not exceed 14 MPN/100 ml of seawater.
- (7) Should the arithmetic mean exceed 14 MPN/100 ml of seawater, bivalves may not be harvested for organic sale until sample results are 14 MPN/100ml or less. Should two consecutive sampling dates indicate an arithmetic mean of greater than 14 MPN/100 ml then harvesting for organic sale must be suspended until two consecutive sample dates yield consecutive acceptable (≤ 14 MPN/100ml) results.
- (8) Methods for determination of fecal coliform indicator organisms are described in the U.S. Food and Drug Administration Guide for the Control of Molluscan Shellfish, 2005 (or subsequent editions), IV. GUIDANCE DOCUMENTS, II-Growing Areas, .10 Approved National Shellfish Sanitation Program Laboratory Tests. [<http://www.cfsan.fda.gov/~ear/nss3-42j.html>].

(f) Animal health care practices:

- (1) Hatchery bivalve seed must be certified to be specific pathogen free by a qualified pathologist according to applicable State and Federal regulations.

- (2) Handling and growing area management practices must minimize the occurrence and spread of diseases and parasites.
 - (3) Biosecurity measures must protect against entry of new pathogens, parasites or pests, or their spread. Such biosecurity measures must be specified a specific biosecurity or health section of the organic system plan.
 - (4) Saline and freshwater dipping, rinsing or spraying may be employed to destroy shell parasites, predators or bacteria.
- (g) Living conditions:
- (1) Bivalves must be under continuous organic management from the time seed is placed in a certified growing area. All product labeled organic must achieve at least 95 percent of its biomass while under organic management.
 - (2) Sites must provide appropriate rates of water exchange with sufficient tidal currents to assure a good supply of food for bivalve crops while maintaining a healthy environment for other marine organisms.
 - (3) Bivalves shall be stocked at densities and total numbers that:
 - i. optimize the health and growth of the bivalves.
 - ii. do not result in changes to the benthos except in areas of the farm tenure or lease where molluscs are cultured.
 - iii. remove quantities of plankton or microorganisms from the water sufficient to cause damage in ecosystems on or adjacent to the farm.
 - (4) The producer must assure adequate protection of bivalves from predators with a pest management plan for each location. Where possible, the plan should provide for pest removal without using lethal means of predator control. The use of quicklime (CaO), biocides, pesticides, herbicides, and other chemical toxins are prohibited to control or eliminate predators and other nuisance organisms.
 - (5) Removal of biofouling, pests, or predators using benign means including hand removal and hose washing of bivalves in a manner that minimizes environmental impacts from the discharge of fouling organisms and sediment is allowed.
- (h) Bivalve growing facilities:
- (1) Bivalves may be grown in integrated production systems with other organically raised aquatic animals, such as finfish
 - (2) Bivalve growing areas must be geographically defined. The farm must have exclusive rights to manage and harvest bivalves in each defined area. Bivalves grown on public grounds that are not leased for private use cannot be certified organic.
 - (3) Bivalves may be grown on the substrate, or in off-bottom containers, including bags on racks, lantern nets, trays, or on long-lines, poles or other bags or containers which employ off-bottom methods. Rafts and other floating structures for suspending bivalves in the water column may be employed.
 - (4) Structures used for raising bivalves may not contain lumber treated with arsenate or other synthetic anti-foulants or preservatives, or any non-synthetic substances prohibited under 205.604, except as provided in 205.603.
 - (5) Burrowing bivalves such as clams may be grown in the substrate.

