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# Co-designing institutional catering interventions for food system change: developing a menu reformulation approach in a UK children's hospital

Kelly Parsons, Research Associate  
IMS Epidemiology  
University of Cambridge





## Background

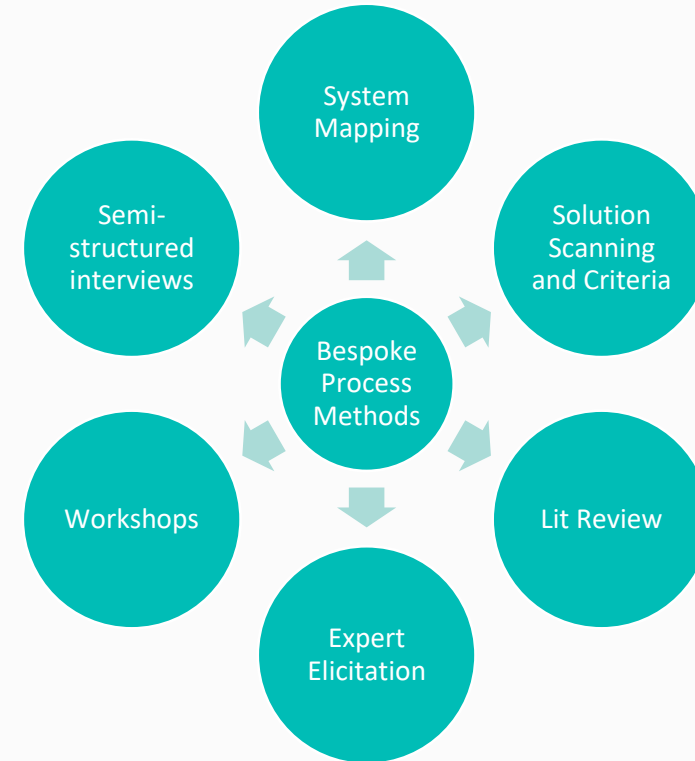
- Attempts to identify and deliver actions which catalyse food system change widespread in public sector institutions serving food, like schools, hospitals.
- Many different institutions, solutions in scope.
- Study describes and appraises process of ‘bottom-up’ solution identification and co-design in the novel setting of a city children’s hospital.
- Menu reformulation intervention presently being evaluated (effectiveness; process) over an 18-month period.





# Method

- Bespoke process developed to
  - Elicit and combine scientific evidence with expert and stakeholder knowledge and experience
  - Co-design (menu reformulation) intervention





## Conceptual framework

Co-creation/design/production addressed by multiple disciplines/sectors: User-centred design; Public/Health; Implementation science

Distinct literatures around co-created:

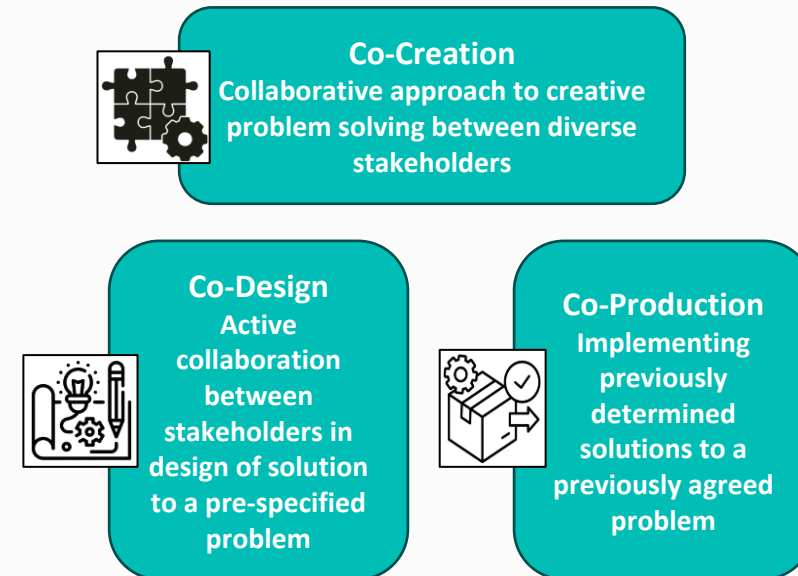
- Research
- Interventions

Terms often used without rigour/application in practice

Lack of consistency in application and reporting

No agreed framework of 'stages' where co-creation can happen

Vargas et al (2025): up to 7 stages (average 4-5)

