Public Health Jersey

Applying systems thinking to inform the Government of Jersey Food and Nutrition Strategy

A report on the findings of a Group Model Building Workshop

Société Jersiaise, St Helier, Jersey

Thursday 4th May 2023

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Executive Summary

Background

Worldwide, diets and food supplies are sub-optimal with regard to health and sustainability, contributing to excess diseases and deaths, as well as climate change impacts. These problematic outcomes lead to significant costs for health services, societies and governments that are not covered by the food system (i.e. external costs or externalities). Understanding the drivers of these unwanted outcomes within and beyond the food system can help to determine solutions. The Government of Jersey is refreshing its food and nutrition strategy. It therefore commissioned a team from the University of Cambridge, UK, to support a review of present policy, and work with food system stakeholders to develop an improved understanding of systemic drivers of problematic food system outcomes on the Island. The ultimate aim is to reshape Jersey's food system and culture so that it becomes easy and normal for every Islander to eat food that is nutritious, delicious, affordable and sustainable, and for Jersey's food system to thrive.

Methods

Before the workshop we conducted qualitative research with a purposive sample of members of the public. This gave insight into Islanders' priorities and provided real-world context for the mapping exercise. We then delivered a one-day workshop for stakeholders from across the food system, with representatives from government, health, civil society and the commercial sector (agriculture, logistics and retail) and civil society. During the workshop participants identified strengths and weaknesses of the island's current food system and explored how these were associated with each other. Using this information, the Cambridge team developed a draft conceptual map (a Causal Loop Diagram) of the Jersey food system, during the workshop. Participants then used this draft systems map to suggest potential interventions to build on perceived strengths and address identified problems.

After the workshop the map was further developed using other food system maps and evidence reviews. Beneficial and unwanted outcomes were added.

Findings

Workshop participants generated a list of more than 40 food system variables that affect the supply and consumption of nutritious foods and identified connections between them. An initial system map was generated, and participants identified 17 potential interventions that could be delivered to address these problems. Subsequent iteration of the system map drawing on existing evidence helped to expand the list to more than 75 potential interventions, to be explored and prioritised in the government food strategy development process. The completed map provided, for the first time, an overview of Jersey's food system, showing a wide range of variables associated with diet and sustainability as well as potentially powerful leverage points for change.

The resulting shortlist of potential interventions, rooted in a co-produced understanding of the Island's food system and an appreciation of existing evidence, provides a cornerstone for the revised strategy. Its aim is to reconfigure the system to improve outcomes for health, sustainability, equity and the Jersey economy.

Conclusions

Applying systems thinking and associated tools provided a valuable input to the food policymaking process in Jersey, helping to identify key challenges and potential solutions that can be considered further in the development of the Jersey food and nutrition strategy. The mapping process was also instrumental in building relationships with partners across the food system.

Background

Food and health

The food we eat is a powerful determinant of our health. Diets that are sub-optimally healthy are responsible for a high proportion of excess mortality and morbidity from non-communicable diseases (NCDs) in populations worldwide.[1] This share of the global burden of disease is now greater than that attributable to tobacco smoking.[2] Many of the NCDs resulting from unhealthy diets are related directly or indirectly to excess body fat, which drives a complex range of metabolic consequences.[3]

Excess body weight[1] at an individual level results from an imbalance of energy consumed versus energy expended. The balance of foods in the diet (as distinct from calorie content *per se*) also plays a role in body weight and health. A diet with abundant highly processed foods appears to have a negative influence on health outcomes, although mechanisms are as yet unclear.[4] Conversely, a nutritious, balanced diet of predominantly unprocessed and minimally processed foods is health promoting.[5] Mechanisms for the different impact of highly versus minimally processed diets on health have been proposed, for example via impact on the intestinal microbiome, (which in turn influences health);[6] or through differential absorption of nominal calories in highly versus minimally processed foods, affecting body weight.[7]

Key determinants of body weight are dietary energy intake and energy expenditure due to physical activity, but their effects are moderated by metabolic factors at individual level, some of which are genetically determined. This means that some people are more susceptible to excess energy intake and/or insufficient activity than others, resulting in greater conversion of excess energy into excess body fat.[8] At a whole population level, there is a diverse range of factors that affect the likelihood of excess energy consumption or insufficient activity, including commercial food environments, the built environment, societal values and social norms and conventions.[9,10,11]

Levels of obesity have been increasing worldwide over the last ~50 years, initially in high income countries and increasingly in middle- and low-income countries. In high-income countries, prevalence of obesity is strongly patterned by socio-demographic factors, tending to be more common among men, lower income and some ethnic minority groups, and increasing with age in adulthood until retirement age. Health outcomes associated with excess body weight are also therefore strongly patterned socioeconomically, resulting in marked inequalities in health.[11]

Obesity in childhood has emerged over the last 30-40 years in high income countries and is a particular concern because it strongly predicts adult obesity.[12] Excess body weight is associated with increased risk of non-communicable disease morbidity and mortality, in particular from type 2 diabetes, cardiovascular diseases and cancers, but also contributes importantly to musculoskeletal and mental health problems.[13] Excess energy intake is considered the primary driver of obesity rates; insufficient energy expenditure plays a part and is an important independent determinant of NCDs, but increasing activity alone in the context of everyday lives is unlikely to make an impact on obesity.[14] Improving population diets is likely to have a range of other benefits, independent of excess body weight, including for oral health and reducing cancer risk.[5]

Finally, while there is strong evidence of the link between poor quality nutrition and poor health, this same evidence base can be framed positively, i.e. that nutritious diets protect health at both an individual and population level.

[1] Defined here as an adult BMI >25Kg/M^{2,} or equivalent standardised metrics in children. 'Obesity' is used as a shorthand in this report to include all categories of BMI over 25Kg/M^{2,} Excess body weight is widely considered a proxy for excess body fat.

