

Star Trek, synbio and sustainable food: Will Friends of the Earth and other activists block the future?

Counselor Deanna Troi from *Star Trek: The Next Generation* will always be remembered for her ritualistic habit of eating chocolate sundaes. After a long day's work serving on the USS Enterprise under Captain Picard, she'd take to her room or the Ten Forward lounge and order herself the fudge-topped dessert, which was then synthesized on command by one of the many food "replicators" aboard the ship.

Trekkies might've also wondered if Troi ate anything else. She must've, right? Or was it by some special half-Betazoid metabolism that she was able to maintain her figure? Another theory is that the food replicator itself adjusted her favorite treat with perfectly portioned calories and nutrients that fit her body's needs. Can you imagine? Any food you crave synthesized immediately and without risk of weight gain or the emotional guilt?

Besides making chocolate sundaes, food replicators are also credited with another underlying setting of Star Trek: The end of hunger, poverty, and laborious work such as farming (unless it's taken up as a traditional pastime). When food is made out of thin air—now that's sustainability. Star Trek is science fiction, of course. The world's reality is quite different. A simple creation of a chocolate sundae depends on an entire food system. To supply each ingredient—the dairy-based ice cream, the chocolate, the sugar, the flavorings (be they "artificial" or "natural")—there are a tremendous amount of steps: sourcing, processing, quality testing, manufacture, packaging, finished product evaluation, and transport to name a few. The same goes for nearly any dessert today, or for that matter, any meal.

We're far from reaching the point of having instantaneous synthesis of food on command, but advances in science and technology do offer a glimpse of a possible food replicator-like future. Synthetic biology paired with genetic engineering is one of those areas of study showing the [most promise](#). Synbio projects have abounded over the last few years in [food production](#). These include those projects where genes from plants are inserted into bacteria or yeast that's then fed sugar to produce a chemical substance to be used in food. Essentially, it's making food additives, food flavors, or even nutrients like vitamins or amino acids out of sugar.

These projects — along with others such as 3-D digital printing and synthetic meat production — offer the large promise of making food more sustainable. However, just as with genetic modification technology, synbio as a technology already has its enemies in the form of groups like Friends of the Earth (FOE), Non-GMO Project, and the Consumers Union that are spreading mistrust surrounding their use.

An example of synbio being unfairly attacked by these anti-biotechnology groups is the controversy over synbio vanillin, the food flavoring that would be used in products in ice cream for chocolate sundaes. Biotechnology company [Evolva](#) uses a synbio process for a more sustainable, less expensive, and faster production of food ingredients including vanillin, the food flavoring. The company also makes resveratrol, the red wine-derived dietary supplement, and saffron, the spice.

The company's process of using synthetic microbes is not unlike current methods of microbial

fermentation of vitamins or “artificial” and “natural flavors” that have already been in use over the last quarter century by the food industry. Nor is Evolva’s process unlike [brewing beer](#) where the chemical substance of choice is alcohol; or culturing milk with lactic acid bacteria in the production of yogurt. Even the Food and Drug Administration’s current standards determine that they can be labeled as “natural.” After all, the yeast or bacteria produce the same identical chemicals that would’ve been otherwise produced by plants.

But anti-biotechnology groups like Friends of the Earth (FOE), Non-GMO Project, and the Consumers Union, a public policy arm of Consumer Reports, take issue with synbio products calling it an “extreme” form of genetic engineering. These groups also reject any suggestion that synbio vanillin as a food ingredient is “natural,” “sustainable,” or “safe.” Last year, in fact, FOE and its allies sent a letter to several major ice cream companies demanding that they not use synbio vanillin in their products. Never mind that the synbio process avoids entirely the necessity of growing, harvesting, and transporting plants, and then extracting those same chemicals from the plants and tossing waste, which makes synbio vanillin easier to produce, ship, cheaper, more sustainable, or “earth-friendly” by comparison.

When Häagen-Dazs (produced by Nestlé in Canada and the U.S., and General Mills outside the U.S.) reported that it wasn’t using Evolva’s synbio vanillin in its products, FOE put out a news release with this statement by campaigner Dana Perls:

“Häagen-Dazs and other leading ice cream companies are doing the right thing by listening to the growing number of consumers who don’t want synbio vanilla and other extreme GMOs in their foods. Unilever and other companies using and investing in synbio ingredients must follow suit and give consumers what they want: transparency and responsible sourcing of truly natural, sustainable, non-GMO ingredients.”

Among food industry experts, the news release raised suspicions that the letter was nothing more than a [public relations stunt](#) considering that Häagen-Dazs had never used synthetic vanillin in the first place. That explained why the company responded that it had “no plans” to use synbio vanillin either. The company had already long committed to using only Madagascar-sourced natural vanilla extract (from vanilla beans) for its ice cream products.

Stunt or not, however, FOE continued to influence its allies into coming up with their own anti-synbio initiatives. Following FOE’s lead, the Non-GMO Project has [recently announced](#) that Evolva’s vanillin or any synthetic biology ingredient would not meet its seal of approval for use in “non-GMO” foods. It’s a blow to companies like Chobani, for example, that might’ve benefited from the cheaper ingredient for use in its non-GMO yogurt products. In response to the news, Evolva’s vice president of strategy and public affairs Stephan Herrera told [Food Navigator](#):

Well, I guess this decision removes any remaining doubts about whether certification is based on food politics or food science.

And conveniently enough for those of us who already had our suspicions about this group’s agenda, they actually rationalized their new rules around yeast in a press release put out by the same anti-biotech pressure group that is behind the H

äagen-Dazs hoax.

If a minor flavoring ingredient of ice cream generates this much upheaval, one can only speculate how these anti-biotechnology groups would react to Deanna Troi's wholly synthetic replicator-created chocolate sundaes. Questions should be raised about whether Friends of the Earth and its allies truly believe in the objectives of sustainable sourcing of food ingredients. Because as quick as synbio food ingredient projects come [under development](#), these organizations will need to come to terms with the fact that this technology could make foods more environmentally friendly, affordable and accessible for all.

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