

Meal Preferences, Habits and Perceptions towards Novel Foods and 3D-printed Foods among Night Shift Workers in Singapore

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URBAN ISSUE: NIGHT SHIFT WORKERS AND POOR EATING HABITS

- Generally, night shift workers face limited food options at work. They tend to eat unhealthy food and have erratic eating patterns (heavy meals before bedtime).
- Novel foods -> can be more nutritious than normal food; can diversify crops in food-producing countries.
- 3D-printed foods -> highly customisable; efficient and convenient production method.
- Problem: Food neophobia (reluctance to eat food that is made of unknown technologies or ingredients (e.g. lab-grown meat, insects)).

OBJECTIVE

This study aims to gain deeper knowledge of the motivations and barriers towards adopting novel foods and 3D-printed foods among nocturnal workers in Singapore and understand the factors that can lead to commercialising novel foods.

METHODOLOGY

This mixed-method qualitative perception study is delivered through a short questionnaire as the pre-interview process, which guided the face-to-face interviews thereafter.

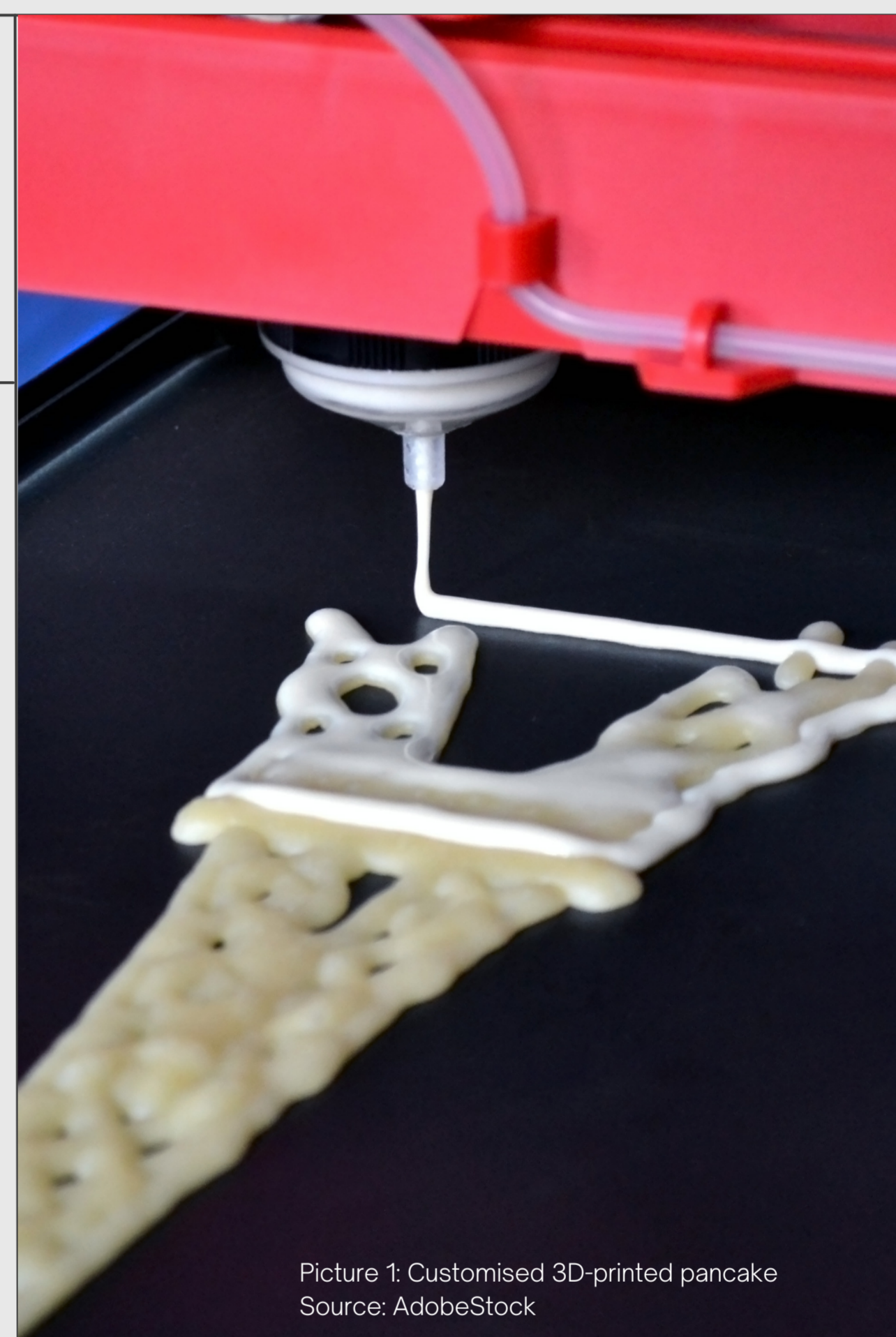
Snowball method was used to identify 20 participants from different industries from the author's network.