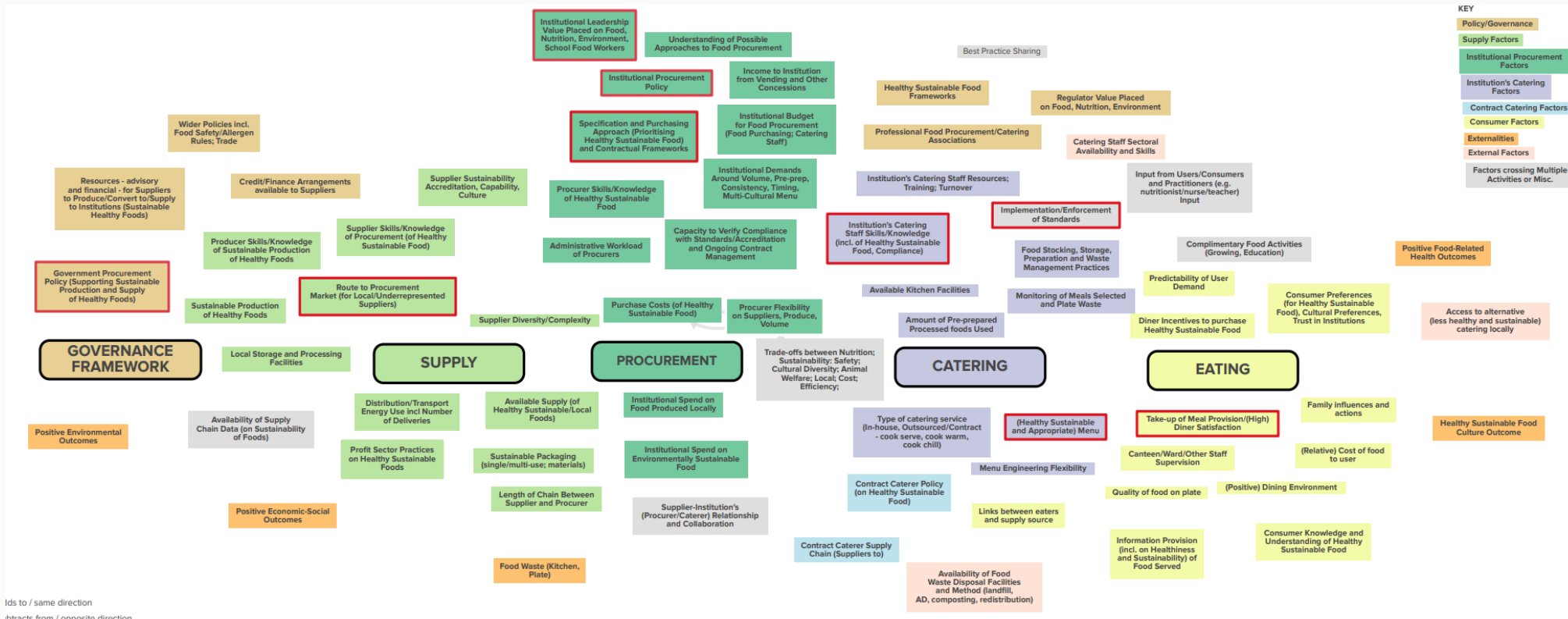




# Findings



# Mapping context: Institutional catering (sub-)system



# Opportunity identification



Birmingham City Council



Primary Schools



Universities



FE College



Hospital

# Solution scanning, criteria application, shortlisting



## Long-list

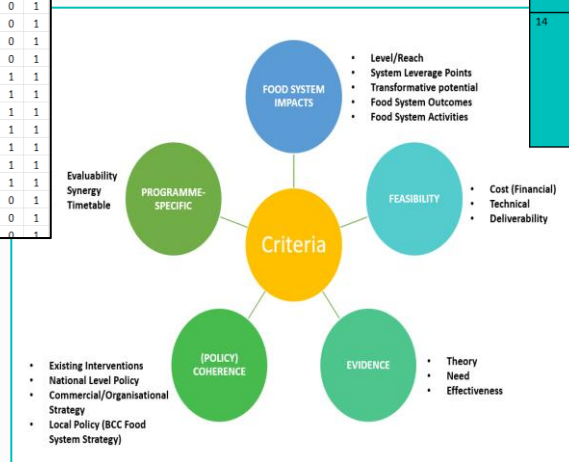
Instrument Type	Intervention	ro	of	litu	fo	ali	go
Certification and standards	Mandate food standards requiring public facilities and contractors to serve food and beverage	0	0	1	0	0	1
Governance/organisation	Involve professionals with technical nutrition and sustainability expertise in planning decisions	1	1	1	1	0	1
Economic/financial	Expand and support new food enterprises by funding incubator programs	1	1	1	1	1	1
Certification and standards	Establish guidelines for school feeding programs which ensure staff are adequately trained in	0	0	1	0	0	1
Certification and standards	Establish guidelines for school feeding programs which ensure menu is designed to prioritise c	0	0	1	0	0	1
Certification and standards	Establish guidelines for school feeding programs which ensure meat is served less than 1-2 tir	0	0	1	0	0	1
Certification and standards	Establish guidelines for school feeding programs which ensure use of environmental modes o	0	0	1	0	0	1
Certification and standards	Establish guidelines for school feeding programs which ensure purchase of school kitchen app	0	0	1	0	0	1
Certification and standards	Establish guidelines for school feeding programs which ensure fresh drinking water (refillable	0	0	1	0	0	1
Certification and standards	Establish guidelines for school feeding programs which ensure nutrition and sustainability edu	0	0	1	0	0	1
Certification and standards	Establish guidelines for school feeding programs which ensure awareness campaigns for the b	0	0	1	0	0	1
Certification and standards	Support schools and early learning centres to work towards and achieve state/local governm	0	0	1	0	0	1
