University of BRISTOL

USING COMPUTATIONAL MODELLING TO RESET THE CONCEPT OF CUISINE AND TO RE-IMAGINE HEALTHY AND SUSTAINABLE MEALS: SNEAK-I

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TUKFS Conference 2026

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UKRI source cafés & bars NBU NUTRITION AND BEHAVIOUR UNIT

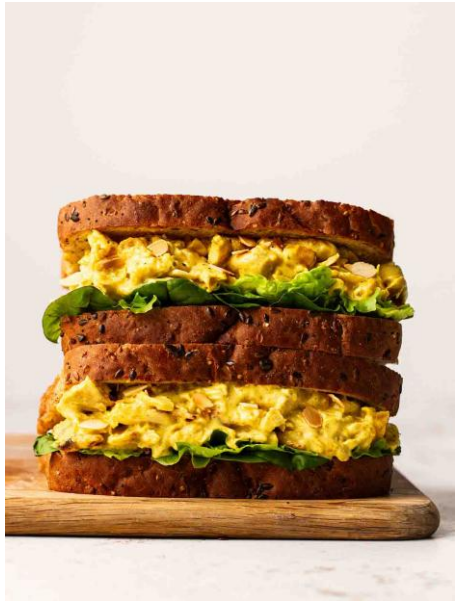
TRANSFORMING UK FOOD SYSTEMS Strategic Priorities Fund

How do you make pizza healthier and more sustainable?

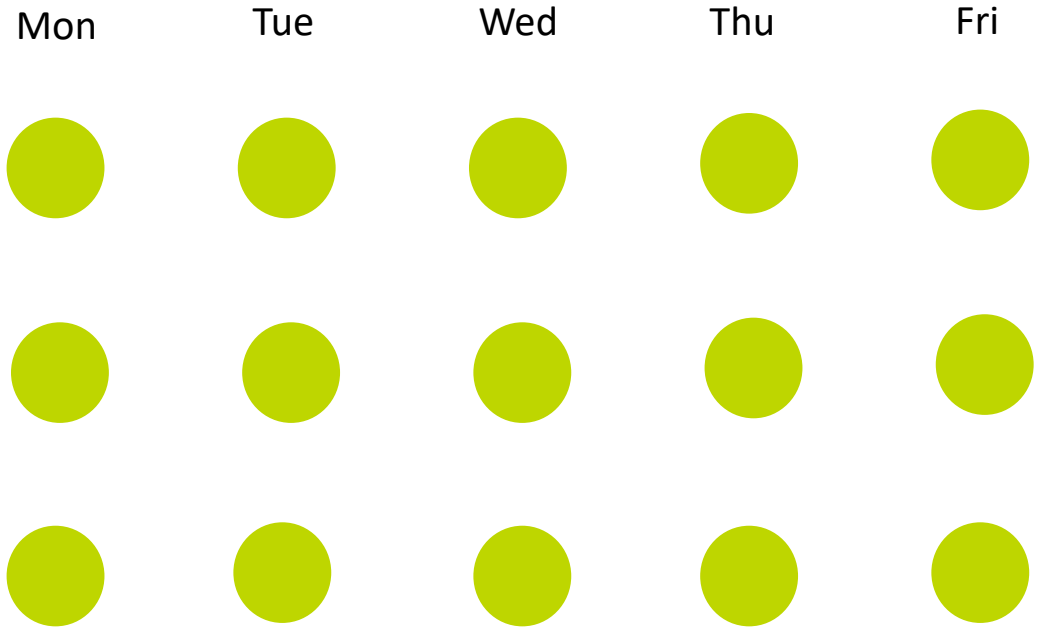
A missed opportunity…

- Sidestep challenges of reformulation and comparison with established favourites

- Historical precedent –coronation chicken!



