CENTER FOR FOOD SAFETY

April 8, 2014

National Organic Standards Board
Attn: Ms. Michelle Arsenault, Special Assistant
1400 Independence Ave. SW, Room 2648-S
Washington, DC 20250

Docket: AMS-NOP-14-0006 (submitted via regulations.gov)

Center for Food Safety Comments to the NOSB

Center for Food Safety (CFS) is a non-profit membership organization that works to protect human health and the environment by curbing the proliferation of harmful food production technologies and by promoting organic and sustainable agriculture. Our membership has rapidly grown to include four hundred and seventy-five thousand people across the country that support organic food and farming, grow organic food, and regularly purchase organic products.

As a public interest organization intent on upholding the integrity of the Organic Foods Production Act (OFPA), CFS hereby submits comments to the National Organic Standards Board on the following issues: limiting synthetics, animal aquaculture, synthetic methionine, confidential business information, GE contamination and seed purity, streptomycin, and research priorities.

Presumption of Limited Synthetics, the Cornerstone of OFPA

> Most consumers believe that absolutely no synthetic substances are used in organic production. For the most part, they are correct and this is the basic tenet of this legislation [OFPA]. There are a few limited exceptions to the no-synthetic rule and the National List is designed to handle these exceptions.[1]

This quote is excerpted from the July 1990 Senate Report, which informed the development of the Organic Foods Production Act of 1990 (OFPA). As the report language affirms, consumers expect that "no synthetics are used in organic production." The Senate concurred that this expectation is the "basic tenet of OFPA," with the caveat that *"a few limited exceptions*" would be allowed through the National List process. In line with

[1] Senate Report 101-357. 1990. "Report of the Committee on Agriculture, Nutrition, and Forestry, United States Senate, to accompany S. 2830 together with Additional and Minority Views." July 6. 101st Congress – 2nd Session.

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Congress' intent, the National Organic Program has operated for over two decades under the presumption that synthetics are intended to "sunset" i.e., be removed from the National List of Approved and Prohibited Substances (NL). With the USDA's approval of the National Organic Program's 2013 Memo on Sunset,[2] the Agency overturned commitment to limit synthetics in organic, without Congressional knowledge or consent and without public notice and opportunity to comment.

OFPA's legislative history illustrates Congress' intent to maintain the integrity of the organic standards by establishing checks and balances within the law itself. Keeping this in mind, Congress created a system under OFPA whereby any and all exceptions to the prohibition of synthetics in organic must be vetted by an independent, stakeholder advisory board — the NOSB. The broad spectrum of interests represented on the Board, coupled with a robust public participation process, helps ensure that the standards "do not get watered down to satisfy the least common denominator"[3] and compromise organic integrity.

As explained by the NOP in a 2010 memorandum:

> The NOSB has the responsibility to review materials in a timely manner. The NOSB is responsible for making a recommendation regarding whether the listing of an exempted material should be **renewed or removed** during the sunset review. In the absence of a recommendation, the NOP will initiate rulemaking to *remove* [emphasis added] the substance from the National List.[4]

In 2013, the new USDA/NOP policy reversed the default to remove synthetic substances from the NL and replaced it with the default to renew. Instead of strengthening procedures to facilitate expeditious removal of synthetics from organic, it now makes it easier for synthetic and non-organic substances to languish on the NL indefinitely. This contravenes the long-standing policy presumption that the reliance on synthetic and non-organic materials will mostly decrease over time. It also facilitates select stakeholder influence by giving individual Subcommittees far too much control over the NL.

Undue influence of USDA officials was repeatedly identified as a critical issue of concern by representatives of the organic community during the development of OFPA. In fact, at one Congressional Subcommittee meeting in particular, *every* agricultural, industry, environmental, and consumer advocate present unanimously opposed giving the USDA

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[2] McEvoy, M. 2013. Memorandum to the National Organic Standards Board (NOSB): "Sunset" Review of the National List of Allowed and Prohibited Substances (National List). September 13. Available at: http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5105095.

[3] Preparation for the 1990 Farm Bill: Hearing Before the S. Commee. On Agric., Nutrition, and Forestry, 101st Cong. 37 344 (1989) (statement of Enid Wonnacott).

[4] McEvoy M. 2010. Memorandum for the Chairperson of the National Organic Standards Board (NOSB): Sunset Review Under the National Organic Program (NOP). March 4. Available at: http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5096552.

Secretary the authority to unilaterally add synthetics to the National List.[5] To prevent this from happening, Congress created the NOSB under OFPA and explicitly gave the Board recommendation authority over adding substances to the NL.

Clearly that Subcommittee and Congress showed remarkable foresight in curtailing USDA's involvement in the NL process, because they felt that the agency would be reticent to limit synthetics in the face of industry pressure. Nearly 24 years later, against the wishes of Congress, USDA has asserted control over the NL by usurping the NOSB's authority in two critical ways. First, the policy overturns the long-standing presumption that each synthetic substance on the NL is slated to be removed after five years, at sunset, unless compelling information exists to retain it on the list. Previously, the NOSB needed a two thirds majority vote to keep a given synthetic substance on the NL. Now, with the implementation of the new policy, the NOSB needs a two third majority vote to remove the substance from the NL. This represents a reversal in the presumption to remove substances from the NL at sunset, thereby diluting the original standard designed to allow a "*few limited exceptions to the no-synthetic rule.*"[6] The upshot of the new policy will be an ongoing increase in the list of synthetics allowed in organic, completely changing Congress' intention for organic and OFPA. It also undermines the expectations of consumers that the organic market is intended to serve.

Secondly, the NOSB's authority has been further usurped by the reformulated Sunset Policy which allows synthetic substances to be renewed without a full Board vote. In deliberately creating a balanced stakeholder Board of 15, Congress did not intend to have only a handful of NOSB stakeholders decide the fate of synthetic substances for the entire NOSB. But, that is exactly what happens with the implementation of the new Sunset Policy. If the Subcommittee which is reviewing a synthetic decides to renew it at Sunset, no further action is taken and the substance is automatically renewed. The full Board does not vote. Thus, Subcommittees, comprised of stakeholders with the greatest expertise and stakes in the outcome of Subcommittee deliberations, can make decisions to renew synthetics on the NL on behalf of the entire NOSB and without their vote or consent. This short-sighted policy undermines the spirit and intent of creating a 15 member, balanced stakeholder board to be the keepers of organic integrity on behalf of the wider organic community. Instead, it allows those with the highest stakes in a given outcome to make decisions on their own behalf, a process that was neither intended by Congress nor by the drafters of OFPA.

Center for Food Safety believes that the new USDA/NOP Sunset Policy violates OFPA because it fails to subject all petitioned substances to a full NOSB vote. Open public debate and careful analysis of data and the full range of organic stakeholder viewpoints is the cornerstone of OFPA, and the prerequisite to allowing synthetics and non-organic substances to be added to the NL. The Sunset process is intended to hold both the

[5] Preparation for the 1990 Farm Bill: Hearing Before S. Subcomm. On Agric. Research and General Legislation, Comm. On Agric., Nutrition, and Forestry, 101st Cong. 344 (1990) (statement of Sen. Daschle).

[6] Senate Report 101-357. 1990.

materials under review, and any decision to relist, to the same rigorous standards that allowed them to be added to the NL through the petition process in the first place. It is also the time when the full NOSB examines all available new information concerning adverse health and environmental effects and the essentiality of the substance in question. What this has meant for the Sunset process is that synthetics are not only subject to a rigorous review prior to relisting, but that they are also recommended with the same two thirds vote as when the NOSB originally added them to the NL.

A two-thirds vote to relist is crucial to maintaining continued public trust in the organic label because it ensures that most key organic sectors concur with the recommendations. It also ensures that the process complies with OFPA and the organic rules. This high bar and level of consensus is what affords the organic review process and the USDA organic seal the high level of integrity that consumers trust and depend upon. It also provides the basis upon which future organic markets will be built.