Information/communication	Fund academic institutions' student unions to facilitate student-led projects to promote flexit	0	0	1	0	0	1
Framework policies	Support national campaigns such as 'Flexitarian City', 'Sustainable Fish Cities' and 'Fairtrade to	1	1	1	1	1	1
Information/communication	Incentivise food sustainability practices in the food service setting (restaurants, catering, retail	1	1	1	1	0	1
Information/communication	Invest in awareness-raising activities to reduce meat consumption and promote local, Fairtra	1	1	1	0	1	1
Information/communication	Establish non-commercial foundation with chefs and technical nutrition and sustainability exp	0	1	1	0	0	1
Direct food provision	Promote desired diet-related practices through City-funded events (e.g. only serving vegetari	0	1	1	0	0	1
Direct food provision	Connect emergency food relief services (including school breakfast programs) with local food	0	0	1	1	1	1
Technology/innovation	Innovate digital solutions to support people experiencing food insecurity to find community fi	1	1	1	1	1	1
Technology/innovation	Create rooftop, vertical and urban gardens designed, built and managed for high-yielding foo	1	1	1	1	1	1
Information/communication	Promote the vital role of primary producers to the general public (e.g. farmer visits at local sc	1	1	1	0	1	1
Regulatory	Promote best-practice in food production approaches by offering financial support where rec	0	0	1	0	1	1
Regulatory	Promote best-practice in food production approaches by offering financial support where rec	1	0	1	0	1	1
Framework policies	Develop internships, apprenticeships and scholarships to inspire students and young people to	1	0	1	0	1	1
Framework policies	Implement food procurement policies for food service in public facilities by requiring a propo	0	0	1	0	0	1
Framework policies	Implement food procurement policies for food service in public facilities by establishing a ten	0	0	1	0	0	1
Information/communication	Implement food procurement policies for food service in public facilities by promoting equit	0	0	1	0	0	1

