Appendix A: Lists of 3D food printers and 3DFP companies

Table 6: List of 3D food printers purposefully developed for printing food materials

Most of these printers are commercialised, but their level of commercial success differs and is unpredictable at present as the market is just emerging. Note: 2D printers, such as PanCakebot or Pancake printer by Zbot are not included in this list.

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Company name and printer models	Food types	Capability/ USP	Commercial status
Choc Edge (UK) Choc Creator V2 Plus (earlier models)	Chocolate	Syringe loading system: users must manually insert tempered and heated chocolate into the 3D printer's 30-mL syringe. Company also offers bespoke printing services.	Dissolved in Nov 2021 (Was fully commercialised)

Company name and printer models	Food types	Capability/ USP	Commercial status
chocolate[3] (Germany) Choc-Mate	Chocolate	Advanced temperature control, company offers pre-tempered chocolate sticks to go with printer. Kickstarter project 2021 (26 backers pledged EUR 38,878 (of EUR 15,000); Company offers bespoke printing services	Fully commercialised
Felix Printer (NL) SINGLE , TWIN and SWITCH food 3d printers	Pastes, Chocolate, Purées, Meats	Single food printer can extrude 1 type of food, twin food printer extrudes 2 foods simultaneously and SWITCH allows to switch between 2 foods.	Fully commercialised

Company name and printer models	Food types	Capability/ USP	Commercial status
ByFlow (NL) Focus	Various	This food 3D printer mostly targets professionals in the bakery industry; refillable cartridges containing any sort of paste-type food; access to downloadable recipes; Not exclusively food, also thermpolastics (e.g. PLA), ceramic; company holds patent for print head; Company also works with Verstegen Spices & Sauces B.V. – in 2019 the companies announced a partnership where Verstegen would deliver the food inks and ByFlow the printers. “Buyers will initially have the following choices: Beetroot with cardamon, Hollandaise, and curry with ginger”.	Fully commercialised

Company name and printer models	Food types	Capability/ USP	Commercial status
Shiyintech (China) Foodbot S2 Foodbot D2	Chocolate and other (e.g. toffee, cream, mashed potato)	S2 is a single extrusion model, D2 can print two materials concurrently. Company stresses hygiene: Food filament never touches the printer as it comes in disposable plastic dispenser.	Fully commercialised
Natural Machines (Spain) Foodini	Various	Allows printing with up to 5 cartridges at the same time. Allows creation of complex foods (jelly, pizza, spaghetti, “all the way up to a burger”); Company works with Nestlé and PepsiCo; holds patents on food heating method using lasers.	Fully commercialised (available to rent & purchase from website)

Company name and printer models	Food types	Capability/ USP	Commercial status
Print4Taste (previously: Print2Taste) (Germany) Mycusini 2.0 Procusini 5.0 Previously: Bocusini	Mycusini: chocolate Procusini: chocolate, marzipan, pasta	Mycusini is a home chocolate printer that works with included special tempered chocolate refills. Procusini is a professional model currently only sold B2B. Company also offers 3D printing services on website; IP on printer and food compositions	Fully commercialised
La Pâtisserie Numérique (France) Cakewalk (attachment) Patiss3	Not specified	Cakewalk in an extruder system that can be fixed to a variety of 3D printers. Patiss3 is a purpose designed food 3D printer based on cakewalk. Company also offers courses in 3D printing for pastry.	Fully commercialised

Company name and printer models	Food types	Capability/ USP	Commercial status
Wiiboox (China) Sweetin LuckyBot (attachment)	Chocolate, mashed potato, fruit jam, bean paste, other	Wiiboox offers 3D printers for a variety of materials. LuckyBot is an attachment that can be installed on most FDM/FFF printers (incl. Creality, Ender, and others) in order to extrude different food types. Wiiboox clients include P&G and Jaguar. Sweeting is a purpose designed food printer with 100 micron precision.	Fully commercialised
Mmuse (China) Desktop/Touchscreen 3D printer	Chocolate	Uses solid chocolate beans as 3D printing input material.	Available online via edprintersonlinestore.com