Food and the planet

The world is now deep into a climate emergency that has seen global temperatures rise significantly above a baseline considered safe in terms of damage to global ecosystems. Governments worldwide have set targets to achieve reductions in carbon dioxide and other emissions responsible for global warming. It is considered vital that the global average temperature increase should be limited to 1.5°C. Beyond this, the risk of irreversible and accelerating ecological damage is considered exponential and an existential threat to humanity.[15]

The food system – including agricultural production, processing and manufacturing, as well as all aspects of food retailing – is responsible for a substantial proportion of greenhouse gas emissions. It also contributes to planetary environmental degradation through land and water pollution, biodiversity loss, soil degradation, water depletion and other mechanisms. The extent of these contributions to climate change and local ecological damage has led to worldwide calls for urgent food system transformation.[1 16 17]

The food system and the economy

The commercial food system typically contributes substantially to national economies in high income countries. Approximately 7% of gross domestic product (GDP) is attributed to the food system in the UK. These economic contributions come from agriculture and fisheries, processing and manufacturing, wholesaling and retailing, and associated financial and logistic services.[18]

Tackling unhealthy and unsustainable diets

Understanding the factors that are driving the epidemic of obesity and NCDs is critical to identifying and implementing interventions that will stand a chance of reducing population risks. There is little evidence that any country has yet reduced obesity rates, although some promising interventions, such a sugary drinks taxes and advertising bans are emerging.[19 20 21] Nevertheless, obesity is widely regarded as an intractable problem that has not responded to traditional public health interventions. For example, the scale of the problem is such that efforts to reduce obesity and type 2 diabetes prevalence through behavioural interventions at an individual level are likely to be too costly to deliver and sustain for the numbers of people who would need them. Such interventions are also insufficiently effective to offer a reliable solution to obesity at a population level.[22]

Similarly, although there is now a sophisticated understanding of how to reduce risk of climate change, and how to mitigate such risk, progress on developing and implementing interventions is dangerously slow. Too much emphasis has been placed by governments on individual behaviour change by citizens and insufficient emphasis on whole population, low-agency and system-level solutions.[23]

At the heart of both the challenges of unhealthy diets and food system impacts on the environment is a misalignment of goals.[24] The primary goals of key sectors of the commercial food system (profits and growth) are currently widely divergent from the goals of public health and climate change (promoting and improving population health, and reducing and mitigating climate change).[24] This is not just because unrestricted growth is unsustainable for both human and planetary health, but because profits and growth are generated more readily by the production and marketing of less healthy and less sustainable foods than by the production and marketing of more sustainable and healthier foods. This situation has arisen because the food system responded to drivers such as absolute shortages of food in the early 20th century, and demand for convenience and cheaper foods in the mid to late 20th Century.[25] Today's problems with food are the unfortunate and unforeseen consequences of this evolution of the food system over time.

But, as always, the picture is complicated and alongside the many challenges of the current food system, there are examples of 21st century innovation that prioritise health and sustainability, while delivering delicious food to citizens.[26] We need to learn from these examples. However, despite this potential, there will be a need for the system to evolve in ways that encourage and shift the commercial food system

towards closer alignment with health and sustainability goals – by the production and marketing of foods that are good for people and the planet, and the reduction of production and marketing of products that are damaging to people and the planet.

Food system interventions with the best chance of making an impact on population and planetary health will need to be delivered at the whole population level, irrespective of individual risk, and will need to make minimal demands on individuals in order for the intervention to be effective and equitable (so called low-agency interventions).[27-29] It is also likely that interventions will need to be systemically powerful – that is, they will represent powerful levers for change in underlying systems that influence food consumption. Such interventions may be considered 'disruptive', in that they help to reshape a system such that it favours desirable outcomes (e.g. reduces promotion and sales of energy dense and poorly sustainable foods, or facilitates the provision of healthy and sustainable foods by changing the goals and structures of the system).[30-33] This might be achieved either by regulating the existing food system, which is dominated by corporations maximising sales from processed foods, or by stimulating alternative business models with a focus on unprocessed and minimally processed foods. The role of grassroots and community-based initiatives should also be considered, as well as the means by which communities can be empowered to lead change.

Current evidence suggests that even seemingly powerful interventions, such as sugary drinks taxes, may not be sufficient *alone* to reduce obesity levels or make important impacts on carbon emissions, and it is highly likely that a number of interventions delivered concurrently over time will be needed. A key challenge is that systems constantly adapt over time in order to achieve equilibrium with regard to their underlying goals (e.g. profits and growth).[34] The policy world also therefore needs to adapt and ensure that interventions change as necessary to maintain pressure on the system – for example, by increasing a food tax rate in line with inflation, so that it does not devalue over time. This approach has been successful in reducing smoking rates.[35] Another idea is to use fiscal, regulatory and other measures to make food retailing that is aligned with public health goals more commercially attractive, perhaps with a focus on smaller, local businesses.

A further challenge is understanding how the range of levers addressing the food system – targeting different activities and outcomes – interact with one another. This range of levers addressing the food system are spread across a wide range of sectors, many of which might not traditionally be associated with food and nutrition.[17 36-40] For example, policy mapping in the UK has identified at least 16 national government departments with a role influencing the food system.[41 42] Looking across the system as a whole, rather than considering levers in isolation, can suggest how diverse but complementary policies might be combined, or 'packaged' to improve their effectiveness, and improve coherence between actions.[37]

Diagnosing the problem at a systemic level

The food system can be conceptualised as a complex adaptive system. A complex adaptive system comprises non-linear dynamics including: (a) vicious, virtuous and stabilising cycles, and (b) long causal pathways including multiple factors. These features of a system are important in both driving change in desirable and undesirable system outcomes and creating a system which is resistant to external influence. By developing a detailed understanding of the dynamics of a system, we gain insights that help us to change the system – identifying ways to shape how it works and ultimately encourage more desirable outcomes.[30 43] In line with the terminology used to describe complex adaptive systems, we will hereafter refer to vicious and virtuous cycles as reinforcing feedback loops, and stabilising cycles as balancing feedback loops.