N = 286

## Medium-List

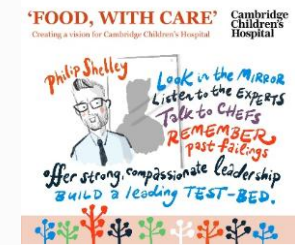
#	Intervention	Existing Examples/Initiatives	R1 Criteria Applied
12	Improve implementation/enforcement of existing standards (could include making voluntary standards mandatory, monitoring of implementation, simplify fundings streams to schools)	Food Standards Agency - School Food Standards Compliance Monitoring Pilot	<b>Level:</b> Good-low agency <b>SLP:</b> Implementation/Enforcement of Standards <b>Trans:</b> Low, in that existing standards need to be more ambitious, but could lead to better food policy implementation approach more broadly <b>Ev-Theory:</b> Not Known <b>Ev-Need:</b> Yes – evidence of poor implementation and enforcement <b>Poco- Exist Bham:</b> Not Known <b>Poco-Nat:</b> Good – FSA pilot
13	Engage nutrition/sustainability professionals, or lived experience, to co-produce specification and menu design*	Nutrition focus Participatory design of Good Food Purchasing Plan, USA	<b>Level:</b> Medium <b>SLP:</b> Specification and Purchasing Approach; Institution's Staff Skills/Knowledge <b>Trans:</b> Only as part of a wider approach <b>Ev-Theory:</b> Some evidence of existing initiatives <b>Ev-Need:</b> Yes – evidence of poor implementation and enforcement <b>Poco- Exist Bham:</b> Not Known <b>Poco-Nat:</b> Not Known
14		Sustainability focus Food Waste Consultants Participatory design of Good Food Purchasing Plan, USA	<b>Level:</b> Medium <b>SLP:</b> Specification and Purchasing Approach; Institution's Staff Skills/Knowledge <b>Trans:</b> Only as part of a wider approach <b>Ev-Theory:</b> Some evidence of existing initiatives <b>Ev-Need:</b> Yes – evidence of poor implementation and enforcement <b>Poco- Exist Bham:</b> Not Known <b>Poco-Nat:</b> Not Known

N = 35





# Consultation with solution organisations





## Solution ideation

- Workshop with representatives from Birmingham institutional catering institutions to present potential actions, assess interest, acceptability, feasibility
- Focus on potential solutions from solution scan, organised by system leverage point/problem which needs action

Leverage Point/Problem	Potential Solutions
Institutional procurement <b>specifications/contracts do not prioritise food, health, sustainability, social value</b> , (and prioritise cost over quality) (linked to problem of lack of institutional leadership recognition of the value of good food)	<ul style="list-style-type: none"> <li>• Strengthen <u>national-level</u> policy</li> <li>• Strengthen policy at local <u>level</u></li> <li>• Strengthen institutional-level policy (bespoke or existing framework)</li> <li>• Leverage/extend regulatory <u>requirements</u></li> <li>• Training – Procurement Staff</li> <li>• Training – Institutional Leaders (Senior staff <u>incl</u> headteachers, governors, chief executives)</li> </ul>

Leverage Point/Problem	Potential Solutions
Government rules on healthy sustainable public sector food procurement (mandatory and voluntary) are <b>weak, and /or not implemented or enforced</b>	<ul style="list-style-type: none"> <li>• Strengthen <u>national-level</u> policy</li> <li>• Strengthen policy at local <u>level</u></li> <li>• Strengthen institutional-level policy (bespoke or existing framework)</li> <li>• Leverage/extend regulatory requirements (safety, regulatory bodies)</li> <li>• Improve Measuring/Monitoring/Targets (could <u>include</u>: reporting of meal uptake, supplies, food waste. Could operate nationally, locally, institutionally)</li> </ul>

# Solution ideation with research team



Round 1 criteria		Round 2 criteria	
	Rating		Rating
Level	Med – depending on approach may require indiv choice	Reach	Depends on number/type of institutions involved, could be expanded
System leverage points	Procurement specification; uptake; diner preferences; education	System leverage points	Potentially powerful if changes supply and demand
Transformative potential	Med	Transformative potential	Med
Theory (CLD)	Fairly narrow bit of system	Financial cost	Low (but some commercial risk)
Evidence of need	Good – meat reduction = priority	Technical barriers	Requires expert input from existing examples
Alignment with B'ham interventions	Some Meat-free Mondays initiatives in place	Deliverability	Interest from several institutions
National level policy	Meat reduction = politically controversial	Evidence of effectiveness	Good evidence from university sector
		Commerical/organisational strategy	Good – interest in addressing sustainability from multiple stakeholders

Low

Medium

High



## Solution confirmation with delivery partners



Workshop at BCH covering:

- What evaluation by Mandala team brings to the institution
- Expectations of delivery partners (cooperation with intervention and evaluation co-design; provision of date; agreement on how results will be used)
- Shortlisted interventions for consideration

IC1 Healthy/Sustainable Delivery Framework	Implementation of existing framework for healthy, sustainable procurement.
IC2 Plant-Based Menus	Delivering plant-based menus in hospital context.
IC3 Bespoke Procurement Specification	Specifying and delivering bespoke framework for healthy, sustainable procurement.

