

44. A New Prototype of a Food 3D Printer

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Introduction. Scientists at Cornell University's Computational Synthesis Lab are developing a commercially-available "3D food printer" that would allow users to "print" meals using "raw food 'inks'" inside syringes. Sounds Delicious!Cooking is so hard, what with "ingredients" and "recipes" and "having to leave your house to go shopping." So thank goodness for the fab@home project, an open-source collaboration on 3D printer technology that's developing a "food printer" intended for home use. The BBC is very excited:Just pop the raw food "inks" in the top, load the recipe - or 'FabApp' - and the machine would do the rest."WebApps would allow you to tweak your foods taste, texture and other properties," says Dr Jeffrey Ian Lipton, who leads the project."Maybe you really love biscuits, but want them extra flaky. You would change the slider and the recipe and the instructions would adjust accordingly."Currently, the food printer's "inks" are limited to "anything that can be extruded from a syringe" (luckily that includes the four major food groups: Liquid chocolate, liquid cookie dough, liquid cheese, and liquid cake batter). But the team is working on turning other ingredients into syringe-extrudable materials—and they've had some successes, like cookies, and chocolate, and, oh my God, "designer domes made of turkey meat."And there's nothing weird about that at all! No, nothing completely and utterly horrifying about the fact that the endpoint of technological modernity is our food being squeezed out of a syringe in prearranged patterns. If anything, this will improve The Food Experience, according to chef Homaro Cantu of Chicago's Moto, who has, and you may want to get a vomit bag here, "printed sushi using an ink jet printer":More exotic topics are emerging within the 3D printing industry, and printed food certainly cuts the mustard in the race for raising the attention – literally. This week we learned that the billionaire Peter Thiel is making a donation to a new start up Modern Meadow with a goal to develop bio-printed food products, namely meat. Along these news came that Google is now providing 3D printed pasta for their employees in their headquarters.Modern Meadow, the company with ambitious plans on offering us ethically produced meat is already planning their first steps in this foray. The first challenge is to “fabricate 3D cellular sheets composed of porcine cells” and then allowing those sheets to mature into muscle tissue inside of a bioreactor with electrical stimulation inside. In more common terms, their first menu item we should expect to see is minced animal muscle strip which can be used as a patty for burgers or sausages.Bio-printed food such as meat does have interesting opportunities ahead as growing meat in its

organic means is very resource intensive and the developing countries are acquiring a taste for it in increasing number. Bio-printed food can also provide an alternative option for people who are not currently eating meat products for religious reasons. Modern Meadows is in fact planning to market their initial offering to different religious groups hungry for animal protein. Moving back on the menu, we saw Google who is known for offering their employees many culinary feats in their multitude of onsite cafeterias, providing interesting technological advances in their kitchen. Bernard Faucher, chef that works the Google HQ, came up with the idea of cooking custom designed pasta for the employees using 3D printers. According to Faucher, everyone has their favorite shape of pasta and the Chefs can now produce the food according to Googlers' individual taste. Perhaps the two companies can join forces and come up with the first restaurant offering a menu of full of 3D printed delicacies. Certainly in the case of Google, we hope they will stick with providing us with the search results on how to find one.

NASA Funds 3D-Bio-Printer Development to Combat Universal Hunger

In a fantastic development, the application of additive manufacturing technologies that other 3D printing enthusiasts and myself have long been promoting, NASA has recently awarded a \$125,000 grant to further explore and develop the application of 3D printing food for astronauts. Initially aimed at efficient food storage for long-haul space flights, the creator of this project – Anjan Contractor, a Senior Mechanical Engineer at Systems and Materials Research Corporation (SMRC) in Austin, Texas, USA — hopes this technology could ultimately help the continually exponentially increasing population on Earth. In the plan, a NASA-modified RepRap printer will be fitted with several culinary building blocks, from oil to protein powder, then mixed and deposited. As 3D printing typically utilises a layer on layer based methodology, layer-based foods like pizza are first on the menu. Accordingly, Contractor envisions: “customized, nutritionally-appropriate meals synthesized one layer at a time, from cartridges of powder and oils.” So for the pizza, the 3D printer would mix the appropriate ingredients to deposit a layer of dough, which would be ‘cooked’ prior to laying down the next of tomato sauce (from a mixture of powder, water and oil. Additional layers of protein can then be added. Contractor believes a 3D printer could be in every cooking area though, not just those in space; indeed in the most needed areas on Earth, given that hundreds of millions people still live in permanent hunger within our currently imbalanced, but improving, world socio-economic and political system: where rich nations contend with obesity, whilst poor nations contend with starvation.

Conclusions. Food distribution is more the problem than food production, the climate chaos that the majority of specialist scientists unequivocally support by observation (this week's tragically catastrophic hurricane near Oklahoma is part of the increased prevalence of such super-storms and other threatening atmospheric phenomena; and the mass failure of crops in the

US last year, and these are two indications that natural ecological cycles are disturbed – with man-made climate change being present among natural differentials: from solar cycles and terrestrial hydrosphere, chryosphere, and biosphere cycles.)3D printing is a technology versatile enough to be incorporated into cooking. Indeed, some are speculating, albeit non-empirically at this point, that it could even replace it entirely!

References

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