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

Docket ID # AMS-NOP-20-0041

Re. HS: Ion exchange resins

These comments to the National Organic Standards Board (NOSB) on its Fall 2020 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.

We agree with the National Organic Program (NOP) that it is time to clarify the role that ion exchange resins should play in organic food processing. The NOSB should recommend that only resins and their associated recharge materials approved for this use should be allowed in organic food processing. Chemicals added during the ion exchange process must be listed on the label.

Ion exchange is chemical change.

As the HS states in its discussion document, "The NOP noted in the 2019 email, and other Materials Review Organizations have agreed, that the ion-exchange process is a chemical one and does affect the food in a way that chemically changes it."

Ion exchange is a reaction in which an element from the treated substance is removed and replaced by a different element. The most familiar example is water softening. Hard water contains calcium and magnesium in solution, which are considered undesirable because they can precipitate onto pipes and they destroy the surfactant properties of soap. A water softener

replaces calcium and magnesium cations and with sodium ions. The water coming out now contains sodium, which is more soluble, but may pose a health risk for some people.[1]

Ion exchange has many uses in food processing. In sugar production alone, it is used to soften sugar beet juice, demineralize sugar beet juice, remove color from cane juice, increase the yield of sugar from molasses, and convert sucrose into other sugars. It is also used to remove unwanted minerals, metals, acids, colors, tastes, and smells from other liquids like whey, juice, and beverages. It is used in purification of some products of fermentation (e.g., citric acid and amino acids).[2]

Ion exchange may introduce chemicals into food.

The HS states, "The FDA considers ion-exchange membranes and resins to be secondary direct food additives, since there is an effect on the food that is run through this process."

First of all, the chemicals exchanged for unwanted chemicals are introduced into the product. There are common problems that arise in the ion exchange process that can introduce other chemicals:

- Resin fouling, which requires the use of caustics or surfactants that may leave residues;
- Resin loss, resulting in leakage of resins—polymers that are not intended to be in food;[3]
- Increased corrosivity, leaching metals (iron, copper, chromium, etc.) from pipes, as well as contaminants (e.g., lead and arsenic) deposited on pipe walls;
- Leaching of components of resins (such as dichloroethene, sulfonated aromatic compounds; solvents, and oxidative byproducts); and
- Growth of organisms in the resin bed.[4]

In addition, in removing the targeted ions, the process may also remove desirable ions.

Ion exchange is not filtration.

Filtration is a physical process that removes insoluble components in a liquid. Ion exchange is a chemical process that removes soluble components.[5]

Ion exchange is a processing aid, not a food contact substance.

As explained above, ion exchange introduces new chemicals, and the resins and membranes are considered by FDA to be secondary direct food additives. Even if, as stated in the HS proposal, a secondary direct food additive may also be a food contact substance, the

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[1] Stephen Lower, 2007. "Hard water and water softening".

[2] François de Dardel, 2019. Ion exchange resins applications: A general overview. http://dardel.info/IX/applications.html.

[3] https://www.samcotech.com/common-ion-exchange-system-problems-how-to-fix/.

[4] Peter Meyers, 2018. Unintended consequences. https://www.wqpmag.com/resins-ion-exchange/unintended-consequences.

[5] Rohm and Haas, 2008. Ion exchange for dummies. https://www.lenntech.com/Data-sheets/Ion-Exchange-for-Dummies-RH.pdf.

more stringent requirements—that is, for secondary direct food additives—must be applied. The comments from OMRI quoted in the HS discussion document are worth repeating:

> Other processing aids that are considered secondary food additives required petitions in order to be considered. In addition to the filtering / clarifying / fining agents mentioned above, these also included the boiler water additives, antifoaming agents, and certain enzymes. Other additives that are considered 'de minimis' in conventional processing—such as disinfectants and atmospheric gases—also required petitions, reviews, and recommendations to be added to the National List. Ion exchange resins are known to leak from columns and thus become incidental additives in the food.

Conclusion

The NOSB should recommend that only resins and their associated recharge materials approved for this use should be allowed in organic food processing, and only when approved for listing on §205.605(b). Chemicals added during the ion exchange process must be listed on the label.

Thank you for your consideration of these comments.

Sincerely,

Terry Shistar, Ph.D.
Board of Directors