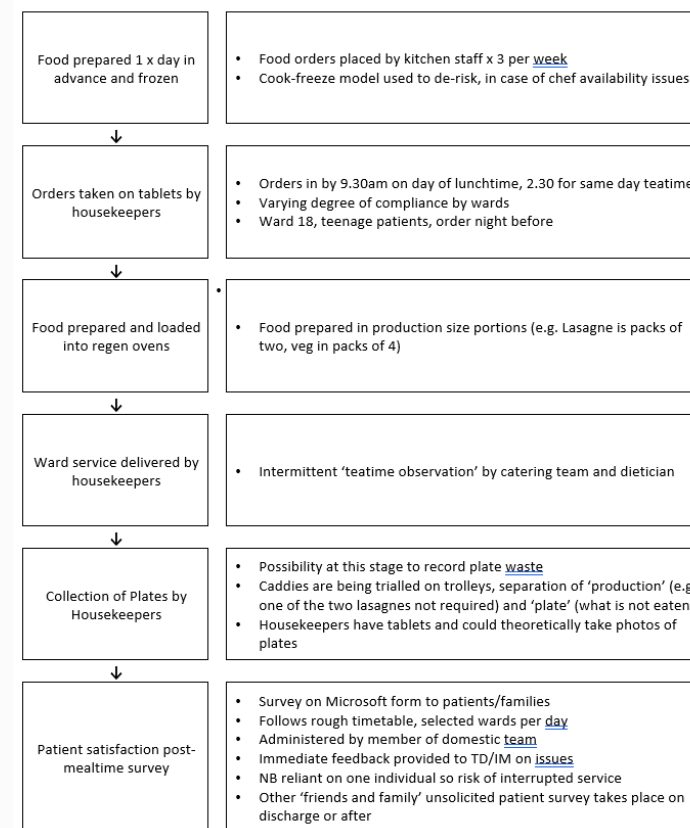


# Specification of intervention context

## Menu re-design process

Phase	Additional Details
Extract menu uptake data by week since previous menu change to determine popularity	Data from Catering management software Menu choices focused on main courses (protein element)
Remove unpopular*; identify new <u>dishes</u> * <u>unless</u> competing with most popular e.g. fish Friday, Sunday roast, chicken goujons	Includes addition of some seasonal dishes BCH/Catering Dietician Catering Manager BCH General Manager
Discuss draft menu with head chef and kitchen supervisor	Focus on operational feasibility ( <u>incl</u> prep time required e.g. no two pastry dishes in one day; response to regen oven e.g. quiche drying out) Head Chef Kitchen Supervisor
Nutritional and cost analysis of dishes	Use min/max approach to meal combinations (main, sides) – take the <u>median</u> <u>Main focus</u> iron and zinc Analysis by Dietician
Draft menu to head of Dietetics	
Tasting with Patient Experience incl. Young Persons Advisory Group + housekeeping	Already nutrition and cost compliant, looking for nuances re. taste e.g. spice levels
Send final nutritional analysis to head of Dietetics for sign off	
Send menu to print; run-down old stock	
Develop Comms plan	Menu on intranet and send via email (Trust Communication Email) Comms on trolleys to let housekeepers know about <u>changes</u> Update housekeeper tablets
Menu goes live	
Ongoing monitoring of patient satisfaction	

## Patient meal provision process





## Prototype ideation: best practice workshop

- BCH delivery partners: Head of Catering; Operations; Dietician; Chefs
- Representatives: Chefs in Schools; ProVeg; Matthew Knight, Hillstone Primary
- Further deep dive into intervention context – hospital catering, e.g.:
  - Top priorities: Ensuring menu changes do not negatively impact patient satisfaction; getting children to eat anything
  - As a specialist paediatric hospital (takes patients from other hospitals), BCH has higher number of more unwell children, a high rate of autism, children are very selective about food (linked to medical conditions). And lots of ‘frequent flyer’ patients.
  - Familiar Favourites is useful for fussy eaters but overused - increasingly the focus of selection rather than standard menu.
- Non-hospital caterers shared best practice on incorporating, preparing and serving delicious healthy and sustainable plant-based dishes on menus in children’s settings. Sample dishes to provide inspiration.
- Discussion of similarities and difference in institutional context. E.g. hospital setting more difficult to challenge children’s eating habits.
- Mandala presentation on most environmentally-sustainable ingredients





