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Ms. Michelle Arsenault
National Organic Standards Board
USDA-AMS-NOP
1400 Independence Ave. SW
Room 2648-S, Mail Stop 0268
Washington, DC 20250-0268

Re. Handling Subcommittee (HS): BPA and Other Packaging Materials

These comments to the National Organic Standards Board (NOSB) on its Fall 2018 agenda are submitted on behalf of Beyond Pesticides. Founded in 1981 as a national, grassroots, membership organization that represents community-based organizations and a range of people seeking to bridge the interests of consumers, farmers, and farmworkers, Beyond Pesticides advances improved protections from pesticides and alternative pest management strategies that reduce or eliminate a reliance on pesticides. Our membership and network span the 50 states and the world.

Beyond Pesticides supports the elimination of bisphenol A (BPA) in organic food packaging. However, we caution that many substitutes pose similar or other hazards, so taking a piecemeal approach is likely to lead to greater disruption for organic processors. We support the approach of using the discussion document to alert processors to the problem and future restrictions on packaging materials.

Endocrine Disruption

Federal agencies have mostly been unable to deal with the most important danger posed by BPA –endocrine disruption. However, many scientists have been working in this area, and their work has been collected by some organizations –including The Endocrine Disruption Exchange (TEDX)[1] and the authors of *Our Stolen Future*.[2] *Environmental Health Perspectives*, a peer-reviewed, open access journal published by the National Institute of Environmental Health Sciences,[3] publishes many articles on endocrine disruption.

Endocrine disruption is the interference with the body's endocrine (hormone) system. Hormones are released by the body in tiny amount (parts per trillion) to serve as messengers that regulate the body's functions such as growth, response to stress, sexual development, and metabolism. Estrogen concentrations in adult premenopausal women ranges from 30 to 370

[1] http://endocrinedisruption.org/.
[2] http://www.ourstolenfuture.org/.
[3] https://ehp.niehs.nih.gov/.

ppt; in men it ranges from 15 to 60 ppt. Thus, it takes miniscule amounts of a synthetic material that acts like estrogen (xenoestrogen) or blocks estrogen receptors to interfere with the reproductive biology of a person. Children's exposure to minute quantities of endocrine disrupting chemicals (EDCs) during critical windows of vulnerability can have dramatic adverse effects on the development of organ systems and vulnerability to cancer and other diseases throughout life. The effect of extremely low-dose exposure to EDCs defies classical, dose-makes-the-poison" toxicology.

EDCs differ from other chemicals of concern in two important ways. First, the body does not respond monotonically to doses of EDCs –in other words, a lower dose does not necessarily have a smaller effect than a larger dose, but may be larger or smaller, or in a different direction. Second, the effect of an EDC depends on the timing of exposure as well as the size of the dose, and the effects may be manifested later in life. Because of these differences, the traditional methods of determining safe levels of exposures to chemicals do not work with EDCs.[4]

Bisphenol A

Endocrine disruption is not an incidental effect of BPA. BPA was first developed as a synthetic estrogen in the 1890s. BPA's activity in binding to estrogen receptors and producing estrogenic effects has been documented in laboratory studies. Other endocrine-disrupting effects have also been documented: as an antiestrogen and antiandrogen, both agonistic and antagonistic effects on thyroid function, and interactions with the developing central nervous system, pancreas, and immune system. Besides these laboratory results, research has linked BPA to many specific endocrine-related illnesses.[5] TEDX has collected references to studies of impacts of low-dose exposures to BPA.[6]

BPA in Cans

An investigation conducted by the Ecology Center (Ann Arbor, MI) and involving collaboration among six other non-governmental organizations in the U.S. and Canada looked at BPA and other materials used in lining food cans. It found BPA in the lining of 67% of the cans tested in both large and small brands. However, it also found, at the time of the study:[7]

- Amy's Kitchen, Annie's Organic (recently acquired by General Mills), Hain Celestial Group and ConAgra have fully transitioned away from the use of BPA and have disclosed the BPA alternatives they're using. No BPA-based epoxy resins were detected in any of the cans tested from these brands.

