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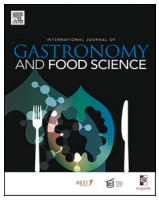

Meal mutability: Understanding how variations in meal concepts and recipe flexibility relate to food provisioning

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A B S T R A C T

This short communication introduces the meal mutability concept. This concept aims to describe how recipes and the ideal meals they refer to are flexibly interpreted and enacted as cooked dishes by consumers in practice. This flexibility may be linked to relations between provisioning and cooking in households, among other things. These features are explored using qualitative data originally analysed as part of a project focussing on quantitative modelling of household food and packaging waste. Meal mutability is intended to assist the development of modelling of the environmental consequences of particular foods and cooking methods.

The adoption of healthy and sustainable meals and food provisioning patterns by households could improve health, economic stability, and environmental outcomes (Kolbe, 2020; van Erp et al., 2021). In literature which addresses the environmental effect of recipes, there is a lack of attention to how recipes affect household meal planning and food provisioning (Chalmers et al., 2019; Kolbe, 2020; Speck et al., 2020; Frankowska et al., 2020; van Erp et al., 2021). While dietetics (Begley and Gallegos, 2010a; 2010b) and the food agency approach (Wolfson et al., 2017; Trubek et al., 2017) have attended closely to the broad range of factors linked to cooking, this short communication examines potential relationships between meal concepts and modes of provisioning. In other literatures engaging with meal planning, recipes are only engaged with in passing as flexible aspects of domestic food practice (Dean et al., 2010. p.589; Yates and Warde, 2017; Jackson, 2018) and this is arguably inadequate for understanding the complexities of how recipes transform food (Cuykx et al., 2023).

Reynolds (2017a, 2017b; 2017c) has highlighted how a specific recipe can vary substantially in terms of ingredients, methods, and cooking techniques yet still be recognizable. Frankowska et al. (2020) further highlight that this kind of variability between cooking practices has implications for quantitative modelling of environmental impacts, and dietary assessments also need to account for this variability in some way (Chiang and Sheu, 2020; Speck et al., 2020). We suggest that there may be variabilities in how recipes are enacted between individuals, households, and communities which are systemic, with potential system wide implications. Changes to provisioning modes such as shopping, shelf life, and packaging will inevitably interact with this variability. A method of accounting for this variability needs to be developed to assist the development of gastronomic research, food and nutrition policy, and sustainable new product development. For this reason, we build on the work of Borghini (2015) on open-ended recipes to propose the concept of *meal mutability*.

A recipe is constituted by a list of ingredients and a process at minimum. Borghini (2015, 2022) engages with recipes in philosophical terms, and proposes a performative framework for understanding them. In this framework the food-stuff created when a recipe is followed, is referred to as a dish. While each recipe may be understood as the set of instructions to prepare an idealised meal, understanding each cooked dish as a separate instance enables Borghini (2015) to argue that recipes are open-ended. Each recipe is "an infinite game, whose rules i.e. expertise, performative utterance, collective judgement are known, but whose beginning and end may remain unknown" (Borghini, 2015. p.736). Using this idea, it is possible to describe how the flexibility of recipe/meal concepts might play a role in the practical organisation of household cooking and food practices. This short communication explores the possibility that the degree of flexibility with which recipes as ideas are interpreted and performed in the household may impact how meals are planned and how provisioning is done and vice versa, with reference to empirical material. We are not looking directly at factors that enable or influence cooking, meal choice or provisioning (see Fig. 1).

The ideas discussed here emerged from qualitative research supporting a food and simulation project. Remote semi-structured interviews were conducted with 28 participants and 25 of those participants also took part in diary research over the course of a week (Isaacs et al., 2021). These interviews and diary research aimed to

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understand how elements of weekly and daily routines in a household may affect patterns of food provisioning, cooking and wasting practices. Participants were recruited by means of an initial screening questionnaire, and informed consent was gained for all stages. Ethical approval was granted by University of Sheffield Management school Ethics board (Ref #043489). Pseudonyms are used throughout, for the participants. Thematic analysis of the interview transcripts and diary entries was done using the Nvivo software package according to the needs and theoretical assumptions of the project. Further explanation of the methodology and other findings from this research can be found in Pickering (2023). As the focus of the simulation project was not fully aligned with the topics explored here, we are not able to give a more comprehensive overview; this short communication is intended as an initial proposition.