# Prototype ideation

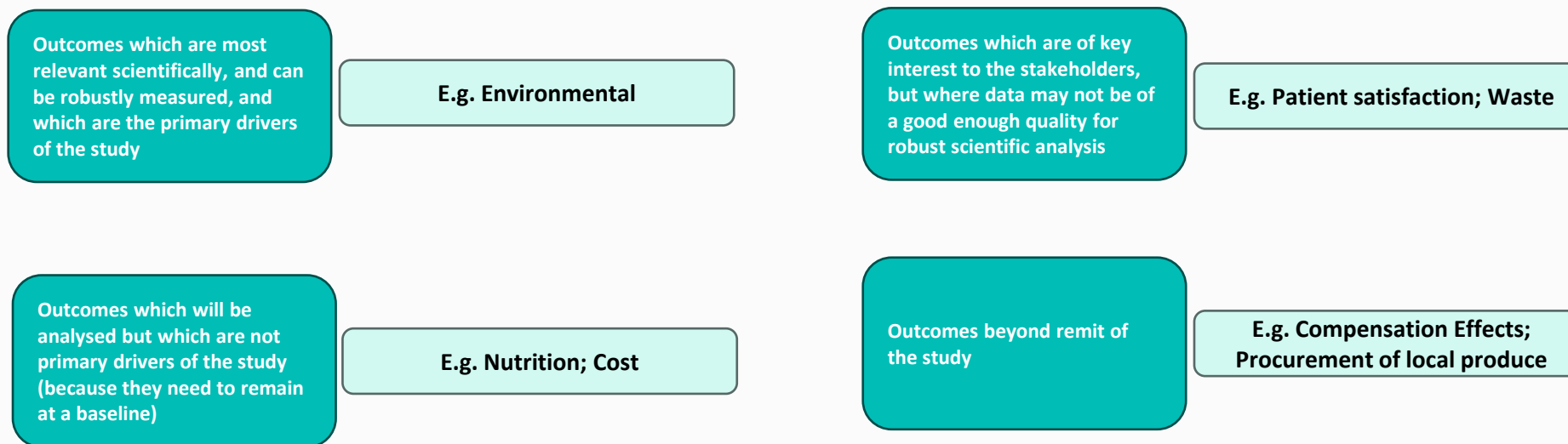
- Intervention does not apply to patients on special diets, and those too young or too unwell to eat for clinical reasons.
- Also excludes hospital's retail and hospitality food offers
- Stealthy reformulation approach
- Begin with 'low hanging fruit' (e.g beef dishes)



Menu Change Date	Details
July 2024	<p>Beef Bolognese: beef mince reduced from 50g to 30g + 15g Quorn mince</p> <p>Beef Lasagne: Reduced cheddar from 15g to 10g cheddar, and beef mince reduced from 50g to 30g + 15g Quorn mince</p> <p>Mac n Cheese: Replaced 15g grated mozzarella with 15g cauliflower</p> <p>Chicken Tikka: Was 50g chicken, reduced to 40g chicken and 5g red lentils</p> <p>Veg Lasagne: Was 12.5g cheddar, reduced to 7.5g per portion. Added 10g brown lentils (dried weight)</p>