Company name and printer models	Food types	Capability/ USP	Commercial status
Beehex (USA) 3D Dessert decorator Cake Writer Pro™	Cake decoarations	Company offers a range of small to mid-sized 3D cake decorators for businesses; 3D Dessert decorator is specifically for bakeries to streamline production – six colours per design. The Cake Writer Pro™ is thought to be placed inside a shop for customers to print their own cake decorations.	Fully commercialised
Ningbo Createbot Technology Co (China) 3D food printer (not on market any more)	Chocolate, biscuits, bean pastes, other food	3D food printer, no evidence of this any more on current company website.	Not on market any more
CURRANT 3D Printer	Sugar	Designed for professional food manufacturers. The company started off as “Sugarlabs”, was then bought by “3D Systems” and recently sold back again to former “Sugar Labs” founders who have since developed it further.	Fully commercialised

Company name and printer models	Food types	Capability/ USP	Commercial status
ChocoL3D (Ukraine) ChocoL3D Kit (attachment)	Chocolate	small attachment for chocolate extrusion to fit a variety of 3D printers.	Currently not on market
Structur3D (Canada) Structur3D Discovery Paste Extruder (attachment)	Various pastes	A universal paste extruder for desktop 3D printers. This extension was a Kickstarter project in 2014 and raised CA$ 126,086 from a pledge of CA$ 30,000 goal.	Was commercialised, currently not on market
Foodjet (NL) High speed 3D chocolate printer	Chocolate	Foodjet already offers depositing technology for decorations. The company showcased a standalone 3D chocolate bar printing system capable of producing large numbers of products.	In development

Company name and printer models	Food types	Capability/ USP	Commercial status
Cocoa Press (USA) 3D chocolate printer	Chocolate	Temperature controlled enclosure, dynamic touchscreen and food safe steel extruder that supports printing with any chocolate. Price on website relatively expensive (USD 9995).	Commercialised

Table 7: Other 3D food printers which have been developed, but where there is currently no evidence of commercial activity.

No recent media or press releases. Some only have demo videos and there is no indication that they have been on the market.

Company name and printer models	Food type	Capability/ USP	Commercial status
Chocoformer (Switzerland)	Chocolate	n/a	No evidence of commercialisation
Shoggi Print (Switzerland)	Chocolate	n/a	Company claimed printer will be available in Feb 22, but no evidence of commercialisation yet
Chocola3d (Ukraine)	Chocolate	Offer services, unclear if their own printer was ever commercialised	No evidence of commercialisation

Company name and printermodels	Foodtype	Capability/ USP	Commercial status
ChefJet (USA)	Sugar	Was developed by 3D systems using Sugarlab's technology. Many press releases going back to 2013/14, however no evidence of it being on the market.	No evidence of commercialisation

Table 8: List of 3D printer companies which have experimented with food printing, but do not have purposefully designed food printers on the market at the moment.

Company name and printer models	Food type	Capability/ USP	Commercial status
Zmorph (Poland) Zmmorph i500, Zmorph VX, ZMorph Personal Fabricator 2.0 SX	Not specified	Currently on Zmorph Fab and Zmorph i500 website (company also produces Zmorph Shape, a vacuum former). While occasionally listed as a food printer , Zmorph do not certify that the printer's food prints are edible or take any accountability for that.	Fully commercialised, but currently not for food use
Wasp (Italy) Wasp2040	Not specified	Company experimented with food, e.g. preparing gluten free food . Also used for food packaging (cups) at an exhibition, but no commercial food printing model available.	Fully commercialised, but not for food use

Company name and printer models	Food type	Capability/ USP	Commercial status
ChefJet Cocojet	Sugar	Company had bought “Sugarlab” and then created ChefJet, but no evidence that this was ever fully commercialised. Sugarlab’s founders have now bought back technology and created CURRANT 3D Printer. CocoJet is a 3D printer that was showcased in 2015 together with Hershey’s, but no evidence of commercialisation.	No evidence of any significant number being sold (if ever).