Center for Food Safety urges NOSB members to request that all Subcommittees bring forward substances destined for sunset before the NOSB for a public debate, analysis and full NOSB vote. We further urge the NOSB to use all avenues available to accomplish this, including:
voting to de-list a substance in Subcommittee and using the petition process to add a five year expiration annotation to listed the material.

In conclusion, we urge the NOSB to work with the USDA/NOP to reinstate the historical, former sunset policy that subjects substances slated for sunset to the same two-thirds majority vote that allowed them on the list in the first place.

Animal Aquaculture Synthetic Materials (Chlorine, Tocopherols, Minerals & Vitamins)

CFS strongly urges the NOSB to deny all petitions to add substances to the National List (NL) for use in organic aquaculture systems, until final regulations are promulgated. It is *the system of aquaculture* that will necessarily inform deliberations about the acceptability of adding a given substance to the NL. In the absence of any knowledge about the *system* within which a substance will be added, approving it for use in organic aquaculture would be an arbitrary and capricious, unlawful NOSB and NOP action.

Evaluating substances within the *system* they are used is key to the NOSB materials review process. Without final regulations in place to govern organic aquaculture, it is impossible for the NOSB to fulfill its duty to meaningfully assess the necessity, essentiality, and environmental and human health impacts of synthetic tocopherols, minerals, and vitamins in fish feed, or chlorine, all of which have been petitioned by the Aquaculture Working Group (AWG). Without knowing which species of fish are being grown, where, or whether the system is open or closed, how can the Board possibly begin to determine the feed requirements? Approving any substances in the absence of a regulatory frame for their use

would be plainly unlawful. We agree with the Subcommittee's position that "the review of aquaculture materials needs to align with NOP's drafting of proposed aquaculture standards."[7] For these reasons, Center for Food Safety urges the NOSB to deny all petitions for materials proposed to be used in organic aquaculture systems until regulations have undergone public review and comment and they have been finalized.

Since the implementation of NOP's new Sunset Policy will make it more difficult to remove materials from the NL or to add annotations, we strongly urge the Board to take extra precautions before voting to allow any new material on the NL.

What Would an Organic Aquaculture System Look Like?

A truly holistic approach of organic system management is needed—from facility siting to fish harvesting—that upholds the principles of organic:

* enhancing biodiversity and biological cycles in and around the facility,

* prohibiting dangerous inputs and outputs,

* supplying nutritious organic feed, preferably from living organisms that inhabit the system,

* facilitating the natural behavior of the fish and mollusks living in the system,

* minimizing releases of nutrients and waste into the surrounding environment, and

* preventing fish escapes into inland waterways and the ocean so as not to adversely affect aquatic ecosystems.

Keeping these organic parameters in mind, not every type of fish farm or species of fish can be certified organic. CFS has been consistent in its response about what is required by OFPA in this regard,[8] which is also consistent with prudent organic policy making.

Open ocean nets and facilities must be prohibited because fish escapes are inevitable, as we have documented in our past comments to the NOSB (see Appendix for an updated Fish Escape Chart).[9] Exposure to toxic pollutants in the marine environment is unpredictable and unpreventable. The presence of artificial radioisotopes—by-products of human-made nuclear reactions—in the ocean environment, particularly since the Fukushima nuclear

[7] National Organic Standards Board. 2011. Proposed Discussion Document: Aquaculture Materials Review Update. September 27. Available at: http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5094402.
[8] Center for Food Safety. 2008. Comments on National Standards Board (NOSB) Livestock Committee Proposed Organic Aquaculture Standard. November 3.; Center for Food Safety. 2008. Comments on Development of Organic Feed Standards for Organic Aquaculture. September 4.
[9] Center for Food Safety. 2012. Comments to the NOSB: Docket AMS-NOP-12-0017. May 3. Available at: http://www.centerforfoodsafety.org/files/cfs-nosb-comments-3-may-2012.pdf.

plant meltdown, means that fish raised in open-ocean facilities may concentrate low levels of radiation in their bone, blood, organs, muscle, and other tissue.[10] Add to this the concentrated feeding and excrement loads in the marine environment, and it becomes clear that such facilities adversely impact local ecosystems and alter the natural feeding behavior of marine life in the vicinity of the facility. This runs counter to the principles of organic and the intent of the Organic Foods Production Act (OFPA).

Farmed fish must be fed only 100% organic feed, the gold standard that OFPA requires for all other certified organic livestock,[11] as reflected in the Organic Rule.[12]

No wild fish meal or oil can be fed to organically farmed fish because it may be contaminated with toxic chemicals and/or radioactive substances. Harvesting wild fish also negatively impacts marine ecosystems because species used for fish meal and oil provide an important food source for marine mammals, birds, and other fish.

Migratory fish such as salmon can never be farmed organically because closed facilities severely inhibit their natural behavior to migrate and spawn in inland waters. Recirculating, closed-loop, inland facilities have the *potential* to be truly organic because inputs and outputs can be managed to ensure minimal impacts on natural ecosystems. These systems are diverse and complex, so their regulation must be carefully crafted and tested to evaluate whether it is possible to manage them in a manner that is consistent with the principles of organic and OFPA before allowing full commercialization.

CFS believes that the best way to move forward with the development of organic aquaculture standards is to first outline the broad parameters of an ideal inland, closed, recirculating organic aquaculture system. It is important to underscore the point that synthetic inputs must not be allowed in organic aquaculture as a way to prop up the organic system. The *organic system itself should be largely self-sustaining, with the use of minimal synthetic additives.* To that end, we suggest that the organic aquaculture standards focus solely on closed systems of production and that the standards address and incorporate the following criteria:[13]

Closed-loop, recirculating, inland aquaculture systems that allow for the routine regulation, monitoring, and control of inputs, outputs, water quality, and fish health and welfare. Escapes of farmed fish into inland waterways or the ocean must be made impossible.

- Facility siting takes into account past uses of the site and nearby local land uses to ensure that toxic runoff from industrial production systems, landfills and other waste

[10] Center for Food Safety has placed all cited studies and other relevant materials in the docket for review, under separate cover.
[11] 7 USC §6509 (c)(1).
[12] 7 CFR §205.237.
[13] These recommended parameters are informed by the aquaculture standards recommended by IFOAM. IFOAM. 2012. The IFOAM Norms for Organic Production and Processing: Section III-B-6: Aquaculture Production Standards. Available at: http://www.ifoam.org/sites/default/files/page/files/ifoam_norms_version_august_2012_with_cover.pdf.

handling and management operations, medical facilities, military operations, farming, and livestock operations is avoided.

Biological diversity and biological cycling within the system and surrounding area should be maintained and enhanced. Any water discharge from the system shall be as clean as or cleaner than when it entered the system. Nutrient flow in water discharge is avoided through recirculation of water and up-cycled through the use of beneficial bacteria and tandem plant growth.

- Fish breeds are bred and reproduced using natural methods (and not genetically engineered or produced using excluded methods under any circumstances). Fish are raised organically from development and fertilization of the egg onward once there is a sufficient quantity of organic breed stock. Exotic or potentially invasive species are excluded from the organic label.

- Nutritional needs are supplied from organic plants, fish, and mollusks within the system with minimal external inputs. Feeding methods encourage natural feeding behavior and minimize losses to the environment.

- Fish are fed 100 percent organic feed, as required for all organic livestock and poultry producers under OFPA. Wild or farmed fish meal and fish oil is prohibited in feed.

- Waste products generated are utilized and incorporated into the aquaculture system, to the extent possible, in order to eliminate the need for waste disposal outside of the system. For those wastes that cannot be avoided, they are composted and otherwise managed in the same way that livestock waste is required to be managed in accordance with the Organic Rules. Waste can be used on farms as fertilizers, provided that run-off is contained and does not reach inland waterways or the ocean.

- Materials such as antibiotics, hormones, growth regulators, genetically engineered inputs, synthetic pesticides and fertilizers, synthetic dyes and colorants, products of nanotechnology or any other substances that are prohibited under OFPA cannot be used in certified organic aquaculture systems, without exception. This includes unapproved drugs or vaccines administered directly to fish or added to feed or the water. Extra-label uses of drugs and experimental drugs also must be prohibited.

