

5-1-12

Dear National Organic Standards Board Members,

SunOpta Grains and Foods Group would like to support the Handling Committee's proposal to change the classification of carrageenan from nonsynthetic substances to synthetic substances and to relist carrageenan as a synthetic substance allowed for use in "organic" and "made with organic" products on the National List.

The wide spread use of carrageenan has been common throughout the food industry and in home cooking in regions such as Ireland for hundreds of years. It is very versatile hydrocolloid gum. It can be used to gel or to thicken depending on the type of carrageenan used, kappa, lambda or iota. Carrageenan is a hydrocolloid that gives a creamy smooth mouthful without being "slimy" as with other gums. It is extensively used in dairy products because of its unique interaction with dairy proteins; no other hydrocolloids have this ability. Carrageenan also reacts with calcium and potassium to produce specific gels and suspensions. This is especially important in analog meat and dairy products. Its general usage rate in products is extremely low in comparison to other types of other hydrocolloids as well.

There has been a lot of press indicating that degraded or low molecular weight carrageenans have been shown to be carcinogenic, but we believe that there is more to this story than has been clearly reported. Substances such as azoxymethane and N-nitrosomethylurea are commonly used by cancer researchers to induce cancer in lab animals. The molecular weights of these substances are 74 and 103 kDa respectively. These substances are derived from carrageenan, and this may be where some of the confusion arises.

In 2000, a study was done measuring the molecular weights of various carrageenans at the National Institute of Health Sciences in Tokyo, Japan. The findings of this study reported that samples of commercially available food grade carrageenans to have molecular weights ranging from 193,000 – 652,000 kDa, with no detection of poligeenans (carcinogenic low molecular weight carrageenans) at a detection rate of 5%.<sup>1</sup>

In another study by Marrs in 1998 at the Leatherhead Food Research Association looked at samples of food grade carrageenans after subjecting them to varying levels of temperatures, process times, pH and formulations that one might find in commercial food production, all be it very harsh conditions. There were situations in which a carrageenan could be hydrolyzed to be in excess of 25% by weight below 100,000 kDa. It is also mentioned within this report that maintaining pH systems above 4 and

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<sup>1</sup> Yoshitaka Uno, Toshio Omoto, Yasunori Goto, Iwao Asai, Mikio Nakamura and Tamio Maitani. Sa-Ei Gen F. F. I., Inc., Sanwa-cho 1-1-11, Toyonaka, Osaka 561-8588, Japan; National Institute of Health Sciences, Kamiyoga 1-18-1, Setagaya, Tokyo 158-8501, Japan.

controlling the temperature and time of heat treatments, as referred to by the carrageenan manufacturer's recommendations of process conditions, is important and should be closely monitored and maintained.<sup>2</sup>

The SunOpta Grains and Foods Group feel that it is also important to point out that Marinalg International, an international association to promote the use of seaweed-derived hydrocolloids, states that the absolute lowest molecular weight capable of forming a recognizable gel (by instrumentation only) is 40,000 kDa and an actual perceivable textural difference is found at 180,000 kDa. Below this level carrageenan gels lack structural integrity, the short molecular chain lengths interfere with the creation of an effective three dimensional gel network.<sup>3</sup>

While there certainly could be a gray area between the "known to be carcinogenic" levels of poligeenans with a molecular weight of 74 and 103kDa and the 40,000 and 180,000 kDa levels that are needed to produce a minimally functional ingredient usable in food systems, SunOpta believes that it would be premature to delist carrageenan at this time, based on the research available today.

In conclusion, while SunOpta certainly does support continued research into public health concerns, we do not want to compromise the quality, flavor or experience of consuming organically certified foods without first unequivocally proving that there is sufficient reason to do so.

Sincerely,

Heather Ganske  
Technical Services  
SunOpta Grains and Foods Group

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<sup>2</sup> Marrs. W.M. (1998) The Stability of Carrageenan in Processing eds P.A. Williams and G.O. Philips Gums and Stabilizers for the Food Industry. 9 345-357.

<sup>3</sup> [http://www.marinalg.org/PDF/CGN-PES\\_monograph\\_November\\_2006.pdf](http://www.marinalg.org/PDF/CGN-PES_monograph_November_2006.pdf)