- (6) Farms that grow bivalves must include in their organic system plan specific and measurable steps that will be taken to minimize environmental impacts of farm practices. Such steps may include but are not limited to:
 - i. minimize disturbance of the benthic sediments during seeding of subtidal leases by using only shallow draft vessels during high tide.
 - ii. minimize disturbance of the benthic sediments during harvest of subtidal leases by using only shallow draft vessels during high tide.
 - iii. subtidal leases with fine bottom sediments must be harvested with the least disruptive mechanical or manual harvesting method that are practicable.
 - (7) The seafloor of non-private growing areas cannot be altered with dikes, or leveling.
- (i) Harvesting bivalve shellfish:
- (1) Harvest methods must cause minimal short term impact to the substrate, benthos, and to organisms that live on the ocean bottom and in bottom sediments. Impacts must be minimal to assure sustainability of habitat. Where possible, mitigation measures must be employed.
 - (2) For all methods of harvest the organic system plan must include an assessment of the potential for incidental kill of non-farmed species that occupy the farming habitat and a plan to minimize the occurrence of such incidental kill
 - (3) Manual harvest of bivalves by SCUBA divers is permitted. SCUBA and other diving activities within the United States must comply with either State or Federal regulations, whichever is applicable. SCUBA activities in foreign jurisdictions must comply with pertinent SCUBA diving regulations established by the United States Occupational Safety and Health Administration.
 - (4) The sediment plume created during subtidal harvest operations cannot extend further than 100 meters from the boundary of the certified growing area. The plume created shall be defined by a decrease in visibility in the vertical water column by 50%.
 - (5) Dredges or other mechanical methods employed to harvest subtidal bivalves must scrape farmed animals from the benthic surface and minimize penetration into the substrate to no more than the depth of the market sized bivalves being harvested. Sediment penetration must only be by a harvesting bar, blade or tooth, with the body of the dredge held off the bottom by sled runners or other apparatus that does not penetrate the substrate.
 - (6) The use of hydraulic water jets for subtidal harvesting is prohibited. Use of hydraulic water jets for intertidal harvesting of Geoduck clams is allowed.
 - (7) Equipment for harvesting non-burrowing sea-floor-surface dwelling bivalves that creates a negative water pressure above the substrate to sweep the animals into the dredge without the dredge penetrating the substrate is allowed. With this design of dredge, the equipment must held off the bottom by sled runners or other apparatus that does not penetrate the substrate.
 - (8) The organic system plan must include a description of the design of dredges and other harvest equipment employed including drawings or photographs.

- (9) Clams and other burrowing molluscs that grow in the substrate in intertidal areas may be hand dug with particular care to minimize disruption of the seabed. Harvest must occur during periods of beach exposure at low tide to minimize the distribution of marine sediments.
 - (10) Intertidal harvest of clams or other substrate dwelling shellfish may be accomplished with tractor driven harvesting machines. Mechanical harvesting equipment must be designed and operated to minimize disturbance of the substrate through the use of low weight equipment with low pressure tires that are designed to minimize loading on the substrate. This equipment must be driven by a four wheel drive tractor with a total weight of the tractor and equipment of less than 3,000 pounds including the weight of operators. In no case shall substrate loadings exceed 10 pounds per square inch for any tire on the tractor or equipment. This calculation shall be made in the field by dividing the weight of the harvester carried by each tire by the horizontal contact area of the tire on the substrate determined by multiplying the contact width by the contact length of the tire impression in the substrate. Tracked crawler equipment meeting these specifications also may be employed.
 - (11) Raking of clams is prohibited.
- (j) Handling and transport of bivalve molluscs:
- (1) All national and local regulations controlling the disposal of processing wastewater must be obeyed.
 - (2) During shucking, exposure to fresh water shall not exceed 20 minutes.
 - (3) Packing materials and controls must conform to NSSP requirements throughout shipping, distribution, and in retail outlets.
 - (4) Packing date must be clearly marked on the retail sales container as well as estimated shelf-life or “sell by” and the product must conform to local, state or federal standards pertinent to shelf-life and quality.
 - (5) Placing bivalves in waters of lower salinity after harvest for purposes of increasing weight or volume (“soaking”) is prohibited. Placing bivalves in waters of greater salinity for purposes of improving taste (“salting”) is allowed with the provision that the lease or facility used for this practice has been under continuous organic management.