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[4] The Endocrine Disruption Exchange, 2011. Endocrine Disruption Factsheet. http://endocrinedisruption.org/assets/media/documents/EDFactSheet11-7-11.pdf.

[5] Rochester JR, Bisphenol A and Human Health: A review of the literature., *Reproductive Toxicology* (2013).

[6] http://endocrinedisruption.org/endocrine-disruption/bisphenol-a/low-dose-bisphenol-a-project/spreadsheet-and-references.

[7] Ecology Center, 2016. *Buyer Beware: Toxic BPA & Regrettable Substitutes in the Linings of Canned Food.* http://www.ecocenter.org/healthy-stuff/buyer-beware.

- Eden Foods reported eliminating the use of BPA-based epoxy liners in 95% of its canned foods and stated that it is actively looking for alternatives. No BPA epoxy was detected in the Eden canned foods that were tested.

BPA Alternatives

The study by the Ecology Center identified several alternatives to BPA that are in use. This is probably not a complete list.[8]

- Acrylic resins
    - Acrylic resins are hazardous to workers exposed in coating cans.
    - Acrylic resins contain styrene, listed as a "reasonably anticipated carcinogen" by the National Toxicology Program (NTP), as a possible carcinogen by the International Agency on Research on Cancer (IARC), and considered an EDC by the European Commission on Endocrine Disruption.
- Phenols other than BPA
    - BPAF is an EDC, with estrogenic, anti-estrogenic, and anti-testosterone activity.
    - BPAF may contain trimellitic acid, linked to adverse effects on immune system and lungs and melamine.
- Plant-based resins
    - Oleoresin and others likely derived from fir or juniper trees.
    - No reliable safety data.
- Polyester resins
    - Polyesters are generally stable and of low toxicity.
    - At least 19 chemicals may be added to the resins, with little safety data.
    - Melamine-formaldehyde is one possible cross-linking agent, and melamine may migrate to food.
    - Additives found in the European Union include tricyclodecanedimethanol, which shows some evidence of reproductive toxicity; isophorone diisocyanate, which may affect respiratory tract development through prenatal exposure; and tripropylene glycol, which may be linked to respiratory disorders and cancers of the lung.
- Vinyls
    - Vinyl acetate, classified by the International Agency for Research on Cancer (IARC) of the World Health Organization as possibly carcinogenic to humans, poses a hazard to workers because of acute irritation of the eyes and respiratory tract.
    - Polyvinyl chloride (PVC) is a polymer of vinyl chloride. Vinyl chloride exists as a monomer within PVC and leaches out. PVC's life cycle uses and releases a number of toxic chemicals, including chlorine gas, vinyl chloride, ethylene dichloride, mercury, chlorinated dioxins and furans, phthalates, lead, cadmium, flame retardants, BPA, PCBs, hexachlorobenzene and other chlorinated byproducts. In addition, PVC resins may contain a number of hazardous additives, including phthalates, organotins, lead, cadmium, chlorinated and brominated flame retardants, and BPA.

[8] Ecology Center, 2016. *Buyer Beware: Toxic BPA & Regrettable Substitutes in the Linings of Canned Food.* http://www.ecocenter.org/healthy-stuff/buyer-beware.

Conclusion

BPA poses serious hazards, and Beyond Pesticides supports its elimination from organic food packaging. At the same time, since known alternatives to BPA may also present similar problems, the NOSB should approach the issue of food packaging in a comprehensive way. We have only touched the surface of the problem in these comments, but we have also pointed to resources for the NOSB to explore.

We urge the HS to maintain packaging substances as a priority issue and strongly suggest that the NOSB inform its deliberations with a technical review on BPA alternatives as well as BPA itself. We look forward to future discussions of alternatives for addressing this issue in a timely manner.

Thank you for your consideration of these comments.

Sincerely,

Terry Shistar, Ph.D.
Board of Directors