The importance of meal mutability is particularly evident when the relationship between provisioning and cooking is constrained. In one instance, a participant named Siobhan discussed how her meal planning fitted around her weekly vegetable box delivery. Vegetable boxes and other forms of food delivery service are a niche form of provisioning (Armstrong et al., 2022; FSA, 2022; Wheeler, 2020) but they are of interest here because they present the consumer with a pre-arranged selection of items rather than the wider selections presented by supermarkets. The consumer is often only able to indicate strong preferences against certain items. These features make them useful because they allow for a comparison with more flexible modes of provisioning. When some aspects of choice are constrained, consumers like Siobhan are forced to orient their selection and planning of recipes for the week ahead around what is presented. Siobhan described in detail how this worked for her household.

> "We get a veg box, so we get that on a Thursday, and we try and, that probably forces us to plan out some meals, so the one we get we don't know what's gonna be in it till it arrives. So usually at some point on Friday or Saturday we'll have to sit down and have a think. […] to then work out what we need from the shop cause we often then if we were doing the shopping before the veg box came, we used to buy stuff that didn't really work with what's in the veg box".
>
> [Siobhan]

Here Siobhan demonstrates that pre-arranged provisioning determines to some degree how meals are planned and recipes selected. The vegetable box delivery did not only determine when planning took place but also how it took place, as they needed to purchase the correct items in the additional weekly shop, based on what had already been delivered in the vegetable box. This shows how meal mutability works, as Siobhan's recipe selection and formation had to accommodate the fixed but undeclared set of ingredients provided by the vegetable box delivery. Other participants like Daria also had vegetable boxes delivered and displayed significant flexibility in the meals they were prepared to make with what was brought. This was remarkable as Daria had a baby to care for, but still felt able to make appropriate meals in this flexible way. In one case, she described making pancakes out of chopped up cooked pumpkin that was otherwise surplus to requirements. This was a recipe which would involve considerable skills and creativity. It also did not seem to conform to standard cultural templates for a meal. Daria explained elsewhere in the interview that she regularly cooked a set of fixed meals, but she also 'keep [s] things new'. It was clear that Daria had considerable food agency (Trubek et al., 2017), but the type of provisioning still seemed to demand a high degree of flexibility.

Daria notes that her cooking skills improved, and this raises the issue of whether such flexibility is a way of dealing appropriately with the restricted selections provided by vegetable boxes, or if it is cultivated by vegetable boxes as a form of provisioning. Vegetable boxes are likely to require a high level of food agency as a mode of provisioning, but they do highlight a connection between constrained forms of provisioning and high meal mutability. High levels of meal mutability were evident in a range of cases in which participants did not receive vegetable boxes. Freya, another participant in the study, did not receive a vegetable box but her account of cooking practices demonstrates the kinds of flexible connections between ingredients that the meal mutability concept aims to explore.

> *"You know, we have quite a lot of stuff in stock […] so without having to go to a shop, you can kind of concoct something in various different ways […] I think we both cook a bit like that, kind of, 'What do I fancy? What have we got that needs using? […] What can I combine that fits how I feel like eating?' umm, so there aren't many things, there are a few things, but*