- Stocking rates are designed to avoid the problem of overcrowding that is common in conventional, industrial aquaculture systems. The living environment of the system promotes and maintains the health and welfare of the animals in a non-stressful environment that is appropriate to the species, and breed.

Given the newness of this type of technology for organic production, a trial period is needed to test model aquaculture systems and species to ascertain which systems and species can be produced within a biologically diverse and thriving organically-maintained

facility that is consistent with the principles of organic and OFPA. Fundamental public concerns about the types and locations of organic fish farms, which fish are allowed to be farmed organically, and the tenets of organic aquaculture must be addressed before the NOSB votes to approve or deny any petitions for the use of synthetic materials in those systems.

We urge the NOSB to deny any petitions for aquaculture materials before aquaculture regulations are circulated for public review and comment, and finalized. The risks to the organic label and markets are far too great to get it wrong.

In addition to denying the current petitions, we are again urging the NOSB and NOP to reconsider the former Board's recommendation, which allows open ocean facilities and wild fish meal and oil in feed, undermining the 100% organic feed rule. It also recommends the allowance of high-value, migratory salmon to be grown in pens which curtail their natural behavior, favoring organic market expansion at the expense of critical animal welfare and jeopardizing organic integrity. New information about the hazards of growing organic fish in the open ocean, due to the likely exposure to radioactive isotopes from the Fukushima, Japan, disaster[14] make this case for withdrawing the recommendation even more compelling.[15] In addition to contravening public policy, if implemented, the NOSB recommendation is plainly unlawful. It also runs counter to the high organic integrity that the public has come to expect will be upheld by the NOP, USDA, and the organic industry.

"Organic" Fish Imports

Center for Food Safety urges the NOSB to call upon the USDA/NOP to enforce a ban on "organic fish" sold to US retailers. The sale of so-called "organic fish" is rampant throughout the US and it is continuing to spread in restaurants and stores where fish are sold. In the absence of US organic fish standards, the continued sale of "organic fish" only serves to confuse organic consumers and undermines the organic label in the market place even if the fish do not have the US organic seal. Enforcement is an essential element of the US organic program that ensures the integrity of food sold in the US as "organic." WE urge immediate enforcement action to be taken in this regard.

CFS Continues to Oppose Synthetic Methionine in Organic Poultry Feed

Center for Food Safety reiterates its opposition to the methionine proposal put forth by the Livestock Subcommittee in August 2013.[16] We oppose the recommendation that feed rates

[14] Center for Food Safety. 2013. Comments to the NOSB. October 1. Available at: http://www.centerforfoodsafety.org/files/cfs-comments-nosb-oct-2013_37144.pdf.
[15] Center for Food Safety has placed all cited studies and other relevant materials in the docket for review, under separate cover.
[16] Center for Food Safety has previously submitted extensive comments opposing the use of the synthetic methionine in poultry production and we have incorporated those comments by reference here.

are expressed as an average per ton of feed over the life of the flock instead of just per ton of feed. As CFS has explained before, the overall usage of synthetic methionine will not be lowered with the approach laid out in the proposal. On the contrary, overall synthetic methionine use will largely remain the same. Moreover, if this recommendation is implemented, the sunset clock will be reset, allowing methionine to languish on the National List for another 4.5 years. CFS's position remains the same as it was six months ago: NOSB, USDA/NOP, and the poultry industry must come together and develop a research plan for eliminating synthetic methionine use in poultry feed. Center for Food Safety urges the Livestock Subcommittee to deny the petition to extend the use of synthetic methionine in poultry feed and maintain the current sunset date of October 2017.

In place of a research plan, the Livestock Committee continues to support synthetic methionine use and a petition that will allow its use to continue another year longer than its intended sunset. This type of inaction is not consistent with the organic program's continuous improvement model. In order to promote continuous improvement, NOSB and NOP must promote all efforts to research the efficacy and availability of alternative and natural sources of methionine. CFS has conducted some preliminary research, in hopes that NOSB, NOP, and the poultry industry will take the baton and research innovative ways to break the synthetic methionine addiction.

The most promising area of research related to alternative sources of essential amino acids for poultry rearing focuses on insect species as a sustainable protein source. For example, fly maggots from black soldier flies and houseflies—insects that are particularly high in methionine—can be reared on poultry manure and then provided as a feed ingredient. Organic agriculture is a systems approach and this type of integrated system, where a critical portion of feed is living on and helping to compost waste from that system, supports that approach.

Insects are used as a protein source in integrated systems worldwide. Animals are not the only insectivores. Humans also use insects to supplement protein in diet. It is estimated that insects form part of the diets of at least 2 billion people.[17] More than 1900 species have reportedly been used as human food. Insects deliver a host of ecological services, as pollinators in plant reproduction, in improving soil fertility through waste bioconversion, and in natural biocontrol for harmful pest species, and they provide a variety of valuable products for humans, such as honey and milk.[18]

Many agricultural and aquacultural systems are also starting to integrate insects as feed. Available evidence suggests that insect-based feeds are comparable with fishmeal and soy-based feed formulas.[19] For example, one study demonstrated that soldier flies reared on

[17] Van Huis, A. et al. 2013. "Insects as animal feed," in Edible insects: future prospects for food and feed security. United Nations Food and Agriculture Organization. Full report available at: http://www.fao.org/docrep/018/i3253e/i3253e00.pdf.
[18] Van Huis, A. et al. at xiii.
[19] Van Huis, A. et al. at xiv.

manure could replace soy meal in poultry diets.[20] Other studies have shown that silkworm pupae—byproducts of silk manufacturing—can replace fishmeal entirely in laying hens. Grasshoppers and Mormon crickets can also entirely replace fish and soymeal. Flour derived from cockroach and termites could replace meat meal when incorporated into feed.[21] Finally, mealworms raised on low-nutritive waste products provide a high-protein diet for broiler chickens.[22]

Research also shows that magmeal—maggot powder—is superior to vegetable proteins. "Studies conducted through Idaho State University, the University of Georgia, Humboldt University, Ebonyi State University, and Stellenbosch University have shown that magmeal performed better than fishmeal as a protein source for poultry, pork, and aquaculture because it is more nutritious . . . The balance of [the] amino acid profile is good, including sufficient methionine."[23] Production of magmeal commonly involves three species: house flies, black soldier flies, and blow flies. Of these, both house and soldier flies breed well in poultry manure. To make magmeal, maggots are harvested just before the pupal stage, dried by heating, milled to fine, rich, brown powder and packed. In a lifetime, females of these flies lay 300 and 1,200 eggs, and 1kg of eggs can turn into over 300 kg of protein about 72 hours after hatching if sufficient food is available. Five tons of maggots, approximately 200 million, yield one ton of magmeal.

Insect proteins are commonly high in methionine. For example, Yellow Mealworm and Lesser Mealworm Larvae had methionine levels of 2.1% and 2.8% of crude protein, respectively, as compared to 1.4% for soybean meal.[24] Housefly-pup meal "is characterized by a high content of crude protein of 61.4% and…is a good source of essential amino acids, mainly arginine (3.7%), lysine (3.8%) and methionine (1.6%). It is a relatively well-balanced protein source for poultry." If producers add an additional building to layer houses, it is possible to produce, continuously, upgraded manure composed of pupa mixed with manure residue. If heated to 180˚C to be sterilized and dried, it may be used as a feed additive in animal nutrition."[25] Clearly there is significant potential with insect-based proteins.