A key way to identify what could potentially be done to help shift towards healthier and more sustainable diets is to examine in detail the systems driving excess energy intake and less sustainable food production and consumption. Through mapping out systems, it is possible to identify and elucidate feedback loops, and other elements of the system that generate unwanted outcomes, and then identify

the potentially most powerful places to intervene in the system (leverage points).[34] Mapping systems can also act as a valuable way to engage stakeholders in the policy process by sharing a holistic view of the system from multiple perspectives.[44 45] It can benefit policymakers by helping to shift thinking towards more innovative, powerful solutions, better able to bring about system reconfiguration. Perceived benefits of engaging stakeholders, through co-creative policy development, include that it leads to more effective and more implementable solutions, increases ownership in those who will need to implement actions, and provides citizen support for interventions, enhancing political feasibility.[46]

Alongside such system mapping it is helpful to map existing interventions on to the system and undertake 'solution scanning' to identify promising new solutions that have been proposed or are already being implemented and tested globally. Solution scanning is a key tool which can identify potential actions and provide a counter to more *ad hoc*, bounded policymaking tendencies which often revert to a small range of established policy options.[47-49] While a subset of possible interventions identified through solution scanning may have evidence of effectiveness or cost-effectiveness to back them up, it is important to recognise that governments have not yet managed to reduce obesity rates anywhere in the world on the basis of present evidence, which usually takes a number of years to generate, so is inherently out of date. Similar issues exist with environmental sustainability actions. Policy innovation tends to be ahead of research evidence in the field of population health, unlike clinical medicine.[50] Nevertheless, a review of current evidence is usually helpful to provide a solid foundation for action, either for specific interventions or for underpinning theory to support policy innovations. It will also be important to evaluate rigorously any novel interventions delivered as a result of the updated Jersey food and nutrition strategy, so as to add to the emerging evidence on food system interventions.

Diet and Obesity in Jersey

Jersey does not have a rigorous population-level dietary survey equivalent to the UK National Diet and Nutrition Survey (NDNS). A table in the Appendix summarises the various data sources for dietary and obesity data in Jersey.

Diet

Data from 2023 show about two thirds of adults in Jersey (67%) ate fewer than the recommended five portions of fruit and vegetables a day. On average, more women (36%) than men (28%) ate five a day. Diet quality is socially patterned: 58% of people living in social rented accommodation had eaten fewer than 3 portions of fruit and vegetables in the previous 24 hours compared with 26% of people in owner-occupied housing. Data from 2021 show 39% of Islanders found it difficult to afford fruit and vegetables and 8% lacked the necessary facilities to prepare healthy meals.[51 52]

Our qualitative data show Islanders identify diet as a key contributing factor to improving health and wellbeing.[53] Islanders understand the importance of eating well for health: *"Feeding the body and treating it well is really important"*. Affordability and access is a barrier to eating well, especially for people on a low income: *"[food is] really, really expensive"; "healthy food shops have higher prices than food in standard shops, the cost is different"; "You have to take the bus, go around six different farms"*. Working patterns, time poverty and convenience also influence food choices. Many Islanders reported that they could not afford healthy food and turned to alternatives, often unhealthy and processed foods, despite knowing the health implications: *"time is a big thing, so a lot of the time, time convenient food is the option. It's usually tending to be the unhealthiest"*. Islanders have also identified local food as important to them, and in particular want to see more support for local produce, farms and farmers.[54]

A majority (>70%) of children and young people were aware of the importance of eating five portions of fruits or vegetables per day (5-a-day), but a minority (>30%) ate 5-a-day the previous day. The proportion of children and young people eating 5-a-day decreases with age, from 38% (Year 4) to 18% (Year 12). Pupils in fee-paying schools were significantly more likely to have eaten their 5-a-day (38%) compared to pupils in non-fee-paying schools (27%). About a fifth of children and young people ate

High Fat Salt and Sugar (HFSS) foods every day. A higher percentage of Year 10 and 12 pupils ate HFSS foods on most days (approximately 45%) compared to other Year groups (approximately 30%). [51]Obesity

In 2023, 44% of adults self-reported a healthy weight, and 54% reported being overweight or obese (noting self-reported rates tend to underestimate obesity). These proportions have remained stable for the last 15 years. Men (59%) were more likely to report being overweight or obese than women (48%). In 2022/3 24% of reception children were overweight and obese (14% overweight, 9% obese). 32% of year 6 children were overweight or obese (13% overweight, 18% obese).

Summary

Jersey data on diet, obesity and related inequalities, although more limited than those of larger jurisdictions, paint a picture consistent with trends in the UK, Europe and other high-income countries. A majority of people of all ages do not eat a healthy diet, and those with fewer resources have, on average, a poorer diet than their better-off peers. Childhood and adult obesity are significant public health problems, with rising rates in children and known inequalities by proxies for socioeconomic status.

Jersey's Wider Food System

Food Production

Jersey Royal potatoes and Jersey dairy are the main farming activities, although pockets of more diverse agriculture exist. These are now incentivised by an innovative Rural Economy Framework which supports sustainable and diverse production. Economically, agricultural sector Gross Value Added is in decline and a high percentage of industry profitability is dependent on direct and indirect subsidy, as is common in most developed economies. Production is fairly intensive for a number of reasons, which include limited land and the dominance of mono-cultural crops. Reliance on the Jersey Royal potato crop has been accentuated by the reduction in other economically viable alternative vegetable crops; high production, labour and transport costs limit the competitiveness of Island exports to the traditional UK market. The dairy sector has now reduced to 12 producers, although significant improvements in productivity driven by improving genetics and the development of new value-added export markets have improved profitability.

