



# THE CENTER FOR FOOD SAFETY

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National Organic Standards Board  
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**Docket No: AMS-NOP-12-0017; NOP-12-06**

## **Center for Food Safety Comments to the National Organic Standards Board**

The 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 list of True Food Network members has rapidly grown to include over two hundred thousand people across the country that support organic food and farming, grow organic food, and regularly purchase organic products.

Our comments address the following issues: GMOs in organic, GMO vaccines, carrageenan, inerts, conflict of interest, animal welfare, and aquaculture.

### **Ad Hoc GMO Committee—Letter to Secretary on GMOs**

The Center for Food Safety is pleased to see the National Organic Standards Board (NOSB) asserting its authority to directly communicate to U.S. Department of Agriculture (USDA) Secretary, Vilsack, with respect to serious public concerns raised to the Board about GMO contamination of organic. We fully support the Board's letter to the Secretary which emphasizes that "the USDA's actions to date on genetically engineered crops have been insufficient to protect the organic industry."

CFS counts itself among the many groups and individuals who have been repeatedly raising concerns about GMO contamination of organic since the institution of the Organic Rule in 2002. While we appreciate the establishment of an NOSB Ad Hoc GMO Committee to help organic producers and handlers avoid contamination across the supply chain, we also strongly believe that GMO technology developers and users must be held accountable to prevent contamination of organic.

No well-established scientific evidence exists to demonstrate that contamination can be prevented when farmers use GMO technology and that 100 percent containment in open air agriculture can be achieved. Yet, scientific evidence does exist that explains how GMOs cannot be recalled once released into the environment.<sup>1</sup> This is troubling news for organic farmers. Without USDA imposed restrictions and limitations on GMOs, organic growers remain largely unprotected from contamination by GMO crops that have been deregulated and commercially grown. This lack of protection ensues even despite the good faith efforts of farmers, and the associated expenses they incur to protect the organic integrity of their crops. Moreover, because USDA has never mandated restrictions on any GMO crop, there is little empirical evidence to demonstrate how best to prevent contamination. Although we also strongly agree with the Committee's assessment that "the responsibility to prevent GMO contamination of organics is shared by those who develop, use, and regulate this technology," we believe that USDA's policy of allowing unrestricted GMO deregulation makes it nearly impossible to prevent GMO contamination of non-GMO crops and seed.

The organic food industry already shoulders a large and unfair burden to prevent contamination from a technology that provides them with no benefits and only costs. It is time for the USDA to step up to the plate and require those who profit from GMOs to demonstrate how contamination prevention is possible, and to require it. This includes instituting a moratorium on the approval and planting of new GMO crops, unless and until GMO contamination is prevented through mandatory regulatory measures. It would help ensure that those who choose to *not* use GMO technology can freely do so without the threat of contamination or suffering market and livelihood losses. For crops already in unrestricted commercial production, it is incumbent upon USDA to assess where contamination occurs, require restrictions, and assign liability to the GMO patent holder. In the interim, USDA should also determine the best management practices to mitigate GMO contamination and the associated economic harms to organic growers. Such efforts would go a long way in assuring organic consumers that the government is receptive to their desire to eat organic food, free from GMO contaminants.

As the Ad Hoc Committee's letter aptly points out, "USDA actions are critical to the integrity of the organic seal and consumer confidence." We urge the NOSB to approve the Committee's letter and send it to the Secretary at the earliest opportunity.

### **Livestock Committee—GMO Vaccines**

CFS does not support the Livestock Committee's draft recommendation as written.

We oppose the use of GMO technology in organic production systems because we believe that the novel and unproven technology is incompatible with organic principles and practices. In the NOP Final Organic Rule, GMO technology is explicitly identified as an

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<sup>1</sup> Marvier, Michelle & Rene C. Van Acker. (2005). "Can Transgenes be kept on a Leash?," *Frontiers in Ecology and the Environment*, 3(2): 96-106.; Altieri, Miguel. A. (2005). "The Myth of Coexistence: Why Transgenic Crops are not Compatible with Agroecologically Based Systems of Production," *Bulletin of Science, Technology & Society*, 25(4): 361-371.

excluded method — a position we strongly support without any caveats. As such, we do not favor the use of GMO vaccines as the exception, even though the Rule allows them to be petitioned for possible inclusion on the National List. Moreover, since the Technical Review (TR) for GMO vaccines (November 2011) demonstrates that non-GMO vaccines are currently available for virtually every known disease for which livestock vaccines are used (see Table 1 in the TR), we believe that GMO vaccines are not essential or compatible with organic livestock production systems.

The apparent trend towards producing GMO vaccines is of great concern to CFS, particularly in the near total absence of any publicly accessible studies to demonstrate that the production, use, and disposal of GMO vaccines and their waste products is safe for humans, animals, and the environment. The TR equates conventional vaccines with GMO vaccines without questioning whether GMOs pose any unique risks or compatibility concerns when considered within the context of organic systems. This represents a major flaw in the methodology used to draw conclusions in the TR. It is also disturbing to see that in the absence of any convincing supporting data, the Livestock Committee still responded “no” to NL criteria questions regarding environmental contamination during manufacture, harmful effects on the environment, biodiversity, human health and animal health, adverse biological and chemical interactions in agriculture ecosystems, etc.

In addition, CFS’s own focused literature search of veterinary medicine, animal science, and welfare journals uncovered scant information about the potential risks associated with using GMO vaccines. This is not because such risks do not exist but because of the lack of research performed and published to date. None of the studies reported results of direct animal field or laboratory experiments or slaughter examinations of animals injected with a GMO vaccine to assess the unique threats GMO vaccines may pose. As this dearth of data suggests, more research is sorely needed on GMO vaccines and drugs before any conclusive health, safety, and efficacy claims can be made. Much of the existing data comes from mice experiments and great care and more research must be undertaken before extrapolating these data to other species such as cows and pigs used for food.

Although vocal critics of GMO vaccines are difficult to find, a doctor from the Singapore Health Sciences Authority’s Center for Drug Administration cautioned that the existing knowledge about GMOs is so inadequate that it is impossible to define either the probability of unintended events or consequences of GMO vaccines. In an article in *Toxicology and Environmental Health*, she cautions:

*Genetically modified (GM) viruses and genetically engineered virus-vector vaccines possess significant unpredictability and a number of inherent harmful potential hazards....Important questions concerning effects on non-targeted individuals within the same species or other species remain unknown. Horizontal transfer of genes, though lacking supportive experimental or epidemiological investigations, is well established. New hybrid virus progenies resulting from genetic recombination between genetically engineered vaccine viruses and their naturally occurring relatives may possess totally unpredictable characteristics with regard to*

*host preferences and disease-causing potentials. Furthermore, when genetically modified or engineered virus particles break down in the environment, their nuclei acids are released. Appropriate risk management is the key to minimizing any potential risks to humans and environment resulting from the use of these GM vaccines. There is inadequate knowledge to define either the probability of unintended events or the consequences of genetic modifications.<sup>2</sup>*

In terms of the safety and efficacy of new GMO vaccines in food animals, we know from research on non-GMO vaccines shows that different breeds of the same species will react differently to a given vaccine. One of the most concerning issues to researchers is the possibility that injected DNA will actually integrate into the animal's chromosomes inside the cell. The effects can range from no effect at all to a potentially carcinogenic effect through mutation of the normal DNA. Other concerns about GMO vaccines include the possibility of genes controlling cell growth, effects on protein immunogens, the possibility of inducing antibody production against DNA itself, development of tolerance to the antigens produced, and altered processing of bacterial and parasite proteins.<sup>3</sup>

As the Board is acutely aware, organic consumers do not expect GMO technology to be used in organic production systems. Therefore, the very real potential exists for undermining consumer confidence in the organic label if GMO vaccines are allowed, even with emergency restrictions and eventual NOSB review. In fact, the Committee fully acknowledges that "it is clear GMOs are not functionally equivalent in the eyes of the consumer in the organic marketplace and in the legal interpretation of NOP regulations." That is why it is so important that the NOSB proceed cautiously and transparently by taking steps to safeguard organic integrity and organic livestock.