Table 9: Well-known food companies and other large companies using 3DFP. Some may not have unveiled and/or commercialised a printer, but all companies have expressed that they are working on food printing concepts. Only a couple of large players have an active project (e.g. Barilla).

Company name	Food type	Capability/ USP	Commercial status
Barilla (Blue Rhapsody)	Pasta	3D printing of pasta – service offered to professionals (e.g. restaurants), some shapes available for general consumers. Technology was developed in collaboration with TNO (NL).	Commercialised
Mondelez (Cadbury) & 3P Innovation (UK)	Chocolate	K company 3P innovation worked with Mondelez to develop a 3D food printer “to develop a new way to manufacture Cadbury Dairy Milk. The multi-lane technology can print a range of chocolate shapes and sizes, without using a traditional moulding process”.	No evidence of commercialisation

Companyname	Foodtype	Capability/ USP	Commercial status
Nestlé (Switzerland)	Various	In 2014, press release that “Nestlé wants to meet dietary needs with 3D food printing” described research into personalized nutrition (“Iron Man Project”).	No evidence of commercialisation
Katjes (Germany)	Gums	Katjes developed a “Magic Candy Factory” – a gummy 3D printer which was aimed to be released in the US, UK and Germany by 2016. The printer would have taken about 5 minutes to create gummy candy between 15 g and 20g; The company filed a patent on this.	No evidence of commercialisation
Frito Lay (USA)	Potato chips	IP in 3D food printing (WO2022076368A1). Article in press suggests 3D printed potato chips – no further evidence found.	No evidence of commercialisation
Barry Callebaut (Switzerland) (Service available in UK according to website)	Chocolate	Claim to operate the “first chocolate 3D-printing studio in the world” . say they use the “same chocolate couvertures preferred and used by the world’s most renowned pastry chefs and chocolatiers.” – and deliver to the doorstep. Service available in UK according to website.	Commercialised?

Table 10: Startups - small concept companies.

Company name	Food Category	More info	Commercialisation / Funding
Gastronology (NL)	Food for dysphagia patients	Aim to sell food printers & printed food into hospitals and care homes etc. for dysphagia patients.	Pre-commercial

Company name	Food Category	More info	Commercialisation / Funding
Remedy Health/ Nourished (UK)	Personal nutrition	3D printing of personalised supplement gums, claim “patented vegan encapsulation formula” and “able to combine 7 active ingredients from 28 choices".	Commercial; In 2020 achieved the largest-ever seed round by a female founder in the UK, £1.95 million. In 2021 raised £8 million in Series A funding after seeing the company’s revenues grow by more than 600% over the previous year.
Upprinting Food (NL)	Food waste	3D printing food from retail food waste.	Unknown
Foodink (UK)	Various	This was a one -off event (25-27 July 2016) with a subsequent “world tour” but seemed to have seized to exist.	One- off, no more updates
Fab Café (Japan)	Chocolate	In 2013 a press article suggested that for 6,000 Yen (£40), you can have your head scanned and turned into a 3D digital model, which is then printed in plastic in high definition on a ProjetHD printer. A silicon mould is made from this positive form and filled with melted chocolate – and the final product can be gifted in a box of chocolates.	No recent evidence of this service
Chocolate3.de (Germany)	Chocolate	Company developed printer in 2021 (Kickstarter project), but also offers services in printing bespoke chocolate shapes.	Fully commercialised

Company name	Food Category	More info	Commercialisation / Funding
3D Chef (NL)		This company started with 3D food printing, but now focuses on producing customised moulds for foods. Website states “Before, moulds, thermo-forming, pastry competitions and stencils, 3DChef was pioneering 3D food printing. This is not to say we no longer have an interest in the area, its only that the area did not go the way we would have liked it to. I still see areas of development and some of those we are working on behind the scenes. My focus was always on production environments and not desktop dinky units."	Ceased operations in 3D food printing, now focuses on producing moulds.
La Miam (Belgium)	Chocolate	Relatively small company, specialising in customised chocolates. The company also offers laser engraving in macaroons.	Fully commercialised