Other food infrastructure

A review published in 2018[55] identified the following food infrastructure on the Island:

- The Jersey Dairy
- The abattoir and knacker's yard
- Sorting and packing operations operated by producers of Jersey Royals
- Purification units for processing shellfish before they enter the human food chain, operated by Jersey's aquaculture businesses
- Landing and loading facilities at Jersey's harbours (e.g. for the import of fertilizers and feed)
- Smaller-scale elements of infrastructure, such as artisan bakeries and butcheries.

Supply and Trade

Jersey is wholly self-sufficient only in fresh cows' milk and new potatoes. Approximately 80% of locally consumed produce is imported from or through the UK by the major retailers and some wholesalers, which supply the catering trade and smaller shops.. Some food retail franchises (e.g. M&S) do not sell local produce except where required by law (e.g. Jersey milk). Others are more supportive of local produce, for example Waitrose, sold approximately £10m worth of local products in its three Jersey stores according to 2014 figures.[56] Supply comes via a ferry for bulk materials and containers between the UK and Jersey (operated by Channel Island Lines, St Helier). There are also smaller-scale freight services between St Helier and France. In terms of exports, the vast majority of agricultural produce exported goes to the UK.[56] Farming also relies on imported inputs, such as fertilizers and feeds.

Impacts on consumers

Food costs can be considerably higher than in the UK. A comparison in June 2015 indicated that Jersey prices were approximately 33% higher than the UK for fresh fruit; 39% higher for fresh vegetables, 17% higher for meat and 12% higher for fish.[55] There is significant support for increasing local production and consumption from Jersey citizens: a 2020 consultation and research project on Islanders' views on local food production and consumption found high support (82%) for more support of local produce, farms and farmers.[54] A recent increase in funding by government for subsidies to farming and fishing under Jersey's Rural Economy Framework (albeit from a low base) shows Government policy is in line with the voters' views.[57]

Jersey's Food Policy

Jersey has an existing Food & Nutrition Strategy (FNS) (2017-2022),[58] which was led by the Strategic Public Health Unit and described as a 'cohesive system-wide strategy'. It was based on the principle that public health strategies must expand beyond campaigns and education aimed at changing individual behaviour, to take into account '*environmental factors such as access (including price), availability, cultural norms and expectations*'.[58] The range of actions listed can be found in the Appendix.

Previous (governance) approach to systemic/cross-cutting working on food and nutrition

The 2017-2022 FNS is described as a 'cross-government approach', with 'central government ownership', supported by 'Cross departmental working for food and nutrition' as underpinned by the States of Jersey Island Vision framework.[58] A large number of departments are identified as relevant to delivering on the themes of 'promoting healthier diets', 'weight management' and 'healthier food environments':

- Customs
- Education
- Economic Development
- Environment
- Health and Social Services
- Planning
- Primary Care
- Procurement
- Social Security
- Sport
- Tourism
- Treasury and Resources.

The FNS proposes a 'multi-sectoral approach', with action to be delivered 'through a multi-sector alliance'. A 'Food and Nutrition Strategy Steering Group' – reporting to the Medical Officer of Health, and annually to the States of Jersey Council of Ministers – is proposed to be responsible for 'ongoing monitoring of identified indicators, providing updates on progress and challenges relating to the implementation of actions, and reviewing evidence based solutions and strategies for moving forward', with biannual meetings.[58]

Previous approach to addressing coherence across food system policies

The interdependence of the FNS with other policy sectors and goals is acknowledged, including 'specific interdependencies' with the following policies, but with no details of synergies and/or trade-offs:

- P82/2012 'A New Way Forward for Health and Social Care'
- Early Years and Childhood Partnership
- 'Fit for the Future', the Sports Development Strategy for sport and physical activity in Jersey
- 'Jersey's Sustainable Transport Policy', Department for Infrastructure.[58]

The FNS is described as complementing but not addressing 'the challenges and practicalities of local food production and sustainability, and issues around expanding organic food production and reducing nitrate levels in our water supply', which 'are addressed within the States of Jersey Rural Economy Strategy.[58]

Strategy Implementation

There are no formally documented outcomes or outputs of the strategy. Subsequent to the above being ratified and agreed, a reduced funding package was allocated to delivery of the 2017-2022 Food and Nutrition Strategy.[59] The decision was therefore taken to focus limited staff capacity and funds towards provisions for early intervention prevention services and initiatives in early years and primary school settings. An overview of activity launched and currently provided through this approach can be found here.

In addition to the Food and Nutrition Strategy, there are a range of other Jersey policies of relevance to the Island's food system (Table 1).

Table 1: Selected Jersey Policies of Relevance to the Food System and future FNS

Policy	Policy Lead	Details
Rural Economy Strategy (2017-2021)[56]	Joint strategy between: • Department of the Environment • Department for Economic Development, Tourism, Sport and Culture	• Includes aims to support sourcing and selling of local agricultural produce, using a local grocery 'hub' (backed by Jersey Farmers Union and in cooperation with other smaller existing arable farmers), to profitably increase output and sale of local fresh vegetables
Rural Economic Framework (2022)[54]	The Rural Economy sector within the Department for the Economy	Within the framework are five strategic areas of focus: 1. Rural Governance: Management of the rural economy by Government, in both a local and international context 2. Rural Support: A structure to provide direct financial support to the rural sector in a manner compliant with international trade obligations 3. Land and Ecosystem: Ways in which to maintain and enhance the rural environment and ensure sustainable uses of resources 4. Communication and Marketing: Greater promotion of the sector locally and internationally 5. Rural Development: Policies designed to enable sustainable development of the sector, some requiring further research to be delivered throughout the life of the framework. Of particular relevance is Policy RD3 ('Food Production for the Local Market') which outlines aspirations for promotion