Natural methionine supplements may also yield good results. Research shows that birds raised on 15g/kg of herbal methionine had greater total body weight and greater weight gain than birds raised on both 10g/kg synthetic methionine and 10g/kg herbal

[20] Ravindran, V. and R. Blair. 1993. Feed resources for poultry production in Asia and the Pacific. *World's Poultry Journal,* 49(3): 219-235.
[21] Mushambany, T. and N. Balezi. 2002. Use of cockroach and termites as potential substitutes of meal meat in broilers feeding in South-Kivu, Democratic Republic of the Congo. *Tropicultura,* 20(1): 10-16.
[22] Ramos-Elorduy, J. et al. 2002. Use of *Tenebrio molitor* (Coleoptera: Tenebrionidae) to recycle organic wastes and as feed for broiler chickens. *Journal of Economic Entomology,* 95(1): 214-220.
[23] Villet, M.H. "Biorecycling with Flies." Rhodes University Department of Zoology & Entomology, South Africa. http://scienceinafrica.com/biotechnology/environmental/biorecycling-flies.
[24] Veldkamp, T. et al. 2012. Insects as a sustainable feed ingredient in pig and poultry diets – a feasibility study. *Wageningen UR Livestock Research*. October.
[25] El Boushy, A.R. 1991. "House-fly pupae as poultry manure converters for animal feed: A review." *Bioresource Technology*, 38(1): 45-49.

methionine.[26] Mortality rates were similar for all diets. Abdominal fat and liver lipid was decreased in the 15g herbal methionine diet. Study suggests that herbal methionine can replace DL-methionine effectively at a rate of 15g/kg for commercial broiler chickens.

These are just some of the innovative ideas that exist to eliminate the use of synthetic methionine in poultry feed. These ideas cannot develop into full blown solutions without the cooperation of NOSB, NOP, and the poultry industry. CFS urges the NOSB to deny the petition for an extension of methionine use and once again urges the greater organic community to develop and implement novel solutions to provide poultry and all omnivores optimal nutritional quality without the use of synthetic amino acids.

Confidential Business Information

Center for Food Safety wholeheartedly supports the recommendation of the Materials Subcommittee to eliminate the provision for confidential business information from the Materials Petition. As aptly put by the Subcommittee, "the importance of transparency of the petition process, the right of the public to fully know the materials included in or on certified organic process, and the potential for an untenable administrative burden of management CBI"[27] is reason enough to not allow CBI claims in petitions to add a substance to the NL.

Yet, the CBI issue has now become more complicated since the adoption of the new USDA/NOP Sunset Policy. We are concerned that a given Subcommittee may renew a substance at Sunset in the absence of sufficient data because information was redacted in the original petition. Under the new Sunset policy, this could be done without the ability of representatives of the full Board to express their reservations since the substance may never come before the full Board for a vote.

Center for Food Safety supports the recommended procedures set forth by the National Organic Coalition (NOC) to ensure that redacted information contained in the original petition is reinstated as presented below:

NOC suggests the following procedure for ensuring that complete information for all materials is reviewed during the sunset process:

Prior to a material undergoing sunset review by NOSB, NOP evaluates the original petition to identify whether it contains information redacted as CBI. If so, NOP:

[26] Chattopadhyay, K., M.K. Mondal, and B. Roy. 2006. Comparative Efficacy of DL-Methionine and Herbal Methionine on Performance of Broiler Chicken. *International Journal of Poultry Science,* 5(11):1034-1039.
[27] NOSB Materials Subcommittee. 2013. Proposal – Confidential Business Information in Petitions. July 23.

a) Sends a notice to the original petitioner requesting redactions be removed; AND[28]
b) Solicits information to fill the data gaps related to the redacted information through notification of the public about the specific information needed.

During Sunset Review, NOP instructs its Technical Reviewer to fill any remaining data gaps related to manufacturing processes by providing information on the range of processes currently used to manufacture the substance and to complete all other types of data gaps created by redactions present during the material's previous review cycle(s).

If the Technical Reviewer is unable to acquire adequate information because the material's sole manufacturer or all of the material's manufacturers have not released the needed information, then the sunset review of the material cannot continue, as per CBI policy.

*If a material's initial petition included redacted CBI, the NOSB Subcommittee responsible for reviewing it **must** recommend review by the entire NOSB, regardless of the Subcommittee's recommended action on the material's listing status. NOC asserts that re-review by the entire Board is necessary because the information about this material is significantly different from that which the Board considered during the material's initial listing.*

If the above conditions cannot be met and the redacted information not obtained, we urge the Subcommittee and Board to oppose relisting during sunset, due to the insufficiency of information available for making an informed decision to remove or renew.

GE Contamination Prevention & Seed Purity

Center for Food Safety appreciates the thoughtful update compiled by the GMO Subcommittee on the complex issue of GE contamination and seed purity. We agree with the authors that the NOSB's role in this discussion, first and foremost, should be how best to address the intertwined issues of GE contamination and organic integrity so that both organic farmers and organic consumers are protected and organic integrity is maintained.

As suggested in the update, issues surrounding GE contamination of organic and seed purity pivot around larger issues of fair farming for all that extend well beyond the purview of the Subcommittee and even the NOP. It is impossible to address issues of seed purity without addressing the larger agricultural context within which organic agriculture operates and organic policy making is situated. As long as the NOP and NOSB fail to successfully engage the applicable USDA agencies and the Secretary of Agriculture on the need to confront GE contamination of organic, there is little else that organic producers can do to prevent contamination beyond the steps they are already taking, plus the few additional steps noted in the update.

[28] The original petitioner may no longer exist; that specific product may not exist; or their product may not be the product of this listing that is widely used at this time, so it is important not to rely entirely on the original petitioner to 'fix' the problem with the original petition.

USDA's notion of "coexistence" or "concurrent cultivation" lies at the heart of the problem. The Agency's so-called "coexistence policy" assumes that all forms of agriculture can be grown across the country, side-by-side, without any of them adversely affecting the others. That simply is not the case when it comes to GE agriculture. Organic and other non-GE farmers know all too well that their crops can become contaminated as pollen and seed drifts miles away from their original planting location. The recent case of an Australian organic farmer who sued his neighbor after he found GE canola growing on his field demonstrates the seriousness of the contamination problem, and it is the tip of the iceberg.[29] Without mandatory GE contamination prevention measures in place, organic and other non-GE farmers face real economic risks but have little recourse to protect their businesses.[30] Prospects of contamination threaten livelihoods, trading partnerships, and the ability of farmers and food producers to confidently supply non-GE markets. Even USDA admits that is the case.[31]

These real-life challenges cannot be solved through "farmer education and collaboration," as has been suggested by USDA in its recent Federal Register notice: "Enhancing Agricultural Coexistence."[32] In the absence of mandatory regulations in place to prevent contamination, organic will continue to suffer losses and those losses are likely to increase over time. Moreover, USDA's current lassez-faire "coexistence" policy, which completely deregulates GE crops and allows GE seeds, pollen, and plants to contaminate our nation's farms without restraint or recourse, exacerbates market problems for organic crop and seed producers and threatens their livelihoods.

As it stands, USDA's "coexistence" policy merely serves to perpetuate contamination. The Agency has demonstrated little concern about how contamination will affect farmers who do not want to grow GE crops or how it will affect markets that forthrightly continue to reject GE food. USDA's latest Federal Register notice[33] detailed how farmers' talking-over-the fence with each other could solve the problem of GE contamination by "educating" one another struck a sour cord within the organic community. It further serves to illustrate how little value USDA places on preventing GE contamination of organic and other non-GE crops. So does the Agency's suggestion that farmers enter into non-binding farmer-neighbor agreements as a way to prevent GE contamination when, realistically, the only way to prevent it is to stop the flow of transgenes at the source.

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[29] Coopes, A. 2014. "Closely-watched GM farm case begins in Australia." *Phys.org.* February 11. Available at: http://phys.org/news/2014-02-closely-watched-gm-farm-case-australia.html.
[30] Food & Water Watch. 2014. Organic Farmers Pay the Price for GMO Contamination. Issue Brief. March. Available at: http://documents.foodandwaterwatch.org/doc/GMO_contamination.pdf.
[31] USDA Advisory Committee on Biotechnology and 21st Century Agriculture. 2012. "Enhancing Coexistence: A Report of the AC21 to the Secretary of Agriculture". November 19. Available at: http://www.usda.gov/documents/ac21_report-enhancing-coexistence.pdf.
[32] USDA. 2013. Enhancing Agricultural Coexistence: Request for Public Comment. *Federal Register*, 78: 213. 65960-65962.
[33] USDA. 2013. Enhancing Agricultural Coexistence: Request for Public Comment.