Please see comments submitted by the National Organic Coalition that detail additional questions and concerns regarding how an emergency is declared, who declares it, how long it lasts, etc.

To avoid the situation where a farmer accidentally uses a prohibited GMO vaccine, we urge the NOSB to recommend to the NOP that it compile a list of all available non-GMO vaccines and their use. The list should be published on the NOP website, regularly updated, and made easily accessible to organic farmers and certifiers. We further urge the NOSB to recommend to the NOP that it requests USDA's Animal Plant Health Inspection Service's (APHIS) Center for Veterinary Biologics (CVB) to require GMO vaccine labeling to help ensure farmer compliance with the Organic Rule.

CFS shares the real concern with our organic colleagues and the Livestock Committee about the potential lack of available non-GMO vaccines to combat a severe disease

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<sup>2</sup> Chan, Vivian S. (2006). "Use of genetically modified viruses and genetically engineered virus-vector vaccines; Environmental effects," *Journal of Toxicology and Environmental Health Part A*, 69: 1971-1977.

<sup>3</sup> Robinson, Harriet L. and Tamera M. Pertmer. (2000). "DNA vaccines for viral infections: Basic studies and applications," *Advances in Virus Research*, 55: 1-74.

outbreak, in the rare event that some type of “emergency” is declared by either the Federal or State government. We understand that when farmers lose livestock to a disease outbreak, they could lose a lot more than animals. The loss could translate into the complete elimination of decades of breeding by successive generations of livestock farmers, who have worked hard to breed their particular stock so that their herds or flocks are suited for the type of production system and region where their farm is located. Nonetheless, allowing an unreviewed GMO vaccine to be used in organic livestock production will not necessarily protect this important genetic resource that is integral to the livelihood of farmers. Surely, a better solution can be developed, based upon sound science, that upholds the principle of organic integrity.

### **Handling Committee—Carrageenan**

Although CFS agrees with the Handling Committee’s recommendation to re-classify carrageenan as a synthetic, we disagree with its recommendation to re-list it on the National List (§205.605(b)).

A quick survey of organic products on supermarket shelves that contain carrageenan shows that carrageenan is not essential in the production of organic food and beverages. Producers of many identical products avoid the use of carrageenan altogether or use alternative ingredients that serve the same function during production.

Research has shown that consuming carrageenan may have adverse health effects, ranging from colonic ulcerations to cancer. The foundational review article on carrageenan, written by Joanne Tobacman from the University of Iowa, also referenced in the TR, paints an unfavorable picture of the substance. The author notes that as early as 1982, “sufficient evidence for the carcinogenicity of degraded carrageenan in animals” was proof enough for the International Agency for Research on Cancer to declare that it posed a carcinogenic risk to humans.<sup>4,5</sup> Yet, even in the face of this knowledge, FDA has allowed the use of carrageenan to continue without restriction. Tobacman’s article concludes with this strongly worded cautionary note: “The potential role of carrageenan in the development of gastrointestinal malignancy and inflammatory bowel disease requires careful reconsideration of the advisability of its continued use as a food additive.”<sup>6</sup> Information contained in Tobacman’s study and others<sup>7</sup> provides ample evidence of the many adverse

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<sup>4</sup> Tobacman, Joanne K. (2001). “Review of Harmful Gastrointestinal Effects of Carrageenan in Animal Experiments”, *Environmental Health Perspectives*, 109(10): 983-994.

<sup>5</sup>WHO International Agency for Research on Cancer. (1998). “Some Food Additives, Feed Additives and Naturally Occurring Substances: Summary of Data Reported and Evaluation,” *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans*, Vol. 31. Available at: <http://monographs.iarc.fr/ENG/Monographs/vol31/volume31.pdf>

<sup>6</sup> Tobacman. (2001). p. 993.

<sup>7</sup> Bhattacharyya, Sumit, Pradeep K. Dudeja, Joanne K. Tobacman. (2008). “Carrageenan-induced NFκB activation depends on distinct pathways mediated by reactive oxygen species and Hsp27 or by Bcl10,” *Biochimica et Biophysica Acta (BBA) - General Subjects*, 1780(7–8): 973-982.; Marcus, R. and James Watt. (1980). “Potential Hazards of Carrageenan,” *The Lancet*, 315(8168): 602-603.

health effects associated with carrageenan which make the substance incompatible with organic systems of production.

Moreover, the TR for carrageenan acknowledges a range of environmental impacts associated with carrageenan production, the most severe of which is the over-harvesting of seaweed from which the substance is derived. Overharvesting of a material or substance from its natural environment, with the potential to disrupt the ecosystem where it is found, is clearly not a practice that organic food production systems should encourage or support.

### **Crops Committee—Inerts**

CFS supports the Committee's recommendation to review individual chemicals on the former List 3 inerts by 2015. Nonetheless, we are surprised to see the Crops Committee delay the vote on these chemicals for another two years rather than present a recommendation at this meeting, especially since there are only three or four chemicals on the list. Ten years of continued delays make no sense, particularly since there is complete Board agreement to review the individual chemicals on the list.

It is now clear that many substances formerly listed as "inerts" are far from it and, in fact, they are quite the opposite – toxic and active. That is why we support the National Organic Coalition's recommendation to change the referent category of chemicals from "inerts" to "formerly known as inerts." This would clarify the NOSB's understanding of those chemicals as the Board proceeds with its review.

We are disappointed to see the Crops Committee recommendation fall short of addressing former List 4a and 4b inerts. Based upon the NOSB's 2007 and 2008 Board acknowledgement of the need to review *all* inerts, it would seem logical that the Committee would have submitted a draft plan to review *all* inerts over a several year period at this meeting. Given the fact that some inerts are harmful to human health and the environment, it is absolutely necessary, and legally required, for the NOSB to commence its review at the earliest opportunity (7 USC 6517(c)(1)(C)). We urge the Committee to review former List 4b chemicals first, due to the acute toxic hazards they pose and because some chemicals on the list are considered endocrine disrupters that should not be permitted in organic systems. Continuing to delay this review compromises organic integrity and the organic label.

### **Policy Development Committee—Conflict of Interest**

CFS fully supports the Conflict of Interest proposed policy revision as presented by the Committee, with one recommended addition. As it stands, the proposed policy is noticeably silent on the conflict of interest among NOSB contractors and consultants who conduct technical reviews of materials for the National List. As such, CFS urges the NOSB to

add a provision to require full disclosure of any conflicts of interest on the part of NOSB contractors and consultants by adding the following paragraph to end of the policy:<sup>8</sup>

*Consistent with its COI policy, the NOSB seeks to ensure that contractors and consultants who provide research services to the NOSB do not stand to financially gain from any recommendations it makes with respect to the addition or removal of substances from the National List. Therefore, purveyors of such services will be requested to sign a conflict of interest statement, prior to the commencement of their work, which explicitly states that there is no actual or perceived direct financial interest to be gained from the outcome of their research that could prejudice the tone, scope or conclusion of the report in question or impair the individual or agency's objectivity. If a given contractor or consultant is unable or unwilling to sign the statement, then another individual or agency will be sought out to do the work.*

### **Policy Development Committee—Public Communication**

CFS fully supports the Policy Development Committee's recommendations on public communication. As we have stated in our previous comments<sup>9</sup> to the NOSB, we believe that the NOSB not only has the statutory authority<sup>10</sup> but also the responsibility to directly communicate issues of critical concern from the greater organic community directly to the Secretary of Agriculture. These issues include those on the NOSB's bi-annual agenda and those outside of the Board's agenda which members of the public are compelled to raise in their written and/or verbal comments.

