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Is 3-D printing the future of global food?

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A few weeks ago, Londoners were able to eat at the world's first 3D-printed pop-up restaurant. In early June, a German-based company introduced the word's first plug-and-play food printer, which may be ready for shipping as early as next year. With the cost to produce this technology dropping, making it increasingly accessible, 3D printing could fundamentally change our relationship with food.

Simply put, the process uses ingredients to generate three-dimensional meals by placing layers of compounded food on top of each other. Since 2012, the food industry has used this technology to produce products, including candy, chocolate, pizza, noodles and even crackers. Despite its relative novelty, many companies are recognizing its potential – and recognizing how 3D food printing can revolutionize our global food systems.

In particular, 3D printing could radically alter food production practices by enabling companies to manage resources more responsibly and reduce waste across the food continuum – whether you are a processor, a distributor or a consumer with leftovers. Indeed, many well-known agribusiness corporations have already dedicated a great deal of time and research on 3D systems. There is a potential benefit to consumer health, as well. For example, PepsiCo recently announced that it is using 3D printing to develop a healthier potato chip.

Beyond manufacturing, 3D printing could also boost culinary creativity by allowing renowned chefs to create shapes and forms that were previously thought impossible. Some have argued that it can give the food-service industry the ability to customize products based on individual nutritional needs.

Given the demographic challenges we face in coming decades, this can become a key benefit. In Germany, many nursing homes already produce a pureed 3D-printed food product called smoothfoods to residents who have difficulty ingesting food, or even chewing them. Regular smoothies have been on the menu, but haven't proved as popular. Elderly residents eating smoothfoods can receive all the nutrients they require while enjoying an aesthetically pleasing meal. As a result, they can live healthier, higher quality lives.

More significantly, some experts believe 3D printing could effectively address global food security challenges. Ingredients such as algae, duckweed and grass could be imbedded into familiar dishes. A recent study in Holland added milled mealworm to a shortbread cookie recipe through 3D printing – most would agree that a cookie-shaped food product is much more appetizing than the look and feel of a worm. By using insects and other protein sources, the growing need for protein the globe is currently experiencing, which adds increased pressure to beef and pork prices, could be mitigated.

3D food printing does still face major obstacles. The technology remains expensive and complex. The engineering required to produce food is much more sophisticated than producing objects with metal and plastic. Food scientists acknowledge how difficult it is to effectively make edible meals in 3D food printing – ingredients in food interact in many complex ways, particularly with meats. At this point, 3D food printers are not known to produce great tasting food, and still do not have the overwhelming endorsement of the culinary world.

However, the technology is improving at an incredible pace, allowing us to believe that very soon, anything might be possible.

The concept of 3D printed food is foreign to many of us, and may challenge our collective appreciation of where food comes from, and how it is produced. Let's face it – when it comes to food, we are all traditionalists to some extent, protective of our food heritage. Printing food is a drastic departure from the art of cooking as a way of celebrating nature's bounty.

But the reality is that in just a few years, we will have more than nine billion people to feed. One way to responsibly address global food security challenges is to consider technology as a primary source for sustainable solutions. Treating alternatives to established food production systems as mere fads may not be the best approach.

After all, the future of the dinner table may be as different, and as simple as "Press print and eat."

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