The organic sector continues to shoulder far more than its fair share of the burden to prevent contamination while USDA repeatedly discounts the problem. As it stands, huge gaps exist in the regulatory framework for GE crop development which allows the commercialization of GE crops even when notable agronomic, environmental, and socioeconomic risks are clearly present. This pitfall has been made abundantly clear with the deregulation of both GE alfalfa and GE sugar beets because their well-known promiscuity has already led to contamination incidents.[34] That is why Center for Food Safety supports the development of a compensation mechanism that allows contaminated farmers to recoup their losses from the transgenic pollution—i.e., the polluter must be liable and pay for damages. This must be the one of the first steps taken to protect organic growers along with mandating the establishment of a national GE Pollution Prevention Plan.

Given this grave context within which organic agriculture is forced to operate, Center for Food Safety believes that it would be inappropriate to implement a universal genetic purity standard at this time for several reasons. First, other routes of GE contamination must be thoroughly explored to determine all the routes of contamination, including drift, handling, transport, etc. Second, we need more data to ascertain the state of seed contamination and the availability of high quality, non-GE and untreated seed and foundation seed for breeding. All of this will inform a comprehensive assessment of the scope and breadth of the contamination problem, including the potential impacts on seed producers, seed savers, and the availability of non-GE seed now and the likelihood of its availability in the future.

The third reason that the time is not ripe to implement an organic seed standard is because issues regarding liability for GE contamination, the mechanisms for compensation, and the social and economic issues that will be included in the compensation package must be determined first. Otherwise, organic seed producers are at risk of being forced to pay all out-of-pocket costs while the transgenic polluter escapes responsibility. A fourth reason not to set a seed purity standard at this time is because it provides a false assurance that the GE contamination issue is being resolved. Yet, this cannot be the case while entire shipments of organic food continue to be rejected around the world, due to unregulated GE contamination in the US.[35] Finally, setting a standard for organic seed purity in the absence of a robust, National GE Contamination Prevention Plan could force organic growers to use non-organic seed just to avoid GE contamination, in violation of one of the basic tenets by OFPA—namely to require the use of organic seed.

Clearly, there is an urgent need to prevent GE contamination of organic to preserve organic markets, integrity, and consumer confidence. We believe that it is the duty of the NOP to work with the appropriate agencies within USDA to ensure that organic is a protected form

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[34] *See CFS* Plaintiffs' Motion for Summary Judgment, *Grant v. Vilsack*, Case No. 1:11-cv-00308 (D.D.C. Sept. 23, 2011) (Dkt. No. 86-1), at 30–33, and evidence cited therein (containing evidence introduced in the sugar beets litigation documenting extensive contamination in the Willamette Valley at distances far greater than 4-miles); Gillam, C. 2013. USDA will not take action in case of GMO alfalfa contamination. *Reuters*. September 17. Available at: http://www.reuters.com/article/2013/09/17/usa-alfalfa-gmo-idUSL2N0HD1SQ20130917.

[35] Greenpeace International & GeneWatch UK. 2014. GM Contamination Register. Available at: http://www.gmcontaminationregister.org.

of agriculture because USDA's mission is to ensure fair farming for all. GE contamination of organic precludes that from happening.

Center for Food Safety congratulates the NOSB for being responsive to public concerns about GE contamination of organic crops and seeds, repeatedly raised in public comments. We are pleased to see the GMO Ad hoc Subcommittee continue to grapple with tough questions in search of solutions by actively soliciting public input. We encourage the NOSB to assert its legally mandated authority, granted under OFPA, to seize this opportunity to communicate the concerns and suggestions made by the wider organic community to the Secretary of Agriculture.

We further urge the NOSB to call upon the NOP take a more proactive role in advocating for GE contamination prevention measures to ensure organic integrity. Until mandatory GE contamination prevention measures are in place that can demonstrate that GE contamination prevention is possible, CFS calls for a moratorium on the approval or deregulation of any new GE crops.

Streptomycin

Center for Food Safety opposes an extension for the use of streptomycin in apple and pear orchards beyond the current expiration date of October 21, 2014. Streptomycin does not meet the review criteria required under OFPA for substances to be added to the National List (NL). In fact it never has, but now the evidence is even stronger to support sunsetting streptomycin once and for all.

In 2011, the Crops Subcommittee determined that streptomycin *failed to satisfy all three review criteria.*[36] Even though the Subcommittee recommended against its extension, the full NOSB voted in 2011 to extend its use until 2014. That decision included an explicit expectation that the industry would work to identify alternatives.[37] Despite the NOSB's clear intent to end its use, the current Crops Subcommittee has recommended yet another extension. What is even more perplexing is the fact that the Subcommittee now decided that streptomycin does satisfy all the materials review criteria, even in the face of mounting evidence about the environmental and health risks of continued spraying in orchards. Subsequently, the Subcommittee has *again* recommended extending the approval, *again* with the caveat that its use should end, saying that they are "committed to the phase out of this material."[38] This type of contradictory policy-making does little to bolster consumer confidence in the National Organic Program or the organic label.

[36] NOSB. 2011. Formal Recommendation by the NOSB to the NOP: Streptomycin Sunset. April 29.
[37] NOSB. 2011. Formal Recommendation by the NOSB to the NOP: Streptomycin Sunset.
[38] NOSB Crops Subcommittee. 2013. Petitioned Material Checklist: Streptomycin. August 6, Reviewed and Revised February 18, 2014. Page 3.

Streptomycin Must Be Phased Out Now

Streptomycin use in organic orchards should not be extended because it is incompatible with organic systems and because it poses unnecessary threats to human health. The use of streptomycin contravenes the NOSB's stated Principles of Organic, which emphasize promoting and enhancing "biological cycles" and "the use of cultural, biological, and mechanical methods, as opposed to using synthetic materials."[39] The risks of using streptomycin are even clearer than those from using tetracycline, which the NOSB voted to allow to sunset at its April 2013 meeting. Scientists have shown that the mechanism for streptomycin resistance in fire blight is directly applicable to human pathogens, meaning that the same gene gives both types of bacteria resistance. Fire blight resistance to streptomycin is also already widespread in orchards, so this resistance gene is present as a result of spraying. These two details are less clear for tetracycline. With the phase out of tetracycline scheduled for October 2014, it is especially important to maintain consistency by not extending the allowance for streptomycin. If streptomycin use is permitted beyond October 2014, some growers in areas without streptomycin resistance could turn to using it instead of tetracycline for fire blight control, enhancing resistance opportunities and streptomycin use.

The Crops Subcommittee acknowledged the differences between tetracycline and streptomycin by including a section in their report describing the contrasts. The points raised emphasized that the adverse impacts of streptomycin are even stronger than tetracycline.[40] Given the extensive debate at the April 2013 NOSB meeting that led to a vote to phase out tetracycline, it is clear that the NOSB agrees that antibiotics do not belong in organic and it should phase out the use of streptomycin as well. Organic systems should not be furthering the non-essential use of this important antibiotic.

Antibiotic Resistance Develops and Spreads

The use of streptomycin is inconsistent with organic principles and practices, predominantly because it inevitably contributes to incidences of antibiotic resistance in bacterial populations.[41] Streptomycin resistance to fire blight is widespread in orchards where it has been used, rendering it ineffective in those locations. Its impacts are long-lasting as well, as resistance has been detected in orchards up to ten years after the spraying has stopped.[42]

Resistance to streptomycin can occur either as a random mutation or as acquired resistance from another bacterium.[43] Horizontal gene transfer -- a process by which bacteria can pass on plasmids or other traits that confer resistance to one another -- allows for resistance that develops in orchards to move out into the wider bacterial population.[44]

[39] NOSB. 2011. NOSB Principles of Organic Production and Handling. October 17.
[40] NOSB Crops Subcommittee. 2013. Petitioned Material Checklist: Streptomycin. Page 7.
[41] NOP. 2011. Technical Evaluation Report: Streptomycin – Crops. March 8. Lines 429-431.
[42] NOSB Crops Subcommittee. 2013. Petitioned Material Checklist: Streptomycin. Page 7.
[43] NOSB Crops Subcommittee. 2013. Petitioned Material Checklist: Streptomycin. Page 7.
[44] NOSB Crops Subcommittee. 2013. Petitioned Material Checklist: Streptomycin. Page 6.