Adults aged 21 years old and above who work a full shift (≥ 8 hours) from the afternoon to late night, or beyond 12:00 a.m., and those who work extended hours from morning until past 11:00 p.m. are selected.

The baseline for night shift frequency is at least 5 nights worked in a month to be considered regular night shift workers.

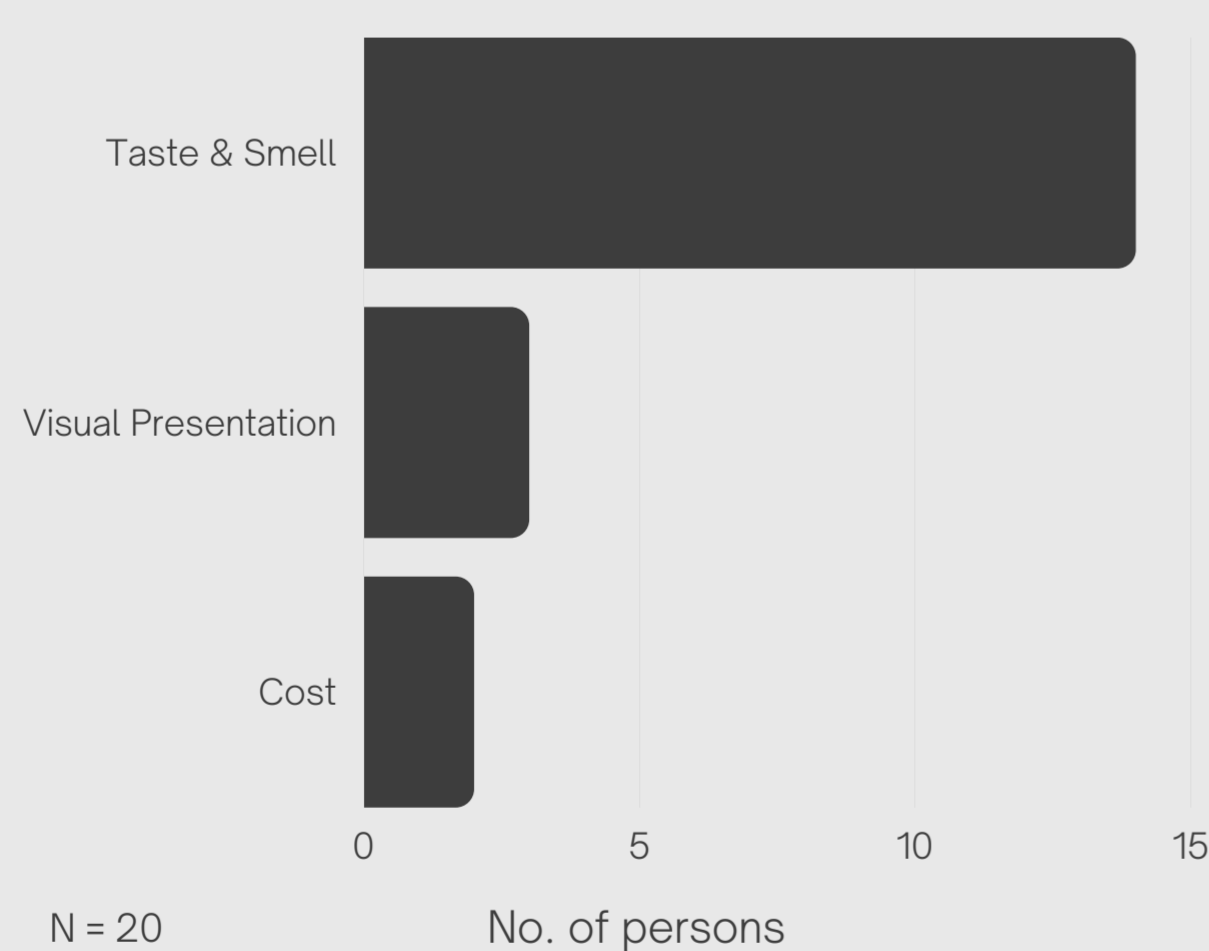
Among the sample, genders are evenly distributed at 10 females and 10 males. The respondents are aged between 24 years old to 56 years old, with a median age of 36 years old.