We also strongly believe that the NOSB's work is greatly improved when experienced stakeholders are consulted during a Committee's development of a discussion document, proposed guidance, and/or recommendation. This helps the Board to fully understand the various positions of the affected stakeholders and to more fully grasp the complexity of the issues at hand. It can also further serve to minimize disagreements and deep conflicts at its bi-annual public meetings and has the potential positive effect of facilitating Board decisions that meet the needs of diverse stakeholders and the NOP.

One idea for facilitating communication between NOSB Committees and the public would be to open up an ongoing public docket to receive comments. This would be a valuable mechanism for stakeholders to engage individual Committees on critical issues of concern to their constituents. Also, once the NOP is able to post Committee meeting notes in a timely manner, it will be much easier for stakeholders to substantively contribute to the deliberations that go into preparing Committee documents and for the Committee to clarify and resolve points of disagreement, whenever possible.

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<sup>8</sup> National Organic Standards Board. (2011). "Conflict of Interest," *Policies and Procedures Manual*, 2 Dec. Revised Edition, 9.

<sup>9</sup> Center for Food Safety. (2011). "November 2011 CFS Comments to the National Organic Standard Board." Available at: <http://www.centerforfoodsafety.org/wp-content/uploads/2011/11/FINAL-CFS-NOSB-Comments-13-Nov.-2011.pdf>

<sup>10</sup> Organic Foods Production Act of 1990. Sec. 2119. [7 U.S.C. 6518] National Organic Standards Board.

## Livestock Committee—Animal Welfare

CFS applauds NOSB's efforts to support animal welfare standards for organic poultry operations by providing the Guidance "to aid the assessment of whether or not the requirements of § 205.238 – 241 are being met sufficiently to demonstrate adequate animal welfare conditions on organic poultry operations."<sup>11</sup> What this means to CFS is that organic standards and the Guidance must include all necessary safeguards to ensure animals are well-fed, healthy, have access to the outdoors, raised in an environment that allows them to engage in natural behaviors, and that they are humanely slaughtered. However, CFS has found serious gaps in the proposed Poultry Guidance (PG) which would likely have the effect of compromising animals and food products under the OFPA and NOSB regulations. In our analysis, nearly every category in the draft PG fails to encourage employee training and sufficient monitoring of animal welfare practices or recording of a reasonable amount of monitoring data.<sup>12</sup> All of these protections are necessary to ensure that animal welfare measures actually function as intended and that they are transparent and verifiable by certification agencies.

In our November 2011 comments to the NOSB, CFS expressed its concern that "heavily prescriptive or quantifiable measures to define the limits of animal welfare standards" are problematic. They don't allow either the farmer or certifier enough room for considering individualized solutions that are suitable for the wide range of production systems used by organic livestock producers of differing scales and located in different parts of the country. They also add an increased burden of documentation with minimal improvement to the organic system, among other issues.

While we understand that these animal welfare documents are being offered as "guidance" to certification agencies, we are concerned that some certifiers will judge farms as acceptable or not, solely on the documents containing quantitative measurements. CFS would have preferred to see animal welfare approached from a position of reviewing a farm's organic system and how it provides the best interaction between their animals and their environment. ***Organic means protecting and enhancing soil, water and air resources while providing animal living conditions that allow for the natural behavior of the animal, lessening of stress, and healthy living conditions.***

### *Quantitative Criteria and "Body Scoring"*

Current U.S. animal welfare standards were written in response to problems relating to animal welfare found on some non-organic and, many times, on factory-style farms. Those facilities' effects on and existence within the ecosystem are not typically part of the management strategy implemented by industrially-managed farms. To use the same tools and measures designed for such a completely different system does a disservice to both

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<sup>11</sup> Poultry Guidance (Mar. 28, 2012) at LC1.

<sup>12</sup> CFS recognizes certain information must be recorded per a farmer's Organic Systems Plan. As discussed herein, in certain instances for some facilities, it may be necessary to consider reporting of other information to ensure that all facilities meet the "gold standard" of organic certification.



these standards and to the organic farmers that would need to implement them. The lack of integration of the livestock with the land which provides them food, exercise, and which is the recipient of their waste, exposes these standards as being incomplete. By trying to force the round organic farmer into the square hole of judging animal welfare by a number scoring system, we ignore the importance of managing the farm as a holistic system, a foundational concept of organic.

We specifically object to “body scoring” as the NOSB’s preferred method of judging animal welfare. Any system of assessment for animal welfare on organic farms must take into account the specific ecosystem, the most recent climatic conditions, and the overall Organic System Plan (OSP) of the farmer. Since an organic inspector visits each farm only once per year, it is unfair to judge the animals with specific body scoring criteria, when there could have been a 4 inch rain the day before with resulting areas of mud. These animals would be wet, dirty and could have some difficulty walking. Body scoring is also a subjective science, with highly trained personnel determining a different score on the same animal in many cases.

From an organic certification point of view, the inspector is supposed to be an observer and report back to the certifier, who then makes the certification decision. By relying heavily on a numerical methodology, based upon subjective judgment criteria, the inspector is discouraged from “painting a picture” of the farm and its system. Instead, they will be providing information that already is considered a final assessment of animal welfare. The rights of organic farmers and their respect for a particular ecosystem are, therefore, compromised by a methodology such as “body scoring.”

In many cases, large confinement operations might be able to have their animals, from cows to poultry, score high on quantifiable animal welfare scoring. However, the greater environmental and health impacts of these concentrated animal operations is not taken into account in this type animal welfare scoring. We must not lose the environmental focus on organic farms. It is through the recognition of the interdependency of all of the activities of the farm that organic farmers innovate and develop a wide variety of beneficial systems for both their livestock and the land.

While many of the points made in the PG provide generally good assessments of what healthy animals should look like and what their living conditions should provide, CFS believes that these standards could still be improved to prevent a one-sided, solely quantitative assessment of animal welfare. Instead, we should be looking primarily at qualitative standards, ones that provide guidance on the quality of the overall system, and not just the quantity of correct activities or results seen once a year on an organic farm. Rather than relying solely on animal welfare standards born out of non-organic farming systems, the NOSB should expand their thinking and Guidance to better incorporate these concerns and to include the organic point of view.

We believe that the Livestock Committee’s work is not yet complete on this subject. Further guidance, building upon some of the good work in specific sections of the poultry guidance, using a more systems-based approach, should be added to this proposed

Guidance. It would provide a more well-rounded and versatile toolbox for producers, inspectors and certifiers to use when judging high-quality animal welfare on all organic farms. In certain circumstances, areas where strict numerical assessments are provided should be rejected and instead replaced with a vision that farmers can strive to achieve of a healthy farm, with the needs and effects of the interactions of livestock and the environment taken into account.

CFS favors a qualitative approach to animal welfare so as to allow for flexibility required of diverse organic farming operations in a variety of ecosystems, geographies, climates, etc. There are so many scenarios where a qualitative approach is best for organic food production. However, CFS also recognizes that NOSB's guidance must simultaneously address the full spectrum of organic farms, from those striving to be as holistic as possible by integrating both crops and animals into a whole farm ecosystem to those large-scale production facilities where the sheer size of the operation could impinge upon the use of preferred animal welfare practices (see comment below on facility size). Despite the variety of producers covered by the NOSB, in certain situations, a quantitative approach may be necessary to establish the "floor" of what is acceptable in the "gold standard" of organic practices. Farmers and farm employees are responsible for making sure animals have all of their needs met. Hence CFS strongly recommends that NOSB include employee training and reasonable record-keeping requirements in its Guidance. This will go a long way to secure and support organic producers' good practices, backing up the organic certification process, and ensuring animal welfare.