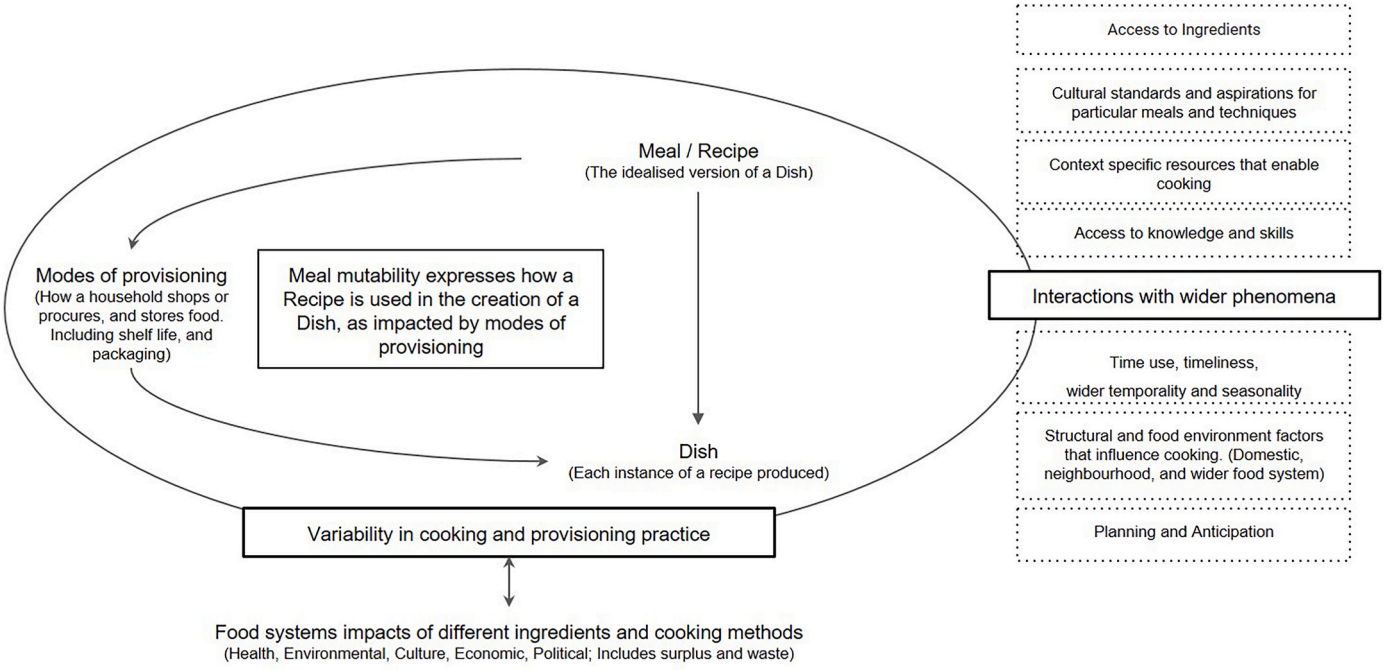

Fig. 1. The relationships between elements of the meal mutability concept and wider phenomena.

there aren't many things where we're like, 'I am making this one specific thing today'" [Freya]

Freya demonstrates a flexibility in terms of the concepts she uses to generate ideas for meals, despite potentially flexible provisioning modes. This was evident among a number of other participants as well. Rather than meals being based on particular fixed recipes for a range of appropriate meals they are based on common categories of recipes/dishes that will accept a range of available ingredients. Shortly after the excerpt above, Freya went on to describe how lacking certain ingredients would not result in an automatic trip to the shops. In this situation, the necessary flexibility is being preserved in the formation of recipes, to avoid additional flexibility in how provisioning is done. Given that cooking and provisioning are linked but require slightly different forms of activity and efforts, it is possible to see why this kind of flexibility may become important in particular contexts. DeVault (1991) uses the metaphor of a puzzle to capture how meal planning works in households, and this is echoed by the game metaphor used by Borghini (2015). The different aspirational goals, individual tastes and the practical needs of a household all form part of the puzzle posed to those responsible for provisioning and preparing food in a household. Extending this puzzle metaphor, in some cases the recipe must also change in response to the need to solve the puzzle in particular ways, dictated by the situational demands of each household.

In the examples given so far, recipes and cooking have been fairly flexible and their demands have been subordinate to the available food. Other participants approached meals with a very different starting point, by shopping for particular ingredients and planning out particular meals at the provisioning stage through the connections between these ingredients found in recipes. Sara for example, who was living with a new housemate, described how she would put potential meals together as she walked around the supermarket shopping rather than doing this work in the home.