There are 5 media workers, 4 events and entertainment workers, 3 healthcare workers, 2 airport retail workers, 1 oil and gas worker, 1 seaport worker, 1 hospitality worker, 1 construction and engineering worker, 1 in the police force, and 1 in 24-hour private transportation.



Picture 1: Customised 3D-printed pancake
 Source: AdobeStock

Top 3 Factors to Try New Foods



FINDINGS

- Overall people are positively receptive to eco-friendly food products
- Night shift workers tend to eat light snacks during breaks; fast for hours until shift ends; eat heavy meals after work just before bedtime
- Top 3 factors to try new foods based on: **taste & smell, visual presentation and cost**
- Overall low awareness of what is novel food and 3D-printed food.
- Initial negative perceptions for both.
- After explanations: positive towards 3D-printed foods; less receptive of lab-grown meat; least receptive of insects as food.
- Most receptive of novel food from other countries (long history of eating); 3D-printed foods (plant-based or food waste products)
- Lab-grown meat: mixed reactions; willing to try; but not seen as long-term protein replacement
- Insect foods: most resistance; seen as a novelty, fun food but not for regular consumption
- Potential for convenience food products made of novel ingredients and 3D-printed technologies

CONCLUSION

A lack of understanding to harness 3D-printing food technology as a quick and convenient method to customise and tailor food items to suit different nutritional demands also contribute to the perception that printed food is “not food”. These attitudes correspond with earlier perception studies on 3D-printed food (Brunner et al., 2018; Lupton & Turner, 2016) which found that the neophobia towards this technology can be countered with better communication about the technological process, the ease of production, the health benefits of customising the nutrients and creative aspects of making 3D-printed foods (Brunner et al., 2018).

Among night shift workers, the customisable nutritional aspect of 3D-printed food and novel foods may be the most pertinent feature for introducing novel foods and technology. Nocturnal workers lack nutritious food options during their shifts, the respondents are highly aware of the malnutrition they face during night shifts. The respondents also revealed that they prefer light food items and easily consumed foods during their late-night breaks. There is potential for nutritious novel food products in the form of convenience foods that can benefit and appeal to these night shift workers.

Insect-based food face the greatest resistance among the respondents, with many outright rejections of eating insects, while those who have eaten insects before tend to view them as fun, novelty foods and not a serious food source. As food choices are informed by habits and preferences, insect food may not be a compatible or marketable alternative protein source to be offered locally, although more comprehensive quantitative research is needed to explore consumer perceptions in this aspect.



Picture 2: Fried Silkworms in insect form
 Source: AdobeStock

References:

Brunner, T. A., Delley, M., & Denkel, C. (2018). Consumers' attitudes and change of attitude toward 3D-printed food. *Food Quality and Preference*, 68, 389–396. <https://doi.org/10.1016/j.foodqual.2017.12.010>

Lupton, D., & Turner, B. (2016). 'Both fascinating and disturbing': Consumer responses to 3D food printing and implications for food activism. *Digital Food Activism*, Edited by Tanja Schneider, Karin Eli, Catherine Dolan and Stanley Uljaszek, by Routledge, London, Forthcoming.