Policy	Policy Lead	Details
		and support of food production and taking proactive measures to reverse the recent decline in locally produced food, e.g. in consideration of 'introducing new pathways to encourage smallholders to contribute to the supply of local food for the domestic market'
Carbon Neutral Roadmap[60]	Department of the Environment	• Commits Government of Jersey to 'an ambitious, science-led emissions reduction trajectory that aims to meet our desire to become carbon neutral by 2030' • Identifies risks of food shortages and threats to food production • Notes the potential for use of second-generation renewable diesel made from hydro-treated vegetable oils, waste food and meat processing by-products and need to ensure it is not made from crops that would otherwise be used as a food source • Presents imagined scenarios whereby agricultural practices reduce/capture greenhouse gas emissions and a significant number of Islanders switched to low-carbon diet, supported by carbon labelling. No further details of actions to support these aims related to food production and diet change.
Action Plan to support Organic Farming 2014[61]	Department of the Environment in conjunction with Jersey Organic Association – Producers Group	Aims included coordination of local organic supplies to the marketplace to maximise local availability and value, through work with local and national supermarkets, development of marketing materials and training, an educational programme for citizens, and a review of procurement protocols.
Jersey's Citizens' Assembly on Climate Change[62]	States of Jersey	• 15 virtual meetings between March and May 2021. • Group of 45 people of different ages, different genders, different backgrounds and places across Jersey with different views on climate change. • Focus was 'on the two biggest sources of the Island's greenhouse gases: transport and heating, cooling and cooking' (energy-related to cooking only) and therefore food was not addressed.

Aims of this work

Overall strategic aim

To reshape Jersey's food system and culture so that it becomes easy and normal for every Islander to eat food that is nutritious, delicious, affordable and sustainable, and for Jersey's food system to thrive.

Strategic objectives

To increase the affordability, availability and consumption of healthier, nutritious, more sustainable, (and where possible, locally produced), foods, especially for those on low incomes.

To decrease the consumption of less healthy and less sustainable foods, in particular highly processed and energy dense foods high in salt, fat and sugar, especially for those on low incomes.

Workshop questions

In the workshop, we aimed to answer the following questions:

1. Why are most people's diets in Jersey relatively unhealthy and unsustainable?
2. How can we help more people in Jersey to eat a healthier and more sustainable diet?

Below we outline the methods used to answer these questions collectively.

Methods

Mapping the Jersey food system

A participatory method called Group Model Building was used to:

1. Visually map the factors, and connections between factors, which sustain a food system that does not currently support healthy and sustainable diets in the context of Jersey.
2. Interrogate this map of the food system to identify leverage points and potential interventions which could help shape a food system that does support healthy and sustainable diets in the context of Jersey.

Participants

To obtain a comprehensive and non-biased view of the current food system, stakeholders from across the system were invited to participate in a one-day Group Model Building workshop. Stakeholders were identified and invited by email by the Government of Jersey Public Health Directorate. There was strong support from the public, commercial and civil society sectors. Stakeholders represented all parts of the food system: production, processing, distribution, commercial retail, institutional catering, community food provision, hospitality and out-of-home retail and dining. Stakeholders from adjacent systems also participated (e.g. education, housing, competition regulation), as well as from Guernsey. A total of 23 participants attended the workshop. Participants worked enthusiastically in plenary and in three breakout groups that were designed to each have a mix of stakeholders from across the food system.

Incorporating the views of Jersey citizens

Prior to the workshop, the Public Health Directorate Team conducted three focus groups with the public. The three groups involved participants from across the social spectrum, including ethnic minority groups and low-income households. Preliminary findings from the focus groups were presented to workshop participants to acknowledge the public's view on the challenges in the food system and preferred actions to tackle these challenges. At the end of the workshop, the public views were reflected on again, to highlight areas of alignment with stakeholder discussions. A full report[63] on the qualitative work can be found here.

Workshop design and delivery

The workshop was held at Société Jersiaise, St Helier, on Thursday 4th May 2023. MW, AS and KP (hereafter referred to as the Cambridge Team) facilitated the workshop. Members of the Public Health Directorate convened and introduced the workshop, made the practical arrangements and took notes to facilitate the writing of this report.

Explaining our approach

Prior to the workshop, a short concept note was shared with participants to outline the rationale for a Group Model Building workshop. Participants were asked to attend the workshop for the full day to ensure their involvement in visualising the system and using that visualisation to identify interventions with the potential to bring about positive changes in the system. During the workshop, some background was presented on health and environmental outcomes pertinent to the Jersey (and similar)

food systems, complex adaptive systems, causal loop diagramming and principles of effective intervention design.

Visualising the causal mechanisms underlying the food system

A visualisation of the system of causal mechanisms underlying Jersey's food system was produced in three steps.

Firstly, participants were asked to identify the upstream and downstream factors important to the food system and its human and planetary health outcomes. Participants were asked to think about the whole food system (from production to consumption and waste) and individually identify five factors that contribute to an unhealthy and unsustainable diet. Participants shared their most important factor in plenary; if this factor had been shared by another participant, they were asked to provide their next most important factor. Factors were listed on-screen and using sticky notes.

Secondly, participants specified the connections between listed factors. Each identified factor was added to a sticky note and these were arranged around the outside of a circle drawn on a large (A0 size) sheet of paper for each breakout group (a 'connection circle'). In three breakout groups, participants discussed connections between factors and how factors influenced one another – these were recorded on the circle by the group facilitator. Where possible, connections were directed (i.e. recording whether factor A causally affected factor B, or vice versa) with a specified polarity (i.e. whether that causal effect represented a positive association – change in factors went in the same direction, or a negative association - change in factors went in opposite directions). If there was consensus in the group, factors were added or combined. This process resulted in one 'connection circle' for each breakout group.