### *Facility Size*

Since organic rules require chickens to have access to the outdoors, and currently the size of outdoor egg farms is limited by FDA to 3,000 chickens, organic egg farms (or individual flocks) are thus limited to 3,000 in size.<sup>13</sup> CAFOs may be small, medium or large under the Clean Water Act regulations. The categorization depends both on the number of layers, broilers, or chickens, and on the kind of manure handling system in use. Typically facilities with more than 9,000 laying hens or broilers using liquid manure handling systems are "medium" CAFOs.<sup>14</sup> "Large" poultry facilities generally exceeding 30,000 laying hens or broilers and using a liquid manure handling system are CAFOs.<sup>15</sup> In the push for profitability, some producers may comply with organic standards as minimally as possible, compromising the intended uniformity of organic production.<sup>16</sup>

CFS recommends that within the PG, NOSB recognize the diversity in size that exists for organic poultry producers and build in guiding provisions that do not encourage a cookie-cutter approach. For example, certain quantitative measurements referred to within these comments may be more suitable for larger facilities, but not necessary or substantive

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<sup>13</sup> See 21 CFR 118.1.

<sup>14</sup> 40 CFR 122.23(b)(6)(i)(I)-(J).

<sup>15</sup> 40 CFR 122.23(b)(4)(ix)-(xi).

<sup>16</sup> See Chad M. Kruse, Student Author, *The Not-So-Organic Dairy Regulations of the Organic Food Production Act of 1990*, 30 S. Ill. U. L.J. 501, 516-18 (2006) (describing allegations that cost-motivated factory farming practices are not sufficiently compliant with the Organic Foods Production Act to be considered organic).

indicators for smaller organic poultry facilities.

### *Nutritional Requirements*

The nutritional requirements put forth in the PG are generally commendable.

With respect to water drinkers, the PG proposes 1 nipple drinker per 12 hens. CFS suggests that by only slightly changing this guideline to 1 nipple drinker per 10 hens, the NOSB could offer poultry less competition for a vital resource and increase the animal welfare of poultry, as per the Humane Farm Animal Care Standards.<sup>17</sup>

### *Physical Alterations (Beak Trimming) and Preventing Injurious Pecking*

CFS generally opposes beak trimming and encourages producers to first proactively seek alternative management methods of preventing cannibalism amongst birds, as per the draft PG.<sup>18</sup> Beak trimming—a painful procedure often causing pain throughout an animal’s life—is commonly performed as a way to reduce feather pecking.<sup>19</sup> Yet studies indicate that beak trimming does not reduce feather pecking and that other more humane procedures do.<sup>20</sup> While infrared technology is preferable, it may not be available for many poultry producers. Instead of routine beak trimming, CFS recommends providing sufficient litter and scratching materials and ample access to vegetative outdoor areas, thereby reducing feather pecking by allowing poultry to engage in natural behaviors. Only if such methods prove ineffective should producers consider beak trimming. The area where the PG falls short in this regard is in addressing the specifics of beak trimming practices. CFS proposes that NOSB recommend that any beak trimming is performed by trained farm personnel and that any beak trimming is limited to portions of the upper or lower mandible. Such limitations are essential for creating humane limitations on what can easily become an inhumane practice.

### *Forced Molting*

The NOSB’s Poultry Guidance on forced molting must be clearer than in its current version. The first sentence says “[f]orced molting by feed withdrawal is not permitted...” yet the second sentence states “[i]f forced molting is practiced....”<sup>21</sup> CFS agrees that forced molting by feed withdrawal must not be allowed. The Guidance, however, must be much clearer under what conditions forced molting may be applied, specifying when, and under what conditions, it may be acceptable to ensure humane treatment, respect of flocks’ natural cycles, and to avoid abuse.

<sup>17</sup> See, e.g., Chickens, Humane Farm Animal Care – Animal Care Standards (Feb. 2009) at 3.

<sup>18</sup> See, e.g., Comments, Center for Food Safety, Docket No. AMS-NOP-11-0014; NOP-11-05 at 3 (Apr. 10, 2011).

<sup>19</sup> MICHAEL C. APPLEBY ET AL., POULTRY BEHAVIOR AND WELFARE 88 (CABI Publishing 2004); ROLLIN, FARM ANIMAL WELFARE: SOCIAL, BIOETHICAL, AND RESEARCH ISSUES 119 (Iowa St. U. Press 1995).

<sup>20</sup> MENKE ET AL., ANIMAL HEALTH AND WELFARE IN ORGANIC AGRICULTURE, MUTILATIONS IN ORGANIC ANIMAL HUSBANDRY 173 (M. Vaarst et al., eds. CABI Publishing 2004).

<sup>21</sup> Poultry Guidance (Mar. 28, 2012) at LC2.

## *Poultry Health*

The PG section on health is lacking in a number of ways that prevent it from holistically supporting a comprehensive and effective poultry health plan. First and foremost, the Guidance should focus more on *prevention* than on audits of existing conditions. By focusing on prevention, poultry health could be greatly ameliorated.

As written, some of the greatest and most significant weaknesses of the PG are that it: (1) suggests, but does not further explain how, poultry should be monitored for signs of stress and disease, (2) does not indicate any specific monitoring data to track, and (3) does not suggest which facilities should consult with a veterinarian to prepare and OSP for poultry. The PG should elaborate how it intersects on these issues with the OSP.

The PG proposes that “no more than 2% should have poor hygiene, lesions or other injuries.”<sup>22</sup> This proposal regarding animal health must be further contextualized by the NOSB to have practical applications because these are just symptoms of a potential larger problem. For example, it is important to understand the cause of the lesions or injury. What are the conditions that created the problem in the first place? Can the organic system be improved to eliminate the source of the problem? The PG does not specify whether this applies to a flock or all birds under a producer’s control. The PG does not specify during what time period the 2% timeframe is permissible, what birds count towards a 2% tally, and NOSB does not offer any justification for why a 2% tolerance number should be acceptable.

The PG does propose that all poultry farms draft and follow an animal health plan; however, it does not take the next step of advocating that the animal health plan is updated on a regular basis. The animal health plan proposal also does not include any policy requirements for cleaning, disinfection, tolerance levels for each of the proposed plan requirements (including vaccinations, biosecurity, contingency plans for emergencies, predator exclusion steps, veterinary contacts, and emergency euthanasia procedures).

The Guidance should also focus more on prevention of lameness rather than “diagnosis” of the degree of a bird’s lameness by scoring. The reason the Guidance focuses on scoring is because not enough prevention is done. If NOSB decides to pursue gait scoring, any such system should be more descriptive to assist producers in making important determinations regarding birds’ lameness and mobility impairment. For example, specified time frames are needed so that producers can carefully evaluate a bird’s condition and pain level. This would advise a handler on how best to assess a bird’s ability to stand or walk. Just because such a bird can stand or walk for 2 or 3 seconds does not mean the bird is not in pain or healthy. Scores 2 and 3 for birds that have gait abnormalities that impair functions should specify what examples of functions are impaired (e.g. feeding and drinking) at each score category. While the PG states that, ideally, no birds should reach Score 3 since they are

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<sup>22</sup> Poultry Guidance (Mar. 28, 2012) at LC2.

probably experiencing pain at those scores,<sup>23</sup> the Guidelines need to specify what a producer must do about birds at those levels.