## Co-designing the evaluation: 'aim, scope and set up data collection'

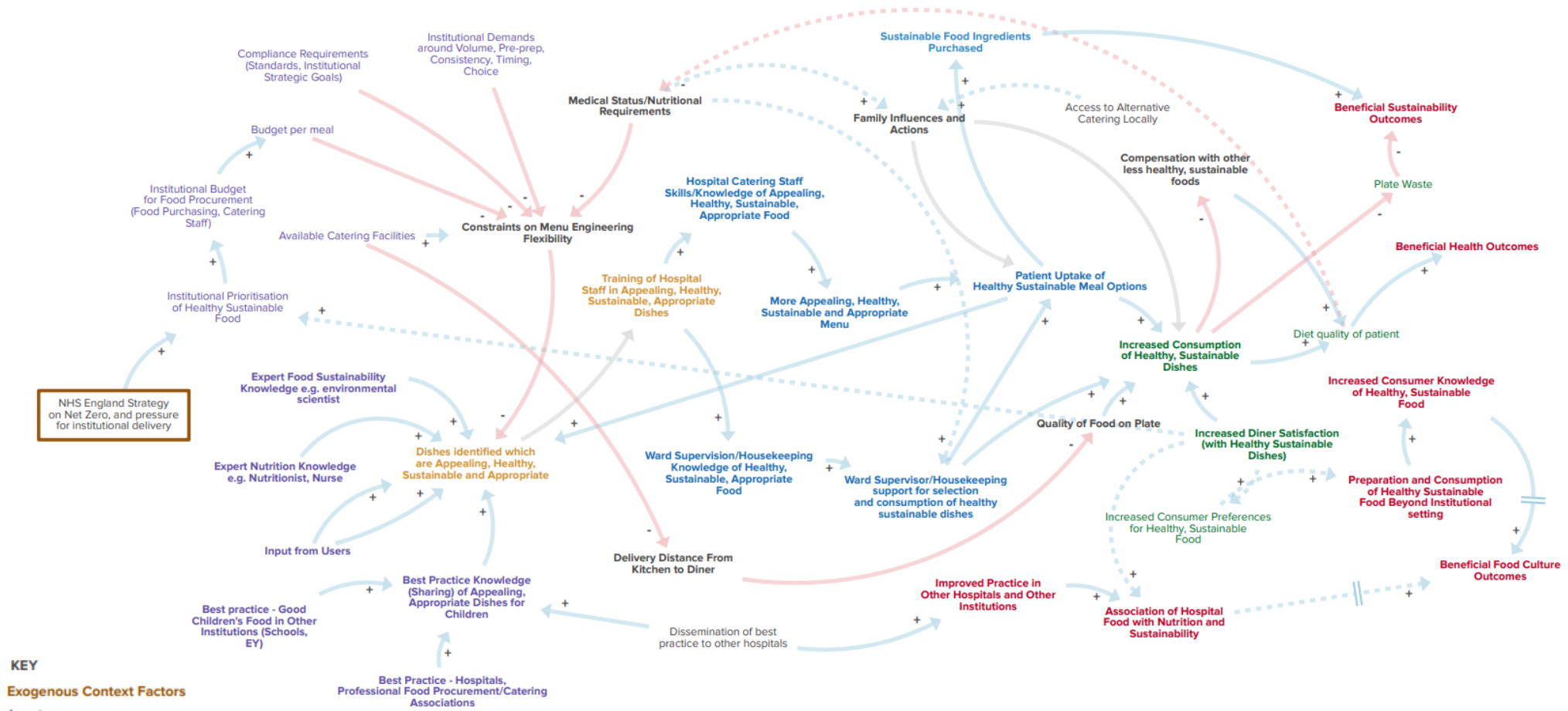




## Qualitative data collection: Semi-structured interviews

*"It's for credibility and the rigour that it would bring, we could...[laughing] Owen has pointed out the flaws in our measuring mechanisms of patient satisfaction and the like...it's having that level of credibility. That only an academic research project can bring, really. It's after the event measurement and data crunching which we would never stand a chance in a million years of doing. I suppose that's the key benefit for me. We'd have to have tried it. We'd have had to have tried something. But it wouldn't have...it wouldn't be as closely watched. It wouldn't be as well managed. You know it's the discipline the process brings. But if it was ...it's a bit unfair saying this, but if it was just them messing around in the kitchen and experimenting with new bits and pieces and, you know, it's not measured and it's not precise and you know, it's the rigour."*

*"I get a bit wound up by people sort of suggesting that we should just impose change on people. Who are we to say that? You know, little Joseph on Ward Two should only have a vegetable lasagna and not a meat-based lasagna. You can't force choice. And those people that think we do, or we can and we should, I think fundamentally are wrong. If we were in the middle-class area, treating patients in their 20s and 30s and 40s maybe...that's the sort of target group you know, they're the sort of people you see queuing up outside... I think it was a new vegan shop [I went past the other day] and it was full of students queuing up outside, you know, so you're talking about educated young people. It might work but...with the demographic we have. Never."*



# Theory of Change-based Causal Loop Diagram of Intervention



# Discussion

## Study contribution:

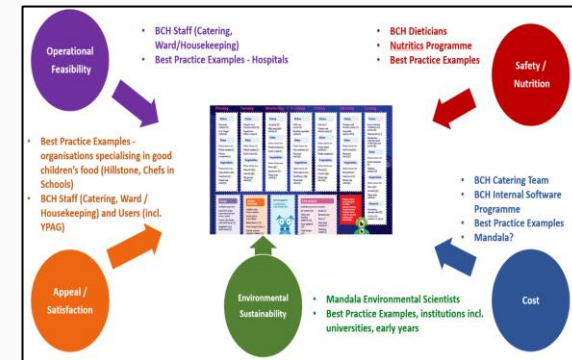
- Lens on institutional catering system as a site for food system transformation
- Insights into barriers and enablers of transforming institutional catering in a paediatric hospital setting
- Replicable process for intervention identification and co-design with wide applicability.
- Insights into role of co-creation (across research and intervention design)

## Strengths of the approach:

- Fostering strong collaborative relationships between researchers and delivery partners
- Co-creation at multiple stages
- Deep understanding of a novel intervention and setting.