Thirdly, the Cambridge Team rapidly translated the connection circles into a preliminary version of a causal loop diagram (CLD). A CLD is a qualitative representation of the hypothesised causal pathways that lead to specified outcomes of a complex adaptive system. The preliminary version of the CLD (Version (v) 0) was presented to and discussed with workshop participants. Participants were given the opportunity to amend, verify or comment on the CLD.

Identifying leverage points for intervention

Participants were asked to consider what needed to change in the food system to support healthier and more sustainable diets. The CLD was used to describe the importance of leverage points: places in the systems where small changes could reverberate to other parts of the system, producing larger impacts. In three breakout groups, leverage points were identified by hypothesising which factors and causal connections in the CLD:

(a) Were most important to the way the system works
(b) Could feasibly be changed
(c) Would likely have repercussions for other parts of the CLD if these factors or connections were changed.

Leverage points were shared from each breakout group and discussed in plenary to identify priority leverage points for further discussion.

Developing interventions ideas

Some essential principles of intervening at the population level were presented in plenary, so as to frame discussion of intervention ideas. These included the nature of powerful system interventions, the strengths and limitations of population vs targeted approaches, the role of individual agency and impacts on equity, and the importance of synergy between intervention modalities.

Three priority leverage points were allocated to each breakout group. Participants were asked to generate ideas for interventions that could be applied at these leverage points. Interventions were defined as organised activities or policies implemented over a specific period of time and intended to

result in the import, production or delivery to consumers of healthier and more sustainable food. Intervention ideas were reported back to the group in a closing plenary session.

Post workshop follow-up activities

Critical review of initial CLD

The preliminary CLD developed during the workshop was refined and elaborated to create an enhanced version (v1). The preliminary workshop CLD included most but not all connections and factors featured in the three connection circles. Following the workshop, the connection circles were further scrutinised and missing variables and connections added. In line with usual practice for refining CLDs, the Cambridge Team then looked for factors and/or connections that could be synthesised and connections which were deemed 'redundant' (i.e. participants' explanation of the connection between two factors suggested it was an indirect connection via other factors; if the connections through those other factors were included, the connection between the two original factors was deemed redundant and deleted). The Cambridge Team also critically appraised each factor and connection against their tacit knowledge derived from deep engagement with food system research.

Generating a refined CLD with evidence

A second and improved version of the CLD (v2) was generated with reference to existing knowledge, including food system CLDs developed in a recent research programme (The Mandala Consortium), and further insights (i.e. additional factors and connections) identified from existing theory and evidence. We compared the Jersey CLD with four CLDs that focus on subsectors of the food system in the city of Birmingham (UK): grocery retailing, out of home food environment, institutional catering and the community food sector.

We also added the outcomes agreed at the workshop (see above) to the CLD, to provide stronger explanation of how the food system problems identified in the workshop generate unwanted outcomes. Lastly, we checked all nodes for consistency, in terms of their framing, and all connections to ensure that no pathways had been missed or were duplicated, and that all were explainable on the basis of existing theory or evidence.

Enhancing the list of potential ways to intervene in the system

First, we scrutinised v2 of the CLD to identify key feedback loops, problematic outcomes and potential leverage points. This process confirmed all leverage points proposed during the workshop. In addition, it indicated a number of additional leverage points and possible interventions, which were added to the intervention table.

The following headings were included in the intervention table:

1. *Feedback loop, problematic outcome or leverage point* – identified by analysis of the CLD
2. *Possible interventions* – that could address these challenges, identified by workshop participants and facilitators using expert knowledge, and by interrogation of a food system 'Solution Scan'
3. *Potential for system leverage* – an estimate of the strength of the lever according to the systemic level at which it operates
4. *Supportive evidence and examples* – where this information was available from published sources on the development or implementation of similar interventions
5. *Feasibility considerations* – including political feasibility, practicalities of implementation, acceptability to stakeholders, and other reflections

The list of potential interventions generated in the workshop was first ordered by the first column: feedback loops, problematic outcomes and leverage points. We then enhanced the list of possible interventions, drawing on tables of interventions generated by the Mandala consortium using the feedback loops and leverage points identified in the four Mandala CLDs. Next, we scrutinised the

Mandala solution scan database to identify additional food system intervention possibilities. All new intervention ideas were checked against v2 of the CLD to assert their logic, and then added to the intervention table.

It is anticipated that the CLD and list of potential interventions will be further enhanced following review by participating stakeholders, and as a result of the Jersey Government policy process. Regularly returning to the CLD and updating it over time will help with shaping policy.

Findings and outcomes

Nodes and connections

Box 1 shows the variables leading to a less healthy and less sustainable diet generated by participants in plenary.

Box 1: variables leading to a less healthy and less sustainable diet generated by participants

Cost of living
Wealth
Economic inequality
Availability
Access
Cost of food / affordability of healthier/more sustainable foods
Supply chain length
Short use by dates
Hard to buy local food into food businesses
Lack of public investment in food economy
Perception of value of foods
Reliance on/dominance of supermarkets
Taxation of all foods vs unhealthy foods
Entrenched existing business models of 'Big Food'
Promotion and advertising
Knowledge, beliefs and understanding (food preparation)
Skills (food preparation, experience of growing) – and valuing these
Education of children and adults
Range of cultural influences on diet in Jersey
Cultural priority of food and money we spend on it
Social norms surrounding food
Time pressure / time poor
Lack of cooking facilities
Lack of storage facilities
Lack of places to eat in the home
Family influences on eating
Peer pressure among youth
Established taste preferences
Disordered eating and mental health
Association of social activities/pleasure with unhealthy foods
Disconnect between pleasure and healthy/sustainable food
Poor financial returns/incentives for producers
Financial incentives for processed foods
Lack of subsidy on healthier foods
Power
Support for Islanders
Lack of government support for connecting silos in food system
Lack of government focus on improving the food system
Lack of regulation in schools
Lack of focus on risk reduction
Lack of food system data
Lack of accurate/relevant data
Lack of planning laws that promote healthier food environment

The three breakout groups each generated a connection circle, drawing on this list of variables. Inevitably these were unique, but with considerable similarities (Figures A1-A3, Appendix).