To prevent leg problems, the PG proposes limiting broiler growth to no more than 45g per day and this should be achieved without feed restriction.<sup>24</sup> The PG should, as part of the leg problem prevention approach, establish criteria for monitoring leg problems, and for when a veterinarian should be consulted.

With respect to dermatitis, the PG encourages producers to avoid dermatitis lesions by preventing wet, sticky or compact litter.<sup>25</sup> To encourage healthy environments for poultry, they should also simultaneously state that wet litter must be replaced promptly. If producers have dry, friable litter at all times the ammonia levels are likely to be low. Elevated ammonia levels can cause respiratory issues and blindness in birds.

### *Indoor Living Conditions*

The PG indoor living conditions do not address the kind of flooring that the NOSB recommends. CFS recommends flooring of a solid, smooth, hard construction type and without significant cracks.

The lighting recommended by the PG currently includes an 8 hour rest period daily. CFS urges the NOSB to also include a recommendation for a minimum of 8 hours of light daily as well.<sup>26</sup> A continuous period of darkness is required so birds can sleep, which helps the growth of birds so that their bones can hold the weight they are gaining. If the lights are on, poultry will eat more and producers can fatten birds more quickly, slaughter them more quickly, and market them more quickly, but this is not an appropriate animal welfare practice. As such, the lighting should be regulated appropriately.

The PG also does not address whether heating and cooling systems are required, or how humidity should be regulated in indoor living conditions. Temperature and humidity control should be regulated appropriately.

The PG addresses ventilation, but should do so in a more specific fashion. For example, the Guidance advises that ammonia levels should “generally” be less than 10ppm, but it fails to specify at what height and where this measurement should be taken (e.g. at bird height), and omits to state during what time period. The PG suggests using test strips to test ammonia levels, and says “if excessive ammonia is noted a second test using passive dosimeter or gas detection tubes should be conducted.”<sup>27</sup> The Guidance does not specify what constitutes “excessive” ammonia, or the conditions governing such testing. It also

<sup>23</sup> Poultry Guidance (Mar. 28, 2012) at LC3.

<sup>24</sup> Poultry Guidance (Mar. 28, 2012) at LC3.

<sup>25</sup> Poultry Guidance (Mar. 28, 2012) at LC3.

<sup>26</sup> The E.U. requires a minimum of six hours of darkness per day. *See, e.g.*, Council Directive 2007/43 EC Laying Down Minimum Standards for the Protection of Chickens Kept for Meat Production, Annex I,7, 2007 O.J. (L 182) 19-28 (EU).

<sup>27</sup> Poultry Guidance (Mar. 28, 2012) at LC10.

does not require ventilation systems and should do so in order to provide a healthy and clean indoors environment.

The PG completely ignores other air quality measurements that are essential to determining the health of an animal facility — namely, hydrogen sulfide, carbon dioxide, carbon monoxide, and volatile organic compounds (VOCs). Some of these air pollutants react with chemicals in the atmosphere to form fine particulate matter (PM<sub>2.5</sub>, PM<sub>10</sub> and TSP), which can cause health effects for animals and humans miles away from large size animal facilities.

The PG says “[d]ust should also be kept to a minimum”,<sup>28</sup> but fails to qualify or define what constitutes “a minimum” or to specify when and where dust measurements should be taken. “Dust” from some larger facilities can in fact include endotoxins and particles dangerous for human health. CFS recommends that in the interest of continuing the NOSB’s role of establishing the “gold standard”, NOSB consider not just current baseline standards of the Occupational Safety & Health Administration (OSHA) and the National Institute for Occupational Safety & Health (NIOSH), but also the findings of studies on dust and particulate matter on large animal production facilities.<sup>29</sup> CFS recommends that the PG require testing of certain poultry facilities for these air quality indicators, and consider implementing even stricter standards than OSHA and NIOSH.

Lastly, the PG does not suggest ongoing monitoring and recording of monitoring data for air quality, heat, or light / darkness, but the Guidance should do so to ensure all producers adhere to organic standards and promote poultry health.

### *Outdoor Access and Living Conditions*

The PG provisions state that outdoor access must be provided to all poultry, but does not provide a number of days that animals should have access to the outdoors.

The PG does not – but should - provide specifications regarding the moisture tolerance levels or drainage requirements for poultry outdoor access areas. CFS also suggests that regional differences and weather events be taken into account for any such specifications.

The PG states that producers may “[r]otate the use of range areas by taking flocks off of pasture to prevent the buildup of infectious organisms and allow the re-growth of vegetation.”<sup>30</sup> First, such a statement is inconsistent. Rotation means *pasture* rotation and

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<sup>28</sup> Poultry Guidance (Mar. 28, 2012) at LC10.

<sup>29</sup> See, e.g., Dana Cole et al., “Concentrated Swine Feeding Operations and Public Health: A Review of Occupational and Community Health Effects.” 108 ENV. HEALTH PERSPECT. 8 (Aug. 2000); Peter S. Thorne, “Environmental Health Impacts of Concentrated Animal Feeding Operations: Anticipating Hazards – Searching for Solutions.” 115 ENV. HEALTH PERSPECT. 2 (Feb. 2007); Shawn G. Gibbs et al., “Isolation of Antibiotic-Resistant Bacteria from the Air Plume Downwind of a Swine Confined or Concentrated Animal Feeding Operation.” 114 ENV. HEALTH PERSPECT. 7 (July 2006). These studies address primarily swine facilities, but do note that there are similar considerations and problems for poultry and cattle facilities.

<sup>30</sup> Poultry Guidance (Mar. 28, 2012) at LC11.

not taking flocks off of pasture. Second, without any context for how long poultry may be taken off of *a particular pasture and moved to another one*, the PG contains a loophole that could be taken advantage of, which is contrary to the principles of rotation. CFS recommends that the NOSB simply re-word this particular Guidance and propose a limit to this time off of pasture so that producers do not take advantage of a system designed to encourage healthy rotation. The goal is that any time off of pasture would be temporary, and solely to prevent buildup of infectious organisms and to allow the re-growth of vegetation.

The PG has adopted space allowances partially in conformity with CFS's prior recommendations, however CFS continues to believe the proposed Guidance does not go far enough. The Poultry Guidance space allowance for every bird *other than laying hens and breeders* is based on a bird's weight. CFS agrees that NOSB should use a weight-based space allowance protocol, but CFS insists that NOSB use this standard for *all* birds. NOSB's current proposal allows for 2.0 square feet per bird for laying hens and breeders and this is simply unacceptable. CFS has previously advocated that space allowance should be based on weight, and continues to support that basis for space allowance calculations. The European Union (EU), for example, has conventional poultry standards that provide 2-6 square feet per bird.<sup>31</sup> U.S. organic standards should aim higher. In order to ascertain appropriate animal welfare standards for organically raised animals, producers must provide their animals with plenty of space to exhibit natural behaviors. NOSB's recommendations for this space are simply not strong enough to ensure animal welfare. CFS believes that the stocking rates for chickens must be greatly increased and must be based on bird weight, not on the number of birds.

Furthermore, the Guidance space allowance requirements must allow for variable housing systems depending on the region. Cold winters and hot summers should be taken into account into space guidelines.

The PG also permits "slatted / grated floors" to be considered as floor space.<sup>32</sup> It is unclear whether the PG is proposing that this be in an outdoor or indoor environment. If indoors, this flooring is not acceptable. Floors should be of a solid, smooth, hard construction and there must be no significant cracks in the floors. If outdoors, poultry should not be on floors but should be on pasture and not in need of floors.