SNEAK-i: Ingredient swaps



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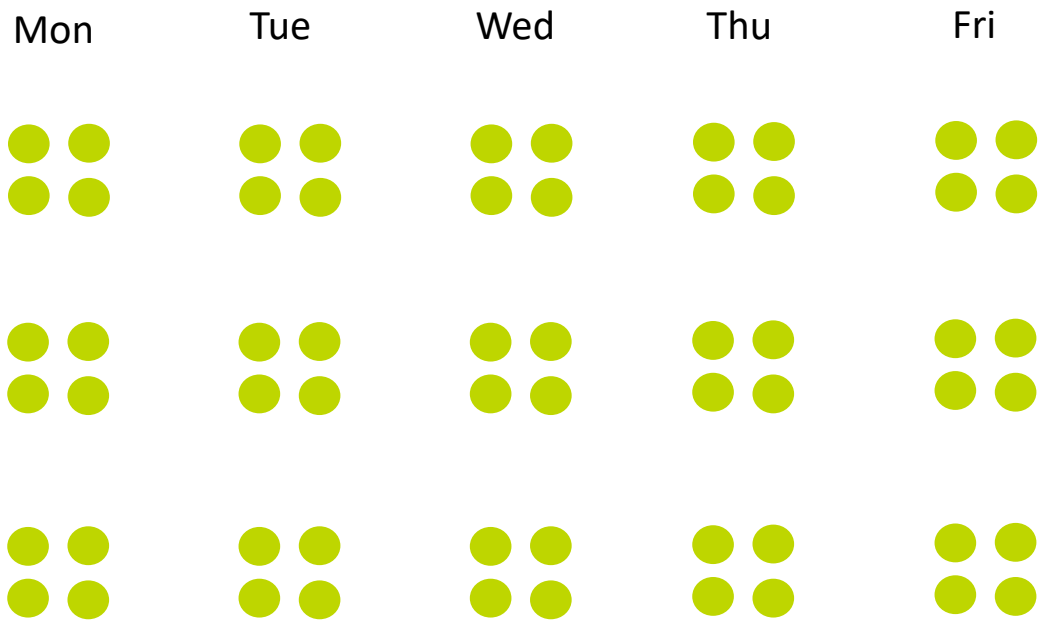

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- Now, if we put all main ingredients (68) into a single basket and “shuffle” the 15 recipes, there are ~10 million sets of unique ingredient combinations

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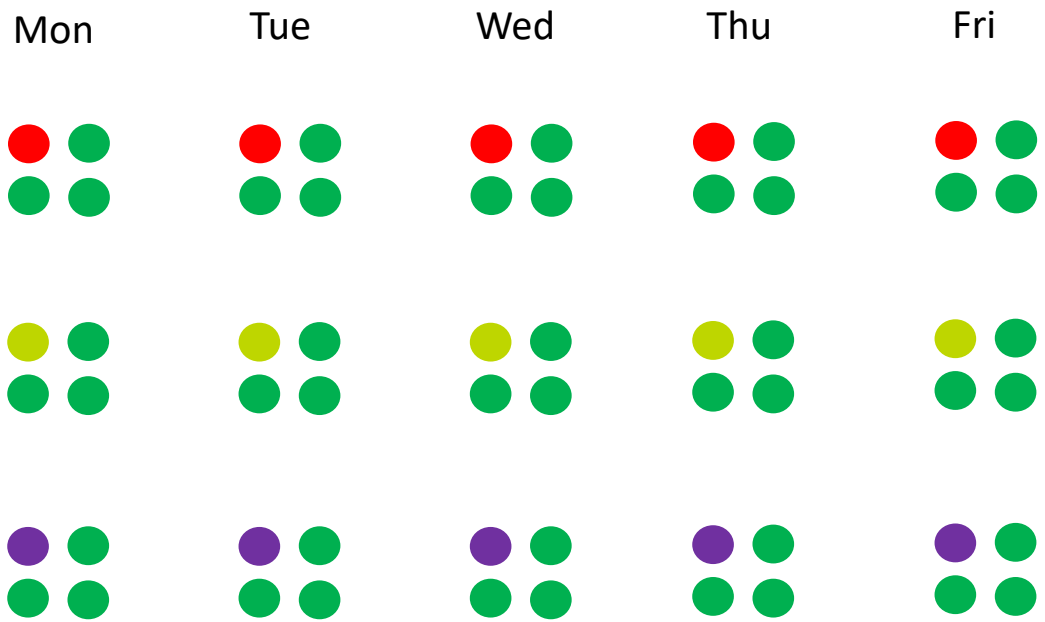