Causal Loop Diagram – the Jersey food system

Version 1

Version 1 of the CLD is shown in Figure A4 (Appendix). This version includes minor changes made during plenary discussion. Participants verified the CLD as a meaningful representation of the Jersey food system.

Version 2

Version 2 of the CLD is shown in Figure A5 (Appendix). An interactive version is available here.

Leverage points and potential interventions

Table 2 presents the leverage points and intervention ideas identified during the workshop. Leverage points were identified by workshop participants, through discussion of powerful and feasible places to act in the system. There was consensus across all workshop participants on the identification and labelling of eight leverage points, presented in Table 2. Broadly, these leverage points were situated within:

- food system governance (government regulation; ensuring good school food; government support and priority for the local food economy)
- food system economy (economic (dis)incentives for (less) healthy and sustainable foods; viability of livelihoods in the food system)
- food accessibility (organisation of food in retail; ease of access to local food)
- and public engagement (using social and public media).

Breakout groups identified intervention ideas that could target each of the seven leverage points (Table 2). Across leverage points and intervention ideas, a strong recurring theme was identified around supporting the supply of and access to local food.

In addition to participants' identification of important 'levers' in the system, leverage points were identified by examining feedback loops driving system behaviour, using CLD v2. For example, the following feedback loops suggest 'lack of accessible food system data' and 'sub-optimal school meals' are implicated in mechanisms spanning multiple parts of the food system (respectively: food governance and political economy; food governance, psychosocial factors, availability and consumer purchasing).

Table 2: Leverage points and potential interventions identified during the workshop

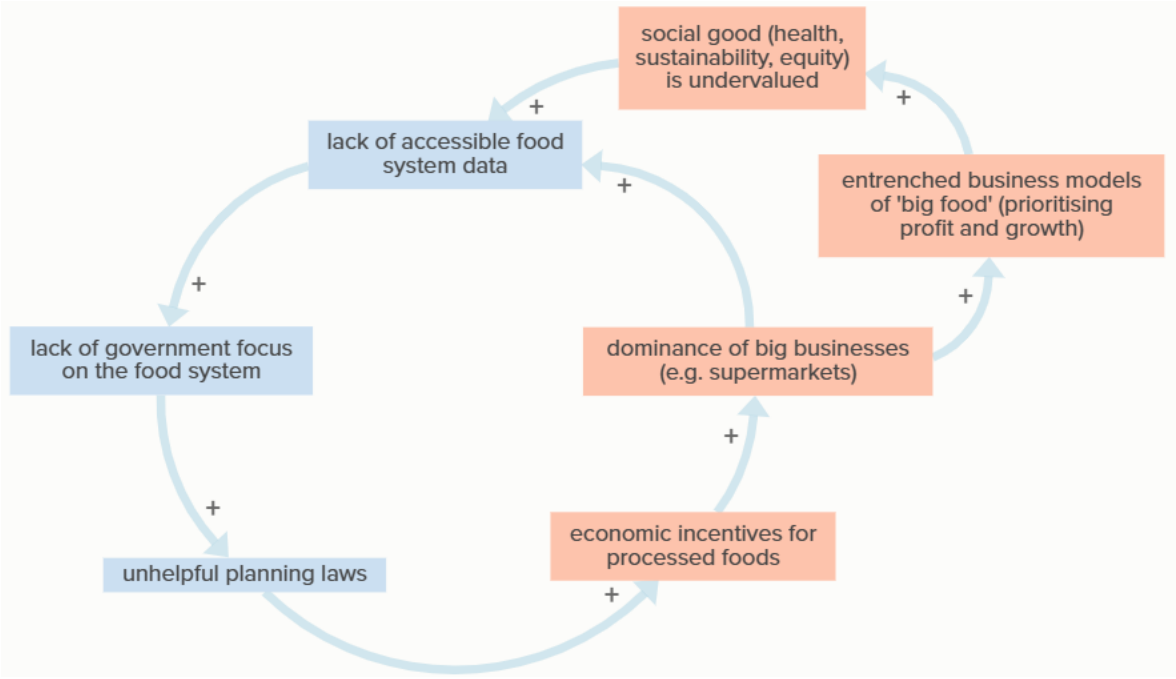
Leverage Point	Intervention Idea
Government support and priority for local food economy	Designated ministerial responsibility. Having a dedicated minister for agriculture and fisheries. Or assistant minister with responsibility due to barriers involved in creating new minister. Or have greater support across politicians and Government – e.g. in scrutiny.
Economic incentives for healthier/more sustainable foods and disincentives for less healthy and less sustainable foods	Tax and subsidy regime for foods, possibly driven by a Nutrient Profile Model. Would need to build on or replace existing food tax regime. May need also to favour locally produced food
	Review of economic support for agriculture/horticulture/fisheries
Government regulation	Nutrition and sustainability labelling
Organisation of food in retailing – Ease of access to food	Present local, healthy and sustainable foods in new ways
	Introduce digital platform/dynamic procurement[2] for local produce and local logistics platform for distribution
	Add a local produce market at the proposed logistics hub
Ensuring good school food	Dynamic procurement for catering provision
	Curriculum development - food education in schools
	Connection to local production
	Use of statutory instruments/social contract between school, parents and children
	School gardens/use of spare land for growing
	School Food Standards and plan
Viability of livelihoods in the food system	Network of stakeholders
	Promoting careers in food industry and retaining talent – education, residency rules, housing/planning restrictions for agricultural land etc.
	Develop more co-operatives
Utilising social, print and broadcast media	No specific interventions identified

Feedback loops 1 and 2 (Figure 1):

These feedback loops suggests that a lack of accessible food system data could be an important leverage point for intervention. Lack of accessible food system data increases the lack of government focus of the food system, which leads to more unhelpful planning laws. As a result, there are increased economic incentives for processed foods, further supporting the dominance of big businesses. This increases the lack of accessible food system data both directly and indirectly by further entrenching the business models of 'big food' which further undervalues social good, providing no inducement for more accessible food system data.