### *Humane Handling of Poultry*

The PG does not address important aspects of poultry handling that relate to employee training. It is possible to reduce animal suffering by instituting training programs. In the

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<sup>31</sup> EU standards provide for approximately 16 to 20 pounds of broiler per 12 square feet. Broiler slaughter weight ranges from 3.5 to 6 lbs. Therefore, the EU standards allow anywhere from 2 to 6 full grown broilers per 12 square feet, depending on whether enhanced animal welfare measures are used. Council Directive 2007/43 EC Laying Down the Minimum Rules for the Protection of Chickens Kept for Meat Production, art.3(2), (2007) O.J. (L 182) 19-28 (EU). The proposed broiler stocking density is much weaker than EU standards, allowing 1 bird per square foot. European *Id.*

<sup>32</sup> Poultry Guidance (Mar. 28, 2012) at LC12.

EU, it is common for animal welfare regulations to recommend that all employees handling animals attend animal welfare training courses.<sup>33</sup> CFS recommended previously that employee training should be part of the NOSB regulations. The Guidance does not state a limit for the number of birds an employee can carry, whether any employee training is required, and how animal welfare is to be during the catching process. To minimize stress of the birds, CFS recommends that catching take place in low lighting, that birds be caught individually and carried by the legs, and that no more than 3 birds should be carried in one hand. CFS further recommends that should crowding occur during catching, the Guideline proposes procedures including that the handling of poultry should cease, poultry should be allowed to settle, and then catching may re-start. The PG says inspectors should “discuss” procedures for catching and loading poultry, but does not address employee training on this issue so as to minimize injury to birds.

CFS believes NOSB could provide much more detailed transport animal welfare provisions. CFS recommends that NOSB adopt provisions for feeding and watering as well as detailed requirements for the allowable length of journey time, and access to food and water.<sup>34</sup> CFS also recommends that NOSB put forth guidelines for space allowances for transport. The current NOSB guidelines do not do so. The guidelines also do not address ventilation during transport, monitoring of welfare during transport, the size of transport trays, and how birds can be sheltered from weather conditions during transport. Lastly, producers should be required to record mortality data during transportation, and the NOSB must propose acceptable limits on mortality rates during transportation.

### *Euthanasia and Depopulation*

CFS proposes the following changes to the PG on euthanasia and depopulation:

First, the guidelines propose that “[n]o live birds should be found on dead piles.” In the interest of animal welfare and humane practices, the focus of this guideline should be reversed; it should read “[n]o live birds can be placed on dead piles.” A live animal should not have to wait to be *discovered* on a dead pile; it *should not be placed* on a dead pile in the first instance. Similarly, the guidelines state that “[i]t is extremely important to confirm that all animals are dead before disposal.”<sup>35</sup> CFS recommends that NOSB demonstrate how important this issue is by simply inserting the word “immediately” so that the Poultry Guideline reads “[i]t is extremely important to *immediately* confirm that all animals are dead before disposal.” If poultry facility employees are properly trained, they will know how to properly identify a live animal, not place it on a dead pile, and provide the bird with an immediate humane death if appropriate.

<sup>33</sup> See, e.g., Council Directive 2007/43, EC Laying Down the Minimum Rules for the Protection of Chickens Kept for Meat Production, ¶ 9 and art. 4, 2007 O.J. (L 182) 20 and 22 (EU).

<sup>34</sup> Council Regulation 1/2005, Annex, 2005 O.J. (L 3/1) (EC).

<sup>35</sup> Poultry Guidance (Mar. 28, 2012) at LC16.



Second, the PG allows for electrical or percussive stunning followed by neck cutting.<sup>36</sup> CFS believes that NOSB could raise the standard on this procedure by simply inserting a timing requirement for the neck cutting. CFS recommends that neck cutting occur within 10 seconds of the stun.

CFS cannot emphasize enough the need for NOSB to include in its Guidance employee training requirements. Such a requirement is the backbone of all of NOSB's animal welfare provisions. Furthermore, CFS encourages NOSB to require monitoring and recording of data so that the use of humane practices supported by the NOSB can be confirmed.

### *Slaughter of Poultry*

Although the PG requires facilities to perform self-audits on a weekly basis, the NOSB must go one step further and require that this audit data is recorded.

The proposed PG states that “[o]rganic certifiers can use documentation from other third-party animal welfare audits that have been performed and should do additional auditing as necessary.”<sup>37</sup> CFS strongly questions how such an ambiguous, non-binding standard can possibly satisfy the organic standards. NOSB's PG does not specify what third-party standards may be acceptable or not acceptable, or explain why such standard is so. CFS recommends that NOSB specify the standard and that NOSB adopt those of Certified Humane.

NOSB must also require that employees charged with slaughter functions are trained. Even limited training can make an enormous difference in animal welfare, especially at slaughter. CFS recommends, as it has previously, that NOSB promote comprehensive training for animal transporters and veterinarians overseeing slaughter. NOSB should also require an animal welfare officer be appointed to oversee slaughter operations.

So as to minimize trauma to birds, the NOSB should require that birds are slaughtered as soon as possible after arriving at a slaughter facility. Birds should also be handled humanely during the slaughter process, and the shackle time should be limited to 90 seconds.

### *Stunning and Bleeding*

For stunning, the current guidelines state that “[a]ll birds (100%) should be dead before they enter the scald tank.”<sup>38</sup> CFS believes the NOSB could ameliorate the animal welfare component of the guidelines by simply making sure that the inspector assessing whether birds are rendered insensible by the stunning does so before birds enter the scald tank. If at this point it appears that a bird is not stunned, immediate action must be taken to humanely kill the bird.

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<sup>36</sup> Poultry Guidance (Mar. 28, 2012) at LC14.

<sup>37</sup> Poultry Guidance (Mar. 28, 2012) at LC15.

<sup>38</sup> Poultry Guidance (Mar. 28, 2012) at LC16.

The PG does not suggest a time within which slaughter and plucking should occur. Since birds may maintain some nerve sensitivity after death, CFS recommends that they should not be immersed in scalding tanks or plucked until at least 90 seconds have elapsed since major blood vessels in their necks have been severed. This will serve to limit pain, discomfort, and trauma to birds.

The PG allows for a maximum of 2% of birds to have broken or dislocated wings, and no birds should have broken legs. CFS believes by instituting employee training this maximum threshold can be lowered and damages to birds decreased.

### *Conclusions*

All of the Poultry Guideline provisions should address animal welfare training for employees handling animals, especially those performing physical alterations. It is possible to reduce animal suffering by instituting training programs. As CFS has previously recommended, and as is practiced in the EU, it is common for animal welfare regulations to recommend that all employees handling animals attend animal welfare training courses.<sup>39</sup> Even limited training can provide farm workers with information on the sensitivity of animals to negative handling and the practical benefits in ease of management and productivity when positive procedures are adopted.<sup>40</sup> Training can focus on the most common and painful physical alterations, minimizing animal pain and suffering and promoting proper handling. Such limited training need not be cost prohibitive to small farmers, as local veterinarians and even veterinary students could be enlisted and costs potentially subsidized.

The Poultry Guideline should also require regular monitoring and recording of data on aspects of poultry operations to enable producers to track the effects of animal welfare practices on animal health. This data will also facilitate determining whether producers are in compliance with NOSB recommendations and their Organic System Plans.

### **Materials Committee—Aquaculture**

Although the Materials Committee did not include a document on aquaculture for public comment and discussion at the upcoming NOSB meeting in New Mexico, since it is an agenda topic, CFS would like to reiterate its support for moving forward with the development of regulations on this important growth industry for organic.