It occurs readily between various species of bacteria and is the primary means by which antibiotic resistance is spread. This mechanism means that *any* use of antibiotics contributes to the pool of resistance by selecting for resistance and then allowing it to move between different bacteria. When bacteria are exposed to antibiotics, susceptible bacteria die and those with resistance survive and increase their incidence of conjugation (gene transfer) with other bacteria, enhancing the spread of antibiotic resistance. For this reason, infectious disease experts worldwide have called for an end to any unnecessary uses of antibiotics to retain their effectiveness in treating human diseases.[45]

Resistance to streptomycin has already been identified in the fire blight pathogen, *Erwinia amylovora*, in many orchards, including plasmid-borne resistance across the U.S.[46] Genes carried on a plasmid are very susceptible to horizontal gene transfer between bacterial species. Several researchers have documented how streptomycin resistance spreads through bacteria, contributing to our certainty that resistance can spread from orchards.[47] Use of streptomycin is likely to result in a greater diversity of mobile resistance genes in orchards that can be transferred amongst bacteria.[48] This means that there are more genes available to other bacteria, and potentially pathogens, that confer resistance to streptomycin.

Antibiotic Resistance Negatively Impacts Human Health

Antibiotic resistance has been identified as a major human health concern by many health-based organizations, including the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO).[49]

The CDC recently issued a report on antibiotic resistance, stating that its purpose is "to increase awareness of the threat that antibiotic resistance poses and to encourage immediate action to address the threat."[50] Unnecessary uses of antibiotics in all sectors contribute to the development of antibiotic resistance. Since streptomycin is considered a critically important antimicrobial for treating human infections, it is vital to curtail non-therapeutic uses of this drug.[51] Organic operations absolutely should not be contributing to the development of antibiotic resistance and the loss of effectiveness of this important medical tool in any way.

The plasmid genes for resistance to streptomycin in the fire blight pathogen, *Erwinia amylovora*, are the same as the genes that cause antibiotic resistance in many human

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[45] Infectious Diseases Society of America. "Antimicrobial Resistance." Available at: http://www.idsociety.org/AR_Policy/.
[46] NOSB Crops Subcommittee. 2013. Petitioned Material Checklist: Streptomycin. Page 4.
[47] NOSB Crops Subcommittee. 2013. Petitioned Material Checklist: Streptomycin. Page 6.
[48] Yashiro E & PS McManus. 2012. Effect of Streptomycin Treatment on Bacterial Community Structure in the Apple Phyllosphere. *PLoS ONE* 7(5): e37131.
[49] Centers for Disease Control and Prevention. 2013. Antibiotic Resistance Threats in the United States, 2013.; World Health Organization. 2011. Critically Important Antimicrobials for Human Medicine: 3rd Revision.
[50] Centers for Disease Control and Prevention. 2013. Page 6.
[51] World Health Organization. 2011.

pathogens.[52] Thus, development of resistance within an ecosystem can and does contribute to resistance in human pathogens. This critical link in our knowledge of how streptomycin use can affect resistance among human pathogens is acknowledged in the Crops Subcommittee report.[53] Horizontal gene transfer between unrelated bacteria can pass resistant genes between orchard species and human pathogens or simply create a reservoir of resistance in the environment that can later be passed on to pathogenic species. There are a number of mechanisms that can move microbes out of the orchards and into human communities, including dust on fruit, airborne dust, and dirt on workers' shoes.[54] These clear linkages between orchard microbes and human pathogenic communities exist, even when they are not directly exposed to antibiotics.

Streptomycin Impacts Soil Microbial Ecosystems

Spraying antibiotics in orchards may disrupt the microbial ecology of soils and agroecosystems, which runs contrary to organic's mandate to 'maintain or improve' ecosystems and build healthy soil.[55] The bioavailabilty of streptomycin in any given location will vary depending on local environmental factors including physical soil type, nutrient availability, and others.[56] Therefore, streptomycin may have a stronger effect or be more persistent in certain areas than others. In several laboratory studies, streptomycin was found to have negative effects on microbial ecology ranging from inhibiting nitrification to significant reductions in total bacterial count and the elimination of several bacterial species.[57] While this suggests that streptomycin use in orchards could have a negative effect on the microbial ecology of soil systems, no field studies have yet confirmed this finding.[58]

Streptomycin is moderately persistent and highly mobile in aerobic soils, so its biological activity can continue to impact soils after spraying has occurred.[59] Streptomycin is a strong algicide and is labeled to prevent application to water bodies.[60] However, algae may be present in soils and streptomycin is vulnerable to leaching, so it could impact nearby water bodies from orchard use.[61] These potential effects from use of streptomycin in orchards are incompatible with the philosophy that underpins organic systems, namely to build soil fertility and biodiversity.

[52] NOSB Crops Subcommittee. 2013. Petitioned Material Checklist: Streptomycin. Page 7.
[53] NOSB Crops Subcommittee. 2013. Petitioned Material Checklist: Streptomycin. Page 7.
[54] NOSB Crops Subcommittee. 2013. Petitioned Material Proposal: Oxytetracycline, Majority Position. February 5.
[55] 7 CFR 205.200
[56] NOP. 2011. Lines 371-373.
[57] NOP. 2011. Lines 375-398.
[58] NOP. 2011. Lines 404-409.
[59] NOP. 2011. Lines 223-225.
[60] NOP. 2011. Lines 294-295.
[61] NOP. 2011. Lines 225; 294-299.

Alternative Management Techniques Exist

Phasing out streptomycin will remove only one of the available tools farmers can use to manage fire blight. The severity of fire blight varies in different years and regions depending upon weather patterns, rain, and humidity; thus requiring a range of techniques for control. No one tool, including antibiotics, can fully control it. With widespread resistance to streptomycin already present in orchards, growers have already had to find alternative controls. Combinations of techniques, including biological controls, limiting soil moisture and the use of manure, pruning, thinning orchards, and planting new orchards with wider tree spacing and disease-resistant varieties can be utilized to manage fire blight damage.[62]

New biological control products are also entering the market place. While some growers reported mixed success with Blossom Protect during the 2013 growing season, apparently this was due to an unusually warm season in those regions, which increases the activity of fire blight. Unusually harsh weather conditions in a given year will impact crops with different disease pressures and possibly curtail yields. But, any one control strategy should not be dismissed in light of a particularly challenging growing season. The most effective alternative controls require an integrated approach including cultural practices, attention to fire blight prediction models, and alternative biological control products.

One clear example of the success of alternative management techniques is demonstrated in orchards that produce fruit without using antibiotics. There are a number of US orchards that supply organic markets (such as the European Union and Canada) that prohibit the use of antibiotics. These orchards have been successful in mitigating fire blight damage, proving that alternative control techniques can be effective in the absence of antibiotics.[63] This information must be documented and circulated to organic and pear growers across the country to aid them in the control of fire blight. The Organic Center has produced a report on techniques for controlling fire blight without antibiotics that can serve as a grower resource for orchards transitioning away from antibiotic use.[64] Once all organic growers cease using antibiotics, they will have the added advantage of accessing those international markets as well.

