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April 26, 2012

National Organic Standards Board
Spring 2012 Meeting
Albuquerque, NM

Re. Comments on Agar-agar

Dear Board Members:

These comments are submitted on behalf of Beyond Pesticides. 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, 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 groups around the world.

1. Synthetic vs. Nonsynthetic Agar

Agar (or agar-agar) may be nonsynthetic or synthetic. Nonsynthetic agar is made from *Gellidium* species of seaweed. It may be pretreated with an acid (vinegar or a mineral acid) to improve penetration. Synthetic agar is made from *Graciliara* 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.

The Handling Committee concludes from the Technical Evaluation Report (TR) that:

> While the Technical Review does list several methods of extraction, it does state that only 1 -2 % of the Agar- Agar supply is from the natural form of extraction. Furthermore, the product from the natural extraction method does not appear to be readily available in the U.S. market, or at least on a very limited basis.

We are not certain that the TR says what the committee thinks it says, and we ask that the committee recheck their conclusions. The TR states (lines202-209):

> 'Natural' agar refers to products sold in strips or squares that are produced on a small scale using traditional methods for extraction and freezing (McHugh, 2003; Imeson, 2009). First, the algae are boiled in water for several hours, sometimes in the presence of vinegar or dilute mineral acid (McHugh, 2003). 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 (McHugh, 2003). The agar-agar produced by this process has a weak gelling capacity and currently accounts for only ~1.5% of the world's production (Imeson, 2009).

However, nonsynthetic agar also may be made by syneresis, which is (TR 192-196):
"the separation of a liquid from a gel (McHugh, 2003). During this process, mechanical pressure is applied to the agar-agar gels to increase the rate of separation (Imeson, 2009). 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 195 (Imeson, 2009)."

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)[1], may be helpful to the committee in checking its conclusions. Agar made from *Gellidium* species is nonsynthetic, while agar made from *Graciliara* species is synthetic, and there is probably adequate production of nonsynthetic agar to meet the needs of organic processors.

2. Is there a need?

The TR states (lines 335-345),

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

However, the Handling Committee says, "Agar continues to be an important material used by the organic community." We would like to know how the committee has evaluated this need in light of the information in the TR regarding alternatives.

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[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.

3. 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. As we stated above, synthetic forms of agar are produced from different species from nonsynthetic forms. The ecological impacts identified in the TR come from the production of synthetic agar—both from overharvesting of *Graciliara* and from alkaline wastewaters.

4. 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.

5. Conclusion

We support the continued listing of agar-agar on §205.605(a) Nonsynthetics allowed, with the annotation, "from *Gellidium* species, processed without alkaline pretreatment." We oppose the proposed listing of agar-agar on §205.605(b) Synthetics allowed.

Sincerely,

Terry Shistar, Ph.D.
Board of Directors