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The Carrageenan Diet: Not Recommended

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We read with great interest and concern recent reports of the spread of carrageenan-producing seaweeds in coral reefs in the Bay of Bengal, as well as in Butaritari, Kiribati, and other Pacific atolls [“Seaweed invader elicits angst in India,” P. Bagla, *News of the Week*, 6 June, p. 1271, and (1)]. The bio-invasion of carrageenan-producing, coral-destroying algae in remote Pacific atolls and marine reserves in the Gulf of Mannar Marine National Park is unfortunately a metaphor for the invasiveness of carrageenan in the Western diet and in other commonly used products. Although carrageenan exposure has been associated with development of inflammation in experimental models for decades (2), its use in processed foods (including infant formula and nutritional supplements) and other manufactured products (including pharmaceuticals, cosmetics, and toothpaste) continues to increase. In view of uncertainty about the safety of consumption of carrageenan-containing products, the efforts to cultivate carrageenan-producing seaweeds seem ill-advised.

At its 68th meeting in June 2007, the Joint Expert Committee on Food Additives (formed by the Food and Agriculture Organization of the United Nations and the World Health Organization) advised against the continued use of carrageenan or processed Eucheuma seaweed (PES) in infant formulas (3). It also recommended a new dietary exposure evaluation of carrageenan intake, noting that previous estimates of carrageenan intake might be outdated. Also, the Scientific Committee on Food of the European Commission advised and the European Commission adopted the recommendation that the content of carrageenan of size less than 50,000 Da in food products should not exceed 5%, if feasible (4). In response to this, carrageenan manufacturers performed round-robin testing of food-grade carrageenan and PES samples and found >5% content over 50,000 Da, as well as marked variation in their determinations (5). We have published several reports about carrageenan-induced effects on human colonic epithelial cells in tissue culture and in ex vivo human and mouse colonic tissues. We also published a review of the harmful effects of carrageenan in many animal experiments (6–10).

With these considerations in mind, we are concerned not only about the extraordinary overgrowth associated with the attempted cultivation of carrageenan near the Gulf of Mannar Marine National Park and in Pacific sites, but the thinking associated with the spread of the use of carrageenan in products for human consumption and the increased dependence on carrageenan farming in developing economies, as in Indonesia and the Philippines. The efforts at cultivation of carrageenan-producing seaweed have demonstrated how a natural product can produce harmful effects to the marine environment; similarly, harmful effects to humans may be attributable to carrageenan exposure.

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