"when I go to the supermarket, only up until recently […] I was always cooking for myself, and kind of you buy a pack of salmon, there's two pieces of salmon in there and you know if you cook it all together it will last two meals, a pack of chicken thighs might make a curry or something like that so that will do two or three meals … Yeah, like most things, like if you've got tinned tomatoes, peppers, onions, you can make a whole range of things when you've got like mince or chicken and stuff'.

[Sara]

Along with the contrasting evidence from other participants, this account suggests that more planning at the provisioning or shopping stage, outside the home, make the specific connections between ingredients that constitute recipes important. Sara mentioned separately that she used a dieting app on her phone to generate recipes based on what she had in the home. This dieting app provided relatively strict guidelines for what was to be included in recipes. Combined with her reflection on the amount of meals particular ingredients will provide in combination with other staples, this provides a potential insight into how less flexible recipe concepts among consumers may affect provisioning practices. In her account, anticipatory work (Pickering, 2023) to form meals takes place at the provisioning or shopping stage, rather than at home. As Sara also notes, particular ingredients feature in a wide range of recipes and are bought regularly, echoing how Freya keeps particular staple ingredients in stock. This suggests that even when meal mutability is low, particular stable and common base elements of recipes may also be able to provide the basis for flexibility at the provisioning stage. Further data from a broader range of consumers is needed to fully demonstrate the potential connections between more fixed, less mutable meals and recipes, and less constrained forms of provisioning.

Meal mutability in households may vary in predictable ways that may be linked to other practices and features of the household. This short-communication is not able to demonstrate these patterns definitively, but it hopes to provide a starting point for considering them in more detail. There is potential for future work building evidence and conceptualisations of meal mutability, connecting the concept to existing work on recipes, cooking and provisioning such as Cuykx et al. (2023) and the food agency approach (Wolfson et al., 2017; Trubek et al., 2017). Such work would ultimately lead towards a developed meal mutability concept which can assist quantitative modelling of the potential and real environmental impacts of recipes and meals, and the implementation of more effective recipe and cookery based interventions to improve personal, societal, and planetary health. This contributes towards the goal of a circular gastronomy, towards the re-creation and re-design of meals and recipes for a sustainable future (Nyberg et al., 2022).

Implications for gastronomy

Meal mutability is proposed as a concept to describe the way in which recipes may be flexibly interpreted and enacted as meals by consumers, based on different relationships between provisioning and cooking in domestic households. The goal of this work is to assist the development of work attempting to estimate the environmental consequences of foods and particular meals, in order to promote healthier and more sustainable alternatives. A concept which is able to account for and provide potential future guidance on the connections between domestic recipe interpretation, meal production and provisioning practices will improve the creation of more sustainable and healthier alternatives based on quantitative modelling and assessment of nutritional and environmental indicators of ingredients. and cooked meals. This is because such a concept will provide a way to account for and describe particular variabilities that may have particular associations with other aspects of household food practice. This contributes towards the goal of a circular gastronomy, in that it pursues the re-creation and re-design of meals and recipes for a sustainable future (Nyberg et al., 2022).

Author credit statement

Jack Pickering: Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Visualization; Writing - original draft; Writing - review & editing.

Christian Reynolds: Funding acquisition; Conceptualization; Project administration; Resources; Supervision; Writing - review & editing.

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Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Outside this Work – CR has advisory positions on boards at the Nutrition Society, and the Institute of Food Science & Technology. CR has had payment via City, University of London for consulting for WRAP, DEFRA, and the FSA. CR has consulted and discussed my research in expert interviews or as part of an expert advisory group (for no fee/Pro Bono) with the following organizations:

- Collider Lab, YUM Brands - 2020
- Fwd - 2020
- Greener Beans – 2020
- QUT Digital Media Research Centre – 2020
- Haier Israel Innovation Center, Ltd. – 2021
- Almond Board of California, via Porter Novelli - 2022

CR has been paid a Speaker's Stipend by the following events:

- The Folger Institute – 2020

CR has chaired panels and have presented at the following organisations (for no fee/Pro Bono):

- Nutrilicious -2022/23
- MyNutriWeb -2022/23

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Data availability

Data will be made available on request.

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