HANDLING COMMITTEE

AGAR AGAR

EXECUTIVE SUMMARY

REJECT the proposal to move agar agar from 205.605(a) nonsynthetics to 205.605(b) synthetics. We **do not support** the listing of synthetic agar agar, from *Gracilaria* species, which undergoes alkaline pre-treatment.

SUPPORT relisting of agar agar on 205.605(a) non-synthetics, with the following annotation: "from *Gelidium* species only, processed without alkaline treatment."

- *Gelidium* species is the original species used for agar agar production. Another species, *Gracilaria,* must be treated with alkali to be a commercially viable alternative to *Gelidium*. *Gracilaria* processing requires more fresh water, and creates alkali wastewater.

AGAR AGAR

Cornucopia supports the relisting of agar agar on 205.605(a) non-synthetics allowed, with the annotation, "from *Gelidium* species only, processed without alkaline treatment."

We oppose the Handling Committee's proposal to move agar agar from 205.605(a) to 205.605(b) because synthetic agar agar is incompatible with principles of organic production and handling, for reasons outlined below.

It appears that non-synthetic agar agar from *Gelidium* species is readily available, and we have identified at least one U.S. supplier of non-synthetic agar agar from *Gelidium*.

Background: Synthetic v. Non-synthetic Agar Agar

According to the TR, two different species of red seaweed are generally used to produce agar agar: *Gelidium* and *Gracilaria*. *Gelidium* was the original species used for agar agar production, until shortages during World War II led to the discovery of *Gracilaria* as a suitable alternative to *Gelidium* (Imeson 2009).

However, *Gracilaria* is only suitable as an alternative to *Gelidium* **if it is treated with alkali**, which causes a chemical change that leads to increased gel strength (Imeson 2009, McHugh 2003, TR 174).

According to McHugh 2003, "this alkaline pre-treatment causes a chemical change in the agar from *Gracilaria*, resulting in an agar with an increased gel strength. Without this alkaline pre-treatment, most *Gracilaria* species yield an agar with a gel strength that is too low for commercial use."

The TR misleadingly states that "*Graciliara* [sic] species are usually subjected to alkaline pretreatment (heated in a sodium hydroxide solution)," when in fact commercially viable agar from *Gracilaria* ***must*** be treated with alkali before extraction.

This is an important distinction, which bears repeating because it is crucial in understanding the reason for our proposed annotation: Agar agar from *Gelidium* is not treated with alkali, and therefore does not undergo chemical change, while agar agar from *Gracilaria* requires alkaline pre-treatment and chemical change to be useful for commercial applications.

The Handling Committee may have misunderstood the TR, which misleadingly suggests that the only agar agar that is not chemically modified is "natural" agar in strip form, and that it only accounts for 1.5% of the world's supply. While it may be true that agar strips are produced on a small scale in China, Japan and the Republic of Korea, it is not accurate to suggest that the only form of non-synthetic agar agar is this "natural" strip agar.

When checking McHugh 2003 and Imeson 2009, the two main sources for the TR, it becomes clear that agar agar from *Gelidium* is available in food-grade powdered form. In fact, Imeson states that "the highest strength gel agar is generally obtained from *Gelidium* seaweeds" (Imeson 2009, page 32). The Handling Committee appears to have misunderstood the TR's estimate of supplies of "natural" agar agar in strip form as an estimate of non-synthetic powdered agar agar from *Gelidium.*

A quick Internet search for commercial supplies of agar agar from *Gelidium* in the U.S. yields at least one supplier: TIC Gums. TIC Gums produces two agar agar products it claims are "certified organic," and one TICorganic® Agar Agar 150-C FCC/NF is specifically listed as being from *Gelidium* species.

Suggested annotation

Cornucopia supports the relisting of agar agar on §205.605(a) Non-synthetics allowed, and opposes the proposal to list agar agar on 205.605(b). Only non-synthetic agar agar should be allowed in organics.

To clarify this, we urge the NOSB to adopt the following annotation for agar agar: "from *Gelidium* species only, processed without alkaline treatment."

Justification for suggested annotation

Because it is not treated with alkali, agar agar from *Gelidium* does not undergo chemical change and is therefore considered a non-synthetic (TR 216). The Organic Foods Production Act of 1990 (sec. 2111(a)(1)) and organic consumers have a clear preference for avoiding synthetics in the food supply.

The main environmental concerns pointed out in the TR include overharvesting (TR 299-300) and alkaline wastewater (TR 315-316). It appears that both concerns would be alleviated by restricting the use in organics to *Gelidium* agar.

Since only *Gracilaria* requires alkali pre-treatment, the concern with alkaline wastewater applies only to *Gracilaria* and not to *Gelidium*. And the TR mentions concerns with overharvesting only in regard to *Gracilaria*:

> "Buschmann et al. (2008) report that overexploitation of many wild *Gracilaria* strands has resulted in the destruction of some of the larger genetic reserves for the species." (TR 299-300)

Indeed, the University of Hawaii's Botany Department's database notes:

> *"Gracilaria coronopifolia*, like other *Gracilaria* species, is a hardy subtidal red algae that attaches to limestone or occasionally on basalt substrates. This species is one of the 10 most common intertidal algae in the Hawaiian islands. It is widely distributed and was fairly common, but **due to its popularity as an edible algae, has been seriously overharvested**. The invasive alien *G. salicornia* is now dominant in many regions typical of the native habitat for *G. coronopifolia."* (emphasis added)[1]

Another environmental concern that was not pointed out in the TR is the high consumption of fresh water, and accompanying creation of wastewater. According to McHugh 2003, non-synthetic agar from *Gelidium* requires less water:

> "A large and reliable freshwater supply is a requirement for an agar factory. **Water consumption is high and the processing of *Gracilaria* requires more than for *Gelidium***. Higher water consumption also means larger quantities for waste disposal, so recycling of water is becoming more necessary, depending on the location of the factory." (emphasis added) (McHugh, 2003)

McHugh also points out that there are many gaps in the understanding of how agar agar is produced, especially the conditions of the alkaline treatment. This lack of clarity and transparency is another reason to prohibit agar agar that has undergone alkaline treatment. McHugh notes:

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[1] http://www.hawaii.edu/reefalgae/invasive_algae/rhodo/gracilaria_coronopifolia.htm

"Detailed information on the commercial extraction process is not easily available. There are several short publications on the results from laboratory-scale extractions, but **commercial agar producers are generally secretive about the details of their processes**. Armisen and Galatas (1987) is one of the few publications that gives some details, but there are still many gaps, **particularly in the conditions of the alkali treatment** and the subsequent hot water extraction; nevertheless, it is the best starting point." (emphasis added)