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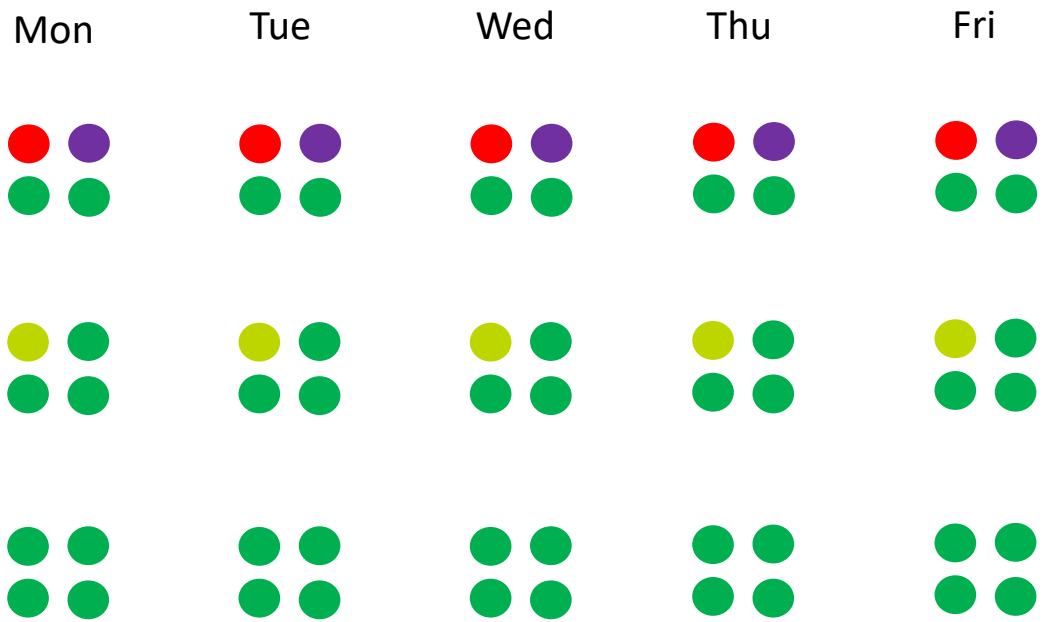

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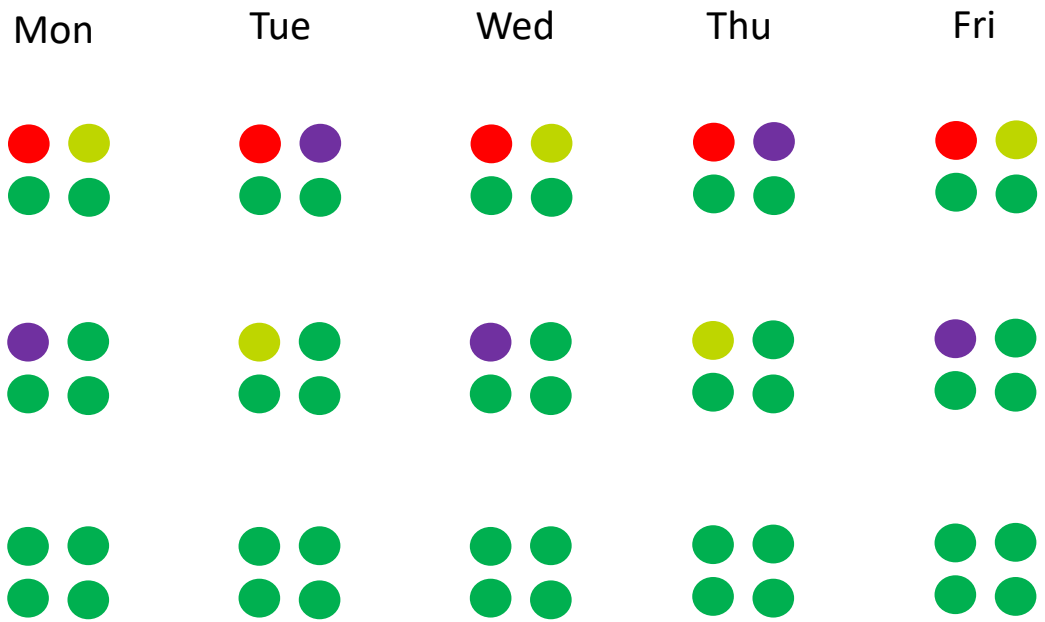