CFS believes that organic aquaculture has the potential to provide consumers with a healthy, fresh, organic source of fish protein. However, a truly holistic organic regulatory system is needed — from facility siting to fish harvesting — to ensure that organic

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<sup>39</sup> See, e.g. Council Directive 2001/93, EC Laying Down the Minimum Standards for the Protection of Pigs, art. 5, 2001 O.J. (L 316) 36-38 (EU).

<sup>40</sup> EU Scientific Veterinary Committee, *The Welfare of Intensively Kept Pigs*, (Sep. 30, 1997) available at [http://ec.europa.eu/food/animal/welfare/farm/out17\\_en.pdf](http://ec.europa.eu/food/animal/welfare/farm/out17_en.pdf) (last visited April 8, 2010).

aquaculture systems of production uphold the NOSB's Principles of Organic<sup>41</sup> and the letter of the OFPA law. Moreover, we believe that organic aquaculture production systems can avoid the environmental and human health impacts associated with existing industrial aquaculture production methods and, instead, supply an alternative, efficient, environmentally sound, and humanely produced source of human food protein.<sup>42</sup>

That is why we support the careful development of organic aquaculture regulations, beginning with land-based, closed-loop, recirculating systems. Such systems eliminate fish escapes because they are closed to the outside environment and located removed from water bodies. They minimize environmental impacts by recycling clean water in closed systems with the aid of beneficial microbes and plant species. Small to medium scale aquaculture systems allow for the routine regulation, monitoring, and control of inputs, outputs, pH, water quality, and fish health and welfare. They also allow for the efficient use of energy, space, and water. Waste products generated within the aquaculture system can be utilized and incorporated into the system by the plants and animals living there, minimizing the need for waste disposal outside of the system. Wastes that cannot be avoided, can be repurposed, composted, used as fertilizers or managed in the same way that livestock waste is managed under the organic standards. Water discharged from cleaning and restocking must be made as clean as or even cleaner than when it entered the system.

This type of ecological fish farming system sharply contrasts with ocean-based facilities and open ocean net pens currently used for non-organic aquaculture production, which we do not support. CFS believes that such facilities should ever be allowed to be certified organic because fish escapes are impossible to prevent or control, as is evidenced by numerous case studies from around the world that have documented such releases.<sup>43</sup> Escapes from fish farms not only negatively impact marine biodiversity, but they also disrupt the natural behavior of marine life by introducing alternative food sources, foreign matter, species, diseases, and parasites into the marine environment.

CFS also does not support harvesting wild forage fish to feed farmed fish, under any circumstance, as was recommended by the NOSB in 2008. Organic aquaculture systems must never be allowed to compete with wild marine life for food. Not only is it ecologically unsustainable, but it is also inconsistent with the Principles of Organic<sup>44</sup> production. This is also one of the many reasons why carnivorous fish, such as salmon, which require a protein-rich diet that includes wild fish, fish meal and fish oil, should never be approved as "organic." Moreover, migratory fishlike salmon, whose natural behavior dictates that they migrate from the sea, up rivers, to breed in fresh water, are inappropriate species for fish farming in captivity.

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<sup>41</sup> National Organic Standards Board. (2001) "NOSB Principles of Organic Production and Handling," *NOSB Policy and Procedures Manual*, Revised April 29, 2011.

<sup>42</sup> Research has shown that it takes over three tons of wild fish to produce one ton of farmed salmon. (Naylor. Rosamond et al. (2000). "Effect of aquaculture on world fish supplies," *Nature*, 405: 1017-1024.

<sup>43</sup> See Appendix 1: Chart of Fish Escapes.

<sup>44</sup> National Organic Standards Board. (2001) "NOSB Principles of Organic Production and Handling," *NOSB Policy and Procedures Manual*, Revised April 29, 2011.

Fish feed is one of the critical components of a certifiable organic aquaculture system. In order for farmed fish to be certified organic, OFPA<sup>45</sup> requires that they are fed organically produced feed, as required of other livestock, and reflected in the Organic Rule.<sup>46</sup> The Courts have interpreted these provisions to require that organic livestock receive a 100% organic feed ration. This cannot in any way be legally interpreted to mean that wild forage fish can be considered certified organic because they are not grown and managed in accordance with OFPA.

The only exception to the 100% organic feed ration requirement is allowances for non-synthetic and permitted synthetic substances that are feed additives and feed supplements in §205,252(e). According to OFPA regulations, “feed” includes all “edible materials which are consumed by livestock for their nutritional value” and “encompasses *all* agricultural commodities.”<sup>47</sup> Wild fish meal and fish oil do not fall into this category of allowable supplements and additives because they are considered feed.

Keeping these and other important organic parameters in mind, it is clear that not every type of fish farm or fish species can be certified organic. That is why we support the development of organic aquaculture regulations, beginning with land-based, closed-loop, recirculating systems. To that end, we believe that the following principles should provide the foundation for an organic aquaculture system and future regulatory development:

1. Enhancing the biodiversity and aquatic ecology within the system to minimize external inputs. This includes growing plants, bivalves, other shell fish and bottom feeders within the system to filter waste, supply nutrients, and provide habitat and shelter.
2. Prohibiting dangerous inputs and outputs. This includes materials already prohibited in organic such as: antibiotics, genetically engineered inputs, hormones, growth regulators, synthetic pesticides and fertilizers, synthetic dyes and colorants, and all other substances that are prohibited under OFPA.
3. Supplying nutritious, 100% certified organic feed, as is required for all organic livestock and poultry producers under OFPA. The use of wild or non-organic farmed fish meal and fish oil in feed must be strictly prohibited.
4. In an organic aquaculture system, synthetic materials of any type must not be used to fulfill system functions such as feeding and filtering, and they must not be used as a crutch to prop up overcrowded or poorly designed systems. The limited synthetics that are permitted must be thoroughly vetted through a newly established Materials Review process specifically tailored for aquaculture systems. Synthetic Materials already on the National List cannot automatically be allowed in organic aquaculture systems, due to the

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<sup>45</sup> 7 U.S.C. §6509 (c)(1)

<sup>46</sup> 7 C.F.R. §205.237

<sup>47</sup> 7 C.F.R. §205.2

different ways in which materials react, persist, dissolve, spread, and are absorbed in water versus soil environments.

5. Stocking rates and the living environment of the system must promote and maintain the health and welfare of fish and other living organisms in a harmonious manner and non-stressful environment that is appropriate to the species, their reproductive needs, and the region in which the facility is located.

6. An Organic System Plan must be required, complete with records and audit trails, to allow certifiers to verify the integrity of the system and track fish products from the aquaculture facility to the point of purchase.

To ensure that such systems can adhere to strict organic standards, we advocate requiring a trial period to test and evaluate model systems, beginning with herbivorous fish species before organic aquaculture is widely commercialized. This would help avoid the pitfalls of permitting a type of fish or system that cannot meet the spirit, intent, and letter of OFPA.

Thank you for your consideration of these comments by the Center for Food Safety.

