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October 12, 2016

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. HS: Agar-agar

These comments to the National Organic Standards Board (NOSB) on its Fall 2016 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.

In reviewing this substance, the NOSB must apply the criteria in the Organic Foods Production Act (OFPA), that its use—

- (i) would not be harmful to human health or the environment;
- (ii) is necessary to the production or handling of the agricultural product because of the unavailability of wholly natural substitute products; and
- (iii) is consistent with organic farming and handling.¹

Agar (or agar-agar) may be nonsynthetic or synthetic. Nonsynthetic agar is made from *Gelidium* species of seaweed. It may be pretreated with an acid (vinegar or a mineral acid) to improve penetration. Synthetic agar is made from *Gracilaria* species, which is subject to alkaline pretreatment to bring about a chemical change in the polysaccharides (L-galactose-6-sulfate groups are converted to 3,6-anhydro-L-galactose), producing agar with increased gel strength.

In the spring of 2016, the Handling Subcommittee (HS) concluded from the Technical Evaluation Report (TR) that a reevaluation of the classification of agar might be needed once the NOP finalizes the classification of materials guidance. We do not believe that the reevaluation must wait on the NOP's long-delayed guidance. The TR states:²

¹ OFPA §6517(c)(1)(A). Further details at OFPA §6518(m).

² Lines 202-209.

'Natural' agar refers to products sold in strips or squares that are produced on a small scale using traditional methods for extraction and freezing. First, the algae are boiled in water for several hours, sometimes in the presence of vinegar or dilute mineral acid. Then the extract is filtered through a cotton cloth and poured into wooden trays to cool. The resulting gel is cut into strips that are placed outside to freeze at night and thaw during the day, a process that may be repeated. Modern refrigeration is sometimes used as a substitute. Finally, the strips are dried and bleached in the sun. The agar-agar produced by this process has a weak gelling capacity and currently accounts for only ~1.5% of the world's production.

However, nonsynthetic agar also may be made by syneresis, which is:³

the separation of a liquid from a gel. During this process, mechanical pressure is applied to the agar-agar gels to increase the rate of separation. The polymer chains that make up agar-agar associate together and water is expressed from the gel. The resulting gels have an agar-agar concentration of about 20% making this method much more efficient than the freeze-thaw process.

The agar concentration from this process (20%) is about twice that of the gels made through the "natural" process (10-12%). The source for much of the information in the TR, McHugh (2003),⁴ may be helpful to the committee in checking its conclusions. It is clear that agar made from *Gelidium* species is nonsynthetic, while agar made from *Gracilaria* species is synthetic, and there is probably adequate production of nonsynthetic agar to meet the needs of organic processors.

Is there a need?

The TR states,⁵

Several agricultural products could be used as alternatives for agar-agar depending on the function required for a specific food application as well as compatibility with other ingredients.

Possible agricultural alternatives to agar-agar in food applications include (1) gelling agents, such as pectin high methoxy, gelatin, unmodified starches, and konjac flour, and (2) thickeners, emulsifiers, and stabilizers, such as vegetable gums (Arabic, locust/carob bean, guar), unmodified starches, tragacanth gum, konjac flour. All of these products are included on the National List as nonorganically produced agricultural products allowed as ingredients in or on processed products labeled as "organic" (7 CFR 205.606). Suppliers of organic forms of these products were found in most cases (as

³ TR lines 192-196.

⁴ 1 McHugh, D.J. 2003. Ch. 2 Seaweeds used as a source of agar and Ch. 3 Agar. In: McHugh, D.J. 2003. A Guide to the Seaweed Industry. FAO Technical Fisheries Paper No. 441. Food and Agricultural Organization of the United Nations, Rome, Italy. Available online at <http://www.fao.org/docrep/006/y4765e/y4765e00.htm>.

⁵ Lines 335-345.

noted below). Organically-produced forms of these products are only allowed when organic forms are not commercially available.

However, the HS conclusion of 2012, “Agar continues to be an important material used by the organic community,” should be re-evaluated in light of the information in the TR regarding alternatives.

What are the human health and ecological impacts?

The TR did not identify any adverse impacts on human health. However, it did identify ecological impacts, particularly with the synthetic form of agar. In addition, the 2016 TR on Marine Plants and Algae says, “In shallow waters, seaweed farms for *Gracilaria* or *Eucheuma* can result in additional damage through trampling and accidental damage. Physical shading of an area by seaweed farms can affect benthic communities and primary production in the water column.”⁶ As we stated above, synthetic forms of agar are produced from different species than those used for nonsynthetic forms. The ecological impacts identified in the TR come from the production of synthetic agar –both from overharvesting of *Gracilaria* and from alkaline wastewaters.

Is it consistent with principles of organic production and handling?

Assuming that the conclusions of the TR are valid, we find no areas of inconsistency with the use of nonsynthetic agar.

Conclusion

We support the continued listing of agar-agar on §205.605(a) Nonsynthetics allowed, with the annotation, “from *Gelidium* species, processed without alkaline pretreatment and sourced from areas managed for sustainability.”

Thank you for your consideration of these comments.

Sincerely,



Terry Shistar, Ph.D.
Board of Directors

⁶ 2016 TR on Marine Plants and Algae, lines 972-974.