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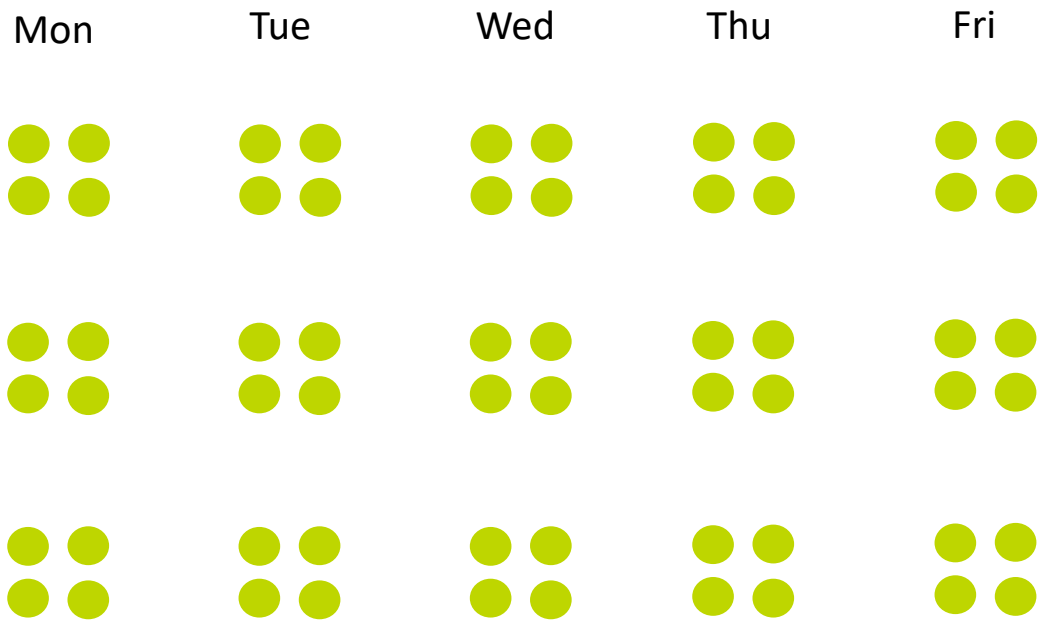

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- From these, we separated the combinations into meat, vegetarian and vegan baskets and optimised based on environmental and health indices

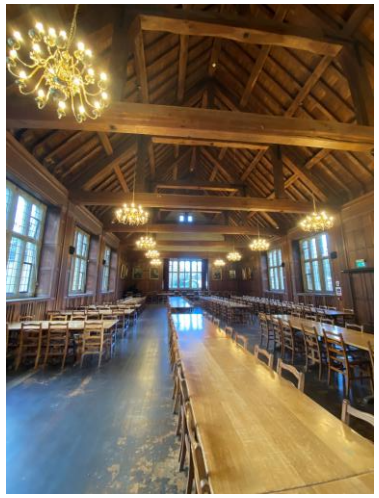
SNEAK-i cooking competition

- University development chef chose the best ingredient basket in each category
- Challenged professional chefs to create entirely novel dishes with these ingredients and held a cooking competition at the University of Bristol

Here is how we got on…

A second round of consumer testing

- Finished evaluating the winning dishes in a University Halls of Residence
  - Epiphany (vegan)
  - Revelation (vegetarian)
  - Eureka (meat)



Dish	Novelty M (SD)	Taste M (SD)	Visual Appearance M (SD)
Revelation	6.14 (2.9)	4.89 (2.8)	4.18 (2.8)
Cottage Pie	3.71 (2.3)	4.32 (2.1)	5.46 (2.4)
Mac N Cheese	4.00 (2.3)	5.66 (2.4)	5.29 (2.5)

	Consider choosing over any dish?	Consider choosing over a meat dish?
Yes, definitely	6	3
Yes, Depending on dish	11	12
Never	11	13
Total	28	28
% Yes	*60.7%*	*53.6%*

Are novel dishes a realistic solution?