Respectfully submitted by,

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**Appendix 1:  
Escapes from Fish Farms  
By Year, Country, Species & Number of Escapes  
1996 — 2011**

| <b>Year</b>         | <b>Country</b>       | <b>Species</b>                  | <b># of Escapes</b>  |
|---------------------|----------------------|---------------------------------|--|
| 2011                | Canada/United States | Salmon                          | Unreported escaped fish being found in Canada and Maine rivers. <sup>i</sup> |
| 2010                | Canada               | Salmon                          | 13,000 <sup>ii</sup>   |
| 2010                | Canada               | Salmon                          | 138,000 <sup>iii</sup>   |
| 2010                | Canada               | Atlantic Salmon                 | 33,000; <sup>iv</sup> fish found in Maine rivers                             |
| 2010                | Scotland             | Salmon                          | 100,000 <sup>v</sup> ; hole in the net                                       |
| 2010                | Norway               | Salmon                          | 70,000 <sup>vi</sup>   |
| 2009                | Canada               | Salmon                          | 40,000 <sup>vii</sup>  |
| 2009                | Scotland             | Salmon                          | 37,000 <sup>viii</sup>   |
| 2009                | Scotland             | Atlantic Salmon                 | 132,051 <sup>ix</sup>  |
| 2009                | Scotland             | Rainbow Trout                   | 8,591 <sup>x</sup>   |
| 2009                | British Columbia     | Atlantic Salmon                 | 40,000; <sup>xi</sup> holes found in net                                     |
| Dec. 2008-Jan. 2009 | Chile                | Salmon & Trout                  | More than 700,000 <sup>xii</sup> ; bad weather, multiple farms               |
| 2008                | Canada               | Atlantic Salmon                 | 29,616 <sup>xiii</sup>   |
| 2008                | Scotland             | Salmon                          | 58,641 <sup>xiv</sup> ; 8 instances  |
| 2007                | United States        | Yellowtail                      | 1,500 <sup>xv</sup> ; cage left open   |
| 2007                | Norway               | Salmon                          | 290,000 <sup>xvi</sup>   |
| 2007                | Scotland             | Salmon and Trout                | More than 200,000 <sup>xvii</sup>  |
| 2007                | British Columbia     | Atlantic, Chinook & Coho salmon | 19,168; <sup>xviii</sup> 28 instances  |
| 2007                | Chile                | Salmon                          | 12 million; <sup>xix</sup> occurred during earthquake                        |
| 2007                | World                | Salmon                          | Estimated 3 million; <sup>xx</sup> annual figure                             |
| 2006                | Norway               | Salmon                          | 921,000 <sup>xxi</sup> *   |
| 2004                | Chile                | Salmon                          | 1 million <sup>xxii</sup>  |
| 2000                | United States        | Atlantic Salmon                 | More than 100,000 <sup>xxiii</sup> ; snow storm                              |
| 2001-2009           | Norway               | Rainbow Trout                   | 980,000 (110,000 per year) <sup>xxiv</sup>                                   |
| 2001-2009           | Norway               | Atlantic Cod                    | 1.05 million (175,000 per year) <sup>xxv</sup>                               |
| 2001-2009           | Norway               | Atlantic Salmon                 | 3.93 million (436,000 per year) <sup>xxvi</sup>                              |
| 1997                | United States        | Atlantic Salmon                 | 300,000 <sup>xxvii</sup>   |
| 1996                | United States        | Atlantic Salmon                 | 100,000 <sup>xxviii</sup>  |

\* Peak year for Norway fish escapes, the annual number of escapes has declined since then. (Compiled by the Center for Food Safety, October 2011)

## Implications of Escapes

Escapes of farmed fish from open ocean aquaculture facilities, salmon in particular, represent a significant environmental and food security threat, especially given the fragility of wild salmon stocks across the U.S. Detrimental impacts on wild, native fish populations include the following:

- Studies have clearly shown that escaped farm salmon breed with wild populations to the detriment of the wild stocks and that diseases and parasites are passed from farm to wild salmon. Increased production of farmed salmon leads to greater escapes, which leads to a reduction. In some cases, it causes a more than 50 percent reduction in native species.
  - Ford, Jennifer S., and Ransom A. Myers. 2008. A Global Assessment of Salmon Aquaculture Impacts on Wild Salmonids. *Plos Biology* 6, no. 2 (February 12). <http://www.plosbiology.org/article/info%3Adoi%2F10.1371%2Fjournal.pbio.0060033> (accessed November 2, 2011).
- Recurrent sea lice infestations of wild juvenile pink salmon caused by salmon farms have reduced wild pink salmon populations and may result in their rapid local extinction. “It was observed that the mortality of pink salmon due to sea lice was more than 80 percent and surpasses previous fishing mortality. The findings suggest that salmon farms can induce parasite outbreaks that degrade the capacity of the coastal ecosystem to support populations of wild salmon.”
  - Krkošk, Martin, Jennifer S. Ford, Alexandra Morton, Subhash Lele, Ransom A. Myers, and Mark A. Lewis. 2007. "Declining Wild Salmon Populations in Relation to Parasites from Farm Salmon." *Science* 318, no. 5857: 1772-1775. Academic Search Premier, (accessed November 3, 2011).
- The productivity of native juvenile salmon was reduced by more than 30 percent in the presence of farm and hybrid juveniles. A 2003 study found that the lifetime success of hybrids was only 27 to 89 percent as high as that of their wild relatives. Seventy percent of the embryos in the second generation died. “These results provide strong evidence of how interbreeding might drive vulnerable salmon populations to extinction.”
  - R. Naylor, Kjetil Hindar, Ian A. Fleming, Rebecca Goldberg, Susan Williams, John Volpe, Fred Whoriskey, Josh Eagle, Dennis Kelso, and Marc Mangel. 2005. Fugitive Salmon: Assessing the Risks of Escaped Fish from Net Pen Aquaculture. *Bioscience* 55, no. 5 (May). [http://foodsecurity.stanford.edu/publications/fugitive\\_salmon\\_assessing\\_the\\_risks\\_of\\_escaped\\_fish\\_from\\_netpen\\_aquaculture/](http://foodsecurity.stanford.edu/publications/fugitive_salmon_assessing_the_risks_of_escaped_fish_from_netpen_aquaculture/)
- Threats to wild salmon populations are long-lasting and so severe that some researchers have concluded that: “escaped farmed salmon are sufficiently prevalent in eastern North American rivers to pose a potentially serious risk to the persistence of wild salmon populations, especially in those rivers that are adjacent to existing aquaculture sites.”

- Morris, R.J., Dylan J. Fraser, Anthony J. Heggelin, Frederick G. Whoriskey, Jonathan W. Carr, Shane F. O’Neil, and Jeffrey A. Hutchings. 2008. Prevalence and recurrence of escaped farmed Atlantic salmon (*Salmo salar*) in eastern North American rivers. *Can. J. Fish. Aquat. Sci.* 65 (September): pp 430.

## Endnotes

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- <sup>ii</sup> French, Edward. 2011. “Farmed salmon in rivers lead to call for closed containment.” *The Quoddy Times*. <http://quoddytides.com/salmon9-23-11.html> (accessed November 7, 2011).
- <sup>iii</sup> French, Edward. 2011. “Farmed salmon in rivers lead to call for closed containment.” *The Quoddy Times*. <http://quoddytides.com/salmon9-23-11.html> (accessed November 7, 2011).
- <sup>iv</sup> Atlantic Salmon Federation. “33,000 Farmed Atlantic Salmon Escape.” <http://www.asf.ca/news.php?id=617>. (Accessed November 3, 2011).
- <sup>v</sup> “100,000 Salmon Escape.” 2010. <http://www.thefishsite.com/fishnews/11892/100000-salmon-escape>. (accessed November 7, 2010).
- <sup>vi</sup> Grindheim, Joar. “Costly salmon escape.” *IntraFish Media*, October 15, 2010.
- <sup>vii</sup> “40,000 salmon escape B.C. farm.” 2010. *CBC News*. <http://www.cbc.ca/news/canada/british-columbia/story/2009/10/23/bc-salmon-farm-escape.html>. (accessed November 7, 2011).
- <sup>viii</sup> “Fish fears after sea farm escape.” 2009. *BBC*. <http://www.asf.ca/news.php?id=447>. (accessed November 8, 2011).
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