Consumers Do Not Expect Antibiotic Use in Organic

<u>Consumers do not expect antibiotic use in any sector of organic production, especially given the clear and widely marketed prohibition of their use in livestock rearing.</u> Consumers choose to buy certified organic food because they want to support systems of production that protect and enhance human health and the environment. They also expect their organic food to be grown without the use of antibiotics, growth hormones, genetically

[62] NOP. 2011. Lines 601-617.
[63] NOP. 2011. Lines 671-701.
[64] Ostenson, H. and D. Granatstein. 2013. Grower Lessons and Emerging Research for Developing an Integrated Non-Antibiotic Fire Blight Control Program in Organic Fruit. *The Organic Center*. Available at: http://organic-center.org/wp-content/uploads/2013/07/TOC_Report_Blight_2b.pdf.

engineered organisms, and synthetic herbicides and pesticides.[65] Continuing to allow streptomycin, which has even clearer adverse impacts than tetracycline, will only cause confusion and disillusionment among consumers when they learn that their tree fruit is still being treated with antibiotics. Consumers have made it clear that they do not support the continued use of antibiotics in organic tree fruit, with 30,498 signatories to our 2013 petition on the public record calling for NOSB to oppose another extension to the sunset date for streptomycin.[66]

In addition to concerns about antibiotic resistance development, residues of streptomycin have been identified on treated fruit.[67] This represents an added concern for consumers that even goes beyond the concerns they already had about the use of tetracycline in orchards, because tetracycline residues have not yet been found in fruit from those orchards. The highest concentrations of streptomycin were found in the apple core and skin. Although the residues identified are below EPA limits, organic consumers do not expect *any* residues of antibiotics in the organic fruit they buy.[68]

In order to maintain the integrity of the organic label and its unique position in the marketplace, the NOSB must not extend the use of streptomycin. A strong commitment from the NOSB to uphold the October 2014 expiration date would send a meaningful signal to organic consumers that the NOSB is committed to continual improvement, as per the regulatory charge of the National Organic Program.[69] We strongly urge the NOSB to reject an extension for the use of streptomycin in apple and pear orchards and vote to eliminate the use of antibiotics in organic once and for all.

Research Priorities

CFS appreciates the work of the Materials Subcommittee to identify priority areas for organic research. We are in agreement on most of the research priorities, and offer the following comments.

Whole Farm Systems

Research focusing on whole farm systems is crucial to furthering the ability of organic farmers to integrate a variety of management practices across various aspects of their farm operations. This type of research is particularly important because the majority of agricultural research focuses solely on isolated or individual parts of the farming system instead of striving to develop holistic management approaches. Prioritizing research that examines many facets of organic systems to identify synergistic techniques will help

[65] Organic Trade Association. 2011. U.S. Families' Organic Attitudes & Beliefs, 2011 Tracking Study. Page 13.
[66] Please see the text of our petition, attached as Appendix A and submitted to the public record docket with our October 2013 comments.
[67] Mayerhofer G. et al. 2009. Detecting streptomycin in apples from orchards treated for fire blight. *Journal of Antimicrobial Chemotherapy* 63(5): 1076-1077.
[68] NOP. 2011. Lines 242-244.
[69] 7 CFR §205.200.

continue to advance organic production. Many of the other research priorities mentioned in this paper would also benefit from research focused on a systems-based approach.

Whole farm systems research should continue to emphasize the role of biodiversity in maintaining the functioning of thriving organic systems. According to the Wild Farm Alliance, "biodiversity conservation is part of the definition of organic farming, and the NOP requires that operators (farmers, ranchers, wild crop harvesters, and handlers) maintain or improve their soil, water, wetlands, woodlands, and wildlife."[70] Biodiversity is especially crucial for pest management and to combat disease resistance, as outlined by the Wild Farm Alliance in their Biodiversity Checklist. Since biodiversity enhancement is required under OFPA, more research in this area would benefit new and existing farmers by helping them to meet this requirement.

Alternatives to Antibiotics for Fire Blight

CFS concurs that researching alternatives to antibiotics as a way to manage fire blight is a high priority for organic apple and pear growers. Given the NOSB's recommendation to phase-out of the use of tetracycline and the likelihood that streptomycin will soon also be removed from the NL, all points raised in the research proposals are high priorities. They should be approached with systems-based research to identify holistic management strategies that combine a range of fire blight control tactics. Given the challenges associated with implementing alternative control measures, Center for Food Safety recommends adding the following research priorities to the Materials Subcommittee's list of research priorities for fire blight control:

1. Methods to increase the accuracy of monitoring for the presence of fire blight;
2. Systems-based approaches to preventing and controlling fire blight;
3. Field trials to determine efficacy of using new materials on existing organic and pear farms with minimal, moderate, and severe fire blight problems.

Methionine Alternatives

CFS agrees with the Materials Subcommittee that finding alternatives to synthetic methionine is a high priority. In addition to the research topics suggested by the Subcommittee, the following topics have been mentioned by public commenters to assist in providing natural sources of methionine to omnivorous livestock:

1. High-methionine corn;
2. Practical implementation of systems for insect-based diets;
3. Using black soldier flies and other high methionine insects as a methionine source in poultry rations; and
4. Natural methionine supplements.

[70] Wild Farm Alliance. 2013. "Organic & Biodiversity News." Available at: http://www.wildfarmalliance.org/resources/organic_BD.htm.

Organic Aquaculture

CFS has consistently noted the complexity of the debate surrounding allowing different types of aquaculture production systems under the NOP's jurisdiction. Many outstanding questions remain unanswered regarding the type and location of such systems the types of species that would be allowed before the development of an organic aquaculture system can proceed, etc. (see CFS's aforementioned comments in this submission for greater details).

We strongly agree with the Materials Subcommittee that more research is needed for organic aquaculture to become a reality. Any discussion of aquaculture materials is inappropriate until the specific systems within which organic aquaculture would operate are described and evaluated and unless and until clear evidence exists to demonstrate that aquaculture does indeed fit within organic principles.

Biodegradable Biobased Mulch

CFS suggests that the Materials Subcommittee add Biodegradable Biobased Mulch to the list of "Topics for Future Review." On August 22, 2013, NOP published a proposed rule that discusses the addition of Biodegradable Biobased Mulch to the National List (see CFS's detailed comments on the proposed rule).[71] NOSB's prior consideration of this material showed that more information is needed to be able to answer questions related to the effects of these materials on soil chemistry and soil organisms, as well as how degradation is affected by a range of environmental factors. It is clear that ongoing research on biodegradation of these projects should be supported and considered as the NOP evaluates the material and moves through the rulemaking process because completed research has not shown full degradation.

Consumer Demand and Other Economic Issues

Although economic impacts are not issues that OFPA requires the NOSB to consider in its evaluation of materials, we understand that the NOP must give economic justifications for its actions to the Office of Management and Budget in implementing NOSB recommendations. Compatibility with organic production also includes meeting consumer expectations. The "consumer demand" topic, as described in the Materials Subcommittee, inappropriately questions the motives of consumers and consumer advocates. Since organic is structured as a marketing program, meeting consumer expectations is at the core of the program's success. In addition, consumer advocates play a critical role in providing public input into organic policymaking discussions, advocating on behalf of their constituencies, and keeping the general public apprised of the latest developments in organic.

[71] Center for Food Safety. 2013. Comments on Biodegradable Bioplastic Mulch Film Draft Rule. October 21. Available at: http://www.centerforfoodsafety.org/files/cfs-mulch-comments-102013_35610.pdf.

Some issues that arose in the discussion of antibiotics warrant additional market research. Although some items specifically refer to apples, pears, and antibiotics, more general research is needed as well on impacts on growers, distributors, processors, and retailers. Such assessments should focus on:

1. Impacts within the organic marketplace such as shifts in sourcing tree fruits (e.g. more overseas, less domestic);
2. Patterns of certification of tree fruit acreage;
3. Market research on consumer acceptance of alternative tree fruit varieties that are resistant to fire blight;
4. Impacts in the organic marketplace of a loss of trust in organic integrity; and
5. An assessment of the appropriate data needed to more accurately measure consumer preference and expectations.

Reduction of Genetically Modified Content of Breeding Lines

Significant research is necessary to address GE contamination, which is not just limited to GE content in breeding lines. See comments of the Organic Seed Alliance which outlines in detail why a singular focus on "purification" of breeding lines is not sufficient.