A role for observational learning

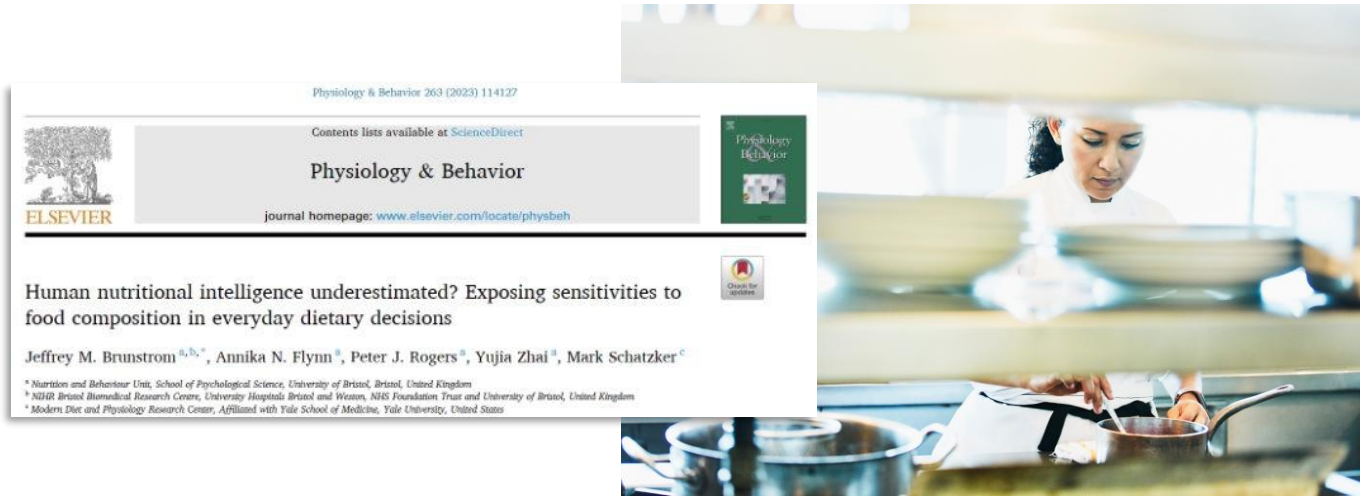
- Observational learning – capitalise on the experience of others to change one's own behaviour (Carcea & Froemke, 2018)
  - Demonstrated in human and non-human animals (Zajonc, 1965; Baeyens et al., 1996; Shutts et al., 2010; Carcea & Froemke, 2018)
  - Complex – for example, prestige bias (Henrich & Gil-White, 2001; Lee & Yamamoto, 2023; Brand et al., 2020)

- Social interaction and influence are important drivers of food preference and dietary behaviour Duncker 1938; Marinho, 1942; Birch, 1980;; Cruwys et al., 2015; Higgs & Ruddock, 2020;

- Observational learning and acceptance of new foods
  - Often demonstrated in children (Holley et al., 2017)
  - Can think of it as similar to flavour-flavour learning!

Social learning and a role for cuisine?

- Human tendency to share information enabled adaptive cultural information began to gradually accumulate over generations



- A functional role for cuisine?
  - Cultural transmission and inheritance of cuisine might be a key component of an extended biological process

Leveraging the power of social learning

- ‘Social influencers’ or celebrity endorsement of healthy and sustainable novel dishes

Next steps and further ideas

- Further testing in a hall of residence
  - Integrating novel dish into a weekly menu

- Engaging with stakeholders for further development
  - Food manufacturers
  - Catering providers
  - Application in schools?
- SNEAK-i principles applied to whole diets at a population level
  - How might cuisine have to change?

SNEAK-i Project Team

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Special thank you to all the Chefs who participated in our cooking competition!

University of BRISTOL

THANK YOU FOR YOUR ATTENTION!

Questions?

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