Company name	Food Category	More info	Commercialisation / Funding
Open Meals (Japan)	Sushi	Sushi restaurant 3D printing sushi; Wants to engage in developing printer / software, making the actual printed food and selling it to customers in restaurants. Claims production of food ingredient cartridges. These contain sustainable food ingredients, such as seaweed and crickets, which are mixed with water, fibre, and enzymes for printing; On website company claims: "cell cultured tuna" and "powdered sintered uni" or “selective laser sintering of sea urchin powder and rice flour”; "Development of the world's first operating system to design food digitally is underway"	Operating company, unclear about state of commercialisation
Babinese Lollipops (France)	Lollipops	A shop in Paris using Ultimaker for printing Lollipops.	Ceased operations
Smart cups (USA)	Drinks in cups	This is referred to as “3D printed”, however, in an interview the founder declared it was not actually 3D printed. Beverage powder is printed into cups, so users only have to add water for soft drink.	Commercialised, products available from website
Sugar Lab (USA)	Sugar	Offering bespoke items created by binder jetting technology. See information on Chefjet and CURRANT 3D printer	Commercialised

Company name	Food Category	More info	Commercialisation / Funding
Novameat (Spain)	Plant based meat alternative	NOVAMEAT produces plant-based meat substitutes through advanced food printing and tissue engineering technologies. In 2022 Novameat secured $6 million pre-Series A funding.	Commercialised
Revo Foods (formerly Legendary Vish) (Austria)	Plant based seafood alternatives	Company claims plant based seafood produced with 3D food printing. There are questions whether this company uses “real” 3D food printing. Claim products are available in Austrian supermarkets and also in the UK.	Commercialised
Steakholder Foods (formerly MeaTech 3D) (Israel)	Cultured meat	With proprietary 3D bioprinting technology and advanced cellular biology, the company is developing whole-cut, ground and hybrid products. Steakholder Foods has raised a total of $17.9M in funding over 6 rounds.	Pre-commercial stage
Redefine Meat (formerly known as Jet Eat) (Israel)	Plant based meat alternative	Ingredients including soy and pea proteins, chickpeas, beetroot, nutritional yeasts and coconut fat. The company has a partnership with meat importer Giraudi Meats to drive European distribution. They operate “large – scale meat printers” at HQ in Tel Aviv and a new factory in NL. Redefine meat is now offered in Loetje restaurant food chain in the Netherlands.	Commercialised

Company name	Food Category	More info	Commercialisation / Funding
Chef-It (Israel)	Printing burgers	An on -demand printing veggie burger machine.	No evidence of commercialisation
FabRX (UK)	3D printed medicine, inc nutrition.	Company focused on developing 3D printing technology for fabricating pharmaceuticals and medical devices. IP (WO2021160999A1). Company's project pipeline shows nutraceuticals in clinical trials phase.	Pre-commercialisation
Jan Smink (NL)	Restaurant using 3D food printer	Apart from the restaurant, Jan Smink also offers services including food styling, product development and demonstrations and workshops with a 3D food printer.	Commercialised
Dinara Kasko (Ukraine)	Chef	A pastry chef in Ukraine using 3D printing for her creations. Available products on Amazon however are mainly pastry moulds.	Unknown whether there are any 3D printed products sold in a pastry shop or 3D printing only used for developments
Print Cheese (NL)	Cheese printing	Dutch dairy farmer who also operates a 3D food printer, but no recent evidence of this being commercialised.	Status unclear
Chocola3d (Ukraine)	Chocolate	Offer chocolate printing services on their website, unclear if their own printer was ever commercialised.	Services seem commercialised

Company name	Food Category	More info	Commercialisation / Funding
Chocolate Prints (Switzerland)	Chocolate	Tiziana Schraner from Switzerland offers bespoke creations on her 3D chocolate printer and also offers “live” services at events.	Commercialised
La Enoteca (Spain)	Various	Restaurant which uses Natural Machine’s Foodini, 3D printer according to press content in 2016/2017 – no recent information.	n/a