The GE contamination question should be more accurately stated as: *"What techniques can be applied to prevent or eliminate contamination by GE crops and seeds in organic production?"* Unless USDA, which is the lead government agency responsible for advancing fair farming for all, deliberately and conscientiously undertakes GE contamination prevention for all of US agriculture, conversations focusing solely on what organic producers can or should do will have little meaning (see CFS's aforementioned comments on this issue in this submission).

It is the duty of NOSB to continue to advise the Secretary of the seriousness of the full range of contamination problems with respect to organic and to request research that documents its presence. In addition, research is needed regarding the specific techniques owners and users of the GE technology can use to prevent contamination of organic (as well as other non-GE agriculture).

Even though the USDA/NOP continues to advise the NOSB that GE contamination is outside of its purview, we continue to respectfully disagree. It is the duty and responsibility of the NOSB to protect the rights of farmers to practice organic agriculture, and GE contamination infringes upon those rights to such an extent that the NOSB cannot remain silent on the issue.

Thank you for your consideration of our comments.

Respectfully submitted by:

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Appendix

Fish Escapes from Aquaculture Facilities

Fish escapes from aquaculture facilities are not isolated occurrences. Even in a single year a given company will likely experience multiple fish escapes at its facility. Marine Harvest, for example, operates multiple facilities in Scotland and it reported 33 escapes within a ten-year period, resulting in a total 290,345 escaped Atlantic salmon. In that same ten-year period, Kames Fish Farming had 11 escapes, resulting in 32,790 halibut, rainbow trout, and Atlantic salmon being unintentionally released into the marine environment. While these companies have attempted to correct their containment measures after each event, it is clear from their experiences that escapes are exceedingly difficult if not impossible to prevent. This is especially evident considering the variety of causes of the escapes that have been reported, including human error, extreme weather, and predator attacks. In some cases, holes are discovered in nets due to unknown causes and the numbers of fish escapes remain undocumented and unknown.

Compared to other fish-farming countries—Canada, Norway, the United States—Scotland is unique in its commitment to comprehensively collect detailed information on reported escapes and make those figures publicly available. The Scottish Government provides an annual list of escapes that includes the date, location, company, number, species, and cause of each event that occurred each calendar year. The data is based upon the fact that facilities are required to closely monitor their stocks and file detailed reports with the government for each escape. Therefore, it is highly unlikely that Scotland's escape figures are outside the norm and rather that escapes in other countries continue to go undocumented.

The Scottish Government requires that all fish farms report any suspected or confirmed escapes in writing to the Scottish Ministers immediately. Failure to do so may result in a recorded offense. In addition, farms are required to submit follow-up notifications within 28 days of the event to provide final figures and information regarding the escape.[72] The mechanisms for reporting are clearly defined and universal for all farms operating in Scotland. In contrast, aquaculture in the United States is less centrally regulated. Permitted aquaculture facilities in Maine, for example, are required to develop a containment management system (CMS). The Maine Department of Marine Resources (DMR) provides general guidelines, but otherwise the details of a facility's escape prevention and response procedures are developed internally by the company. Once designed, a farm's CMS is audited by the agency only once a year or within 30 days of a reportable escape.

Compounding the issues inherent in self-regulation, a reportable escape is defined by DMR as consisting of "25% or more of a cage population and/or more than 50 fish with an

[72] Marine Scotland. 2012. "What to do in the event of an escape of fish from a fish farm." Available at: http://www.scotland.gov.uk/Resource/0040/00403925.pdf.

average weight of two kg each."[73] Washington state, the U.S.' other primary finfish producer, has similar biomass thresholds for reporting fish escapes.[74] The allowance for self-reporting coupled with threshold requirements likely means that fish escapes consistently go undocumented.

[73] Maine Department of Marine Resources. 2012. "Application for a Standard Aquaculture Lease: Net Pen Aquaculture Discharge." Available at: http://www.maine.gov/dmr/aquaculture/documents/netpenapplication.pdf.
[74] Personal Communication. 9/3/2013. John Kerwin, Fish Health Manager, Washington State Department of Fish and Widlife.

CENTER FOR FOOD SAFETY

TABLE I: ANNUAL FISH FARM ESCAPES BY SPECIES AND COUNTRY*

YEAR	COUNTRY	SPECIES	# OF ESCAPES
2014	Norway	Atlantic Salmon	120,000[1]
2014	Scotland	Atlantic Salmon	150,000+[2]
2013	Scotland	Rainbow Trout	7,442[3]
2013	Scotland	Atlantic Salmon	25,532[4]
2012	Canada	Salmon	2,753[5]
2012	United States	Salmon	7 Fish of aquaculture origin found in Maine rivers[6]
2012	Scotland	Atlantic Salmon	37,523[7]
2012	Scotland	Rainbow Trout	3,434[8]
2011	Canada	Steelhead Trout	12,382[9]
2011	Canada	Atlantic Salmon	12[10]
2011	Scotland	Rainbow Trout	12,820[11]
2011	Scotland	Atlantic Salmon	403,634[12]
2011	United States	Salmon	3 Fish of aquaculture origin found in Maine rivers[13]
2010	Scotland	Rainbow Trout	19,976[14]
2010	Scotland	Atlantic Salmon	117,987[15]
2010	Canada	Atlantic Salmon	184,000[16]
2010	Norway	Salmon	252,000[17]
2009	United States	Yellowtail	Unknown # of escapes after shark attacked cage nets[18]
2009	Canada	Atlantic Salmon	48,857[19]
2009	Scotland	Rainbow Trout	8,591[20]
2009	Scotland	Atlantic Salmon	132,051[21]
2008-2009	Chile	Salmon & Trout	700,000+; Multiple farms[22]
2001-2009	Norway	Rainbow Trout	980,000 (110,000 per year)[23]
2001-2009	Norway	Atlantic Cod	1,050,000 (175,000 per year)[24]
2001-2009	Norway	Atlantic Salmon	3,930,000 (436,000 per year)[25]
2008	Canada	Atlantic Salmon	111,769[26]
2008	Scotland	Salmon	58,641[27]
2007	United States	Yellowtail	1,500; Cage left open[28]
2007	Scotland	Atlantic Salmon	154,466[29]
2007	Scotland	Rainbow Trout	56,151[30]
2007	Canada	Salmon	19,246[31]
2007	Chile	Salmon	12,000,000; Occurred during earthquake[32]
2006	Scotland	Salmon	157,000[33]
2005	Scotland	Salmon	1,000,000+; Severe storm[34]
2005	United States	Atlantic Salmon	2,500[35]
2004	United States	Atlantic Salmon	24,552[36]
2004	Canada	Atlantic Salmon	43,969[37]
2004	Chile	Salmon	1,000,000[38]
2003	United States	Atlantic Salmon	2,000[39]
2002	Scotland	Salmon	200,000[40]
2002	Canada	Atlantic Salmon	11,257[41]

*Actual figures are likely to be higher as fish escapes may go unreported for various reasons, including: threshold requirements for reporting, reports of holes found in nets with escapes unknown, leakages of small numbers of small fish, severe weather conditions, etc.

TABLE 1 (CONT.)

YEAR	COUNTRY	SPECIES	# OF ESCAPES
2001	Canada	Atlantic Salmon	55,414[42]
2000	Canada	Atlantic Salmon	31,855[43]
2000	United States	Atlantic Salmon	170,000[44]
1999	Canada	Atlantic Salmon	35,954[45]
1999	United States	Atlantic Salmon	115,000[46]
1998	Canada	Atlantic Salmon	80,975[47]
1997	United States	Atlantic Salmon	369,000[48]
1996	United States	Atlantic Salmon	107,000[49]
1996-2014	**World**	**Total**	**At least 24,007,243[50] since 1996**

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[50]Numbers of found fish in this chart are not included in the total escape figure as it cannot be determined whether they were from an unreported escape event or an event already factored into the total.