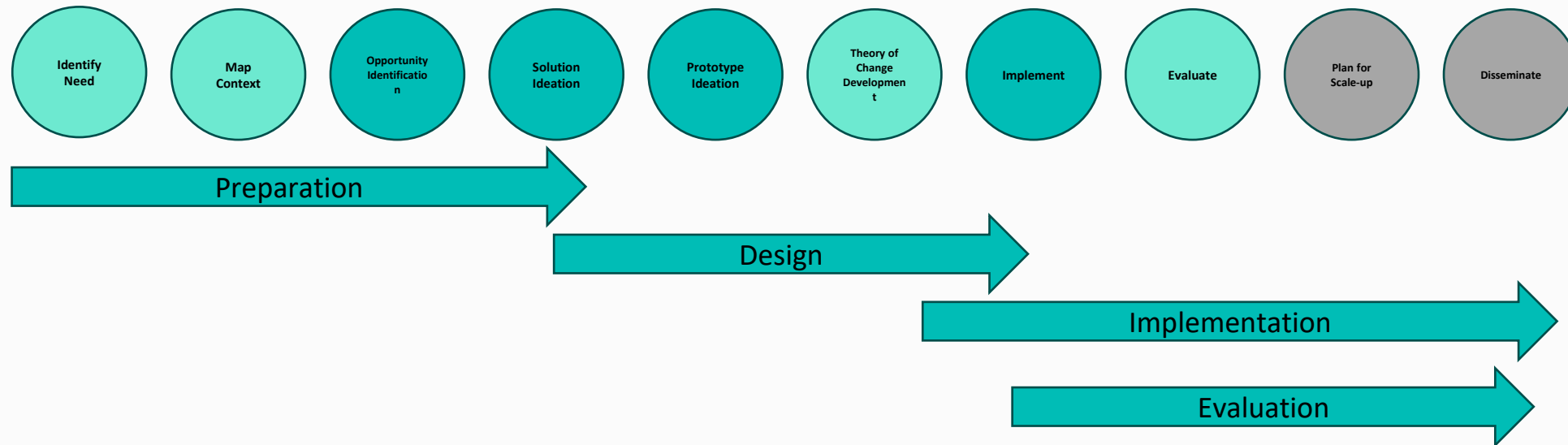
## Potential limitations:

- Applicability to other institution types
- Time required



What could be co-designed	Application to case study
Identifying need (Research problem/question/scope)	Already set before stakeholders became involved
Vision for future system	Did not do
Mapping Context	IC stakeholders - incl BCH - had role in initial qual research on B'ham food system and participated in institutional catering workshop Fed back on system map and intervention ideas but largely responding to scientific team products
Intervention Ideation/Selection	Discussions with IC stakeholders on possible interventions Discussion with intervention organisations Small group meeting with BCH to discuss possible (shortlisted by Mandala team) interventions
Prototype Ideation	Knowledge exchange workshop with best practice experts Reformulation approach
Theory of Change Development	Informed by knowledge exchange, meetings, workshop (+ literature)
Research Design Data collection Data interpretation	Evaluative study - role in understanding: setting and processes; relevant outcomes; available data
Planning for Scale-Up	Will be co-authors on toolkit May be involved in knowledge translation activities
Dissemination	Discussion on internal and external comms Involved in planning film content

## Illustrating the role of co-creation in a project



Source: Authors, based on Vargas et al 2025



## Conclusion and Questions

- Identifying and developing food system interventions and evaluation requires significant resources (cf evaluation of an existing initiative)
- Significant amount of collaboration with stakeholders does not result in intervention actions
- Multi-stage co-design should support a more effective intervention

### Questions:

- Is it useful to include the stage of intervention and stakeholder identification and matching prior to the hospital menu intervention?
- Are there existing frameworks for what can be co-designed?
- Is the framework of what can be co-designed useful; are there other stages which should be included?



Thank you  
[Kelly.parsons@mrc-epid.cam.ac.uk](mailto:Kelly.parsons@mrc-epid.cam.ac.uk)