[2] Dynamic procurement is a platform for facilitating access to public sector markets for smaller scale, sustainable growers. https://www.dynamicfood.org/

Figure 1: Feedback loops 1 and 2 – lack of accessible data, entrenched business models and the dominance of 'big food'

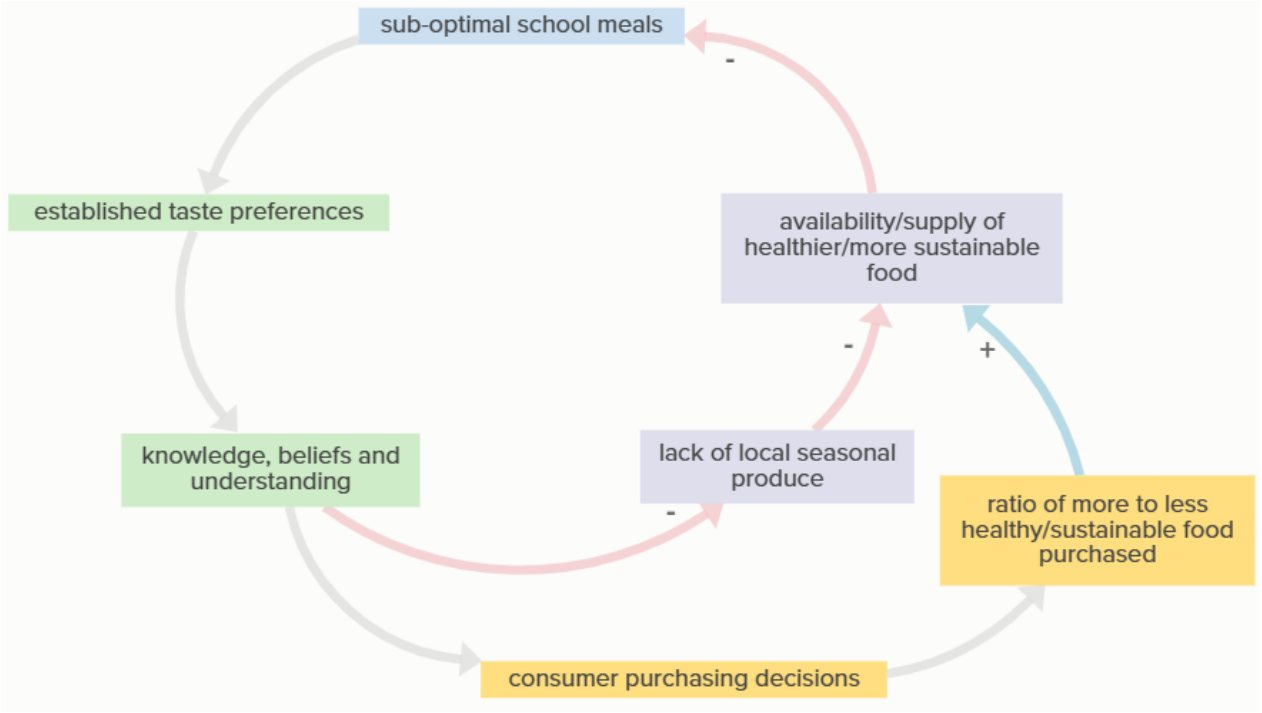


Colour key: blue: food governance factors; peach: political economy factors.

Feedback loops 3 and 4 (Figure 2):

These feedback loops suggest school meals may be an important leverage point for intervention. Children's exposure to school meals which are not nutritionally optimal establishes certain taste preferences which inform long-standing knowledge, beliefs and understanding related to food. This reduces the availability and supply of healthier and/or more sustainable foods by driving lower demand for local seasonal produce and, via guardians' (and later on, the grown-up children's purchasing decisions), lower demand for healthier and more sustainable foods. The limited availability and supply of healthier and more sustainable food further constrains the typical offer for school meals, driving quality down.

Figure 2: Feedback loops 3 and 4 – School meals as a driver of food preferences and consumer decisions



Colour key: blue: food governance factors; green: psychosocial factors; purple: supply factors; gold: intermediate outcomes.

Table A1 (appendix) presents a longer list of leverage points and potential interventions identified during the post-intervention analysis phase. These are colour coded in clusters according to the arrangement of nodes in V2 of the CLD (Figure A5). For each potential intervention, we have estimated its potential for system leverage, offered links to supportive evidence where known or available (NB – not systematically reviewed) and examples of similar interventions elsewhere, and listed likely feasibility and other considerations (e.g. practical and political).

Discussion

Summary of main findings

The Group Model Building workshop elicited a long list of distinct, but connected, variables operating within the Jersey food system. These were situated at multiple scales, from macro (e.g. demographic influences, the traded food supply), through meso-level factors (e.g. institutional food provision), to the micro level (e.g. individual access to cooking facilities, food preferences). Creating a diagram connecting these factors enabled the identification of places within the system at which to intervene in order to have the maximum impact across these levels, and across parts of the system more broadly (for example crossing governance, politics, and availability).

Focusing on key leverage points allowed development of intervention ideas to be guided by the needs of the system itself, supporting a more reflexive and context-specific way of identifying measures to facilitate change from the many possible solutions available for food systems transformation.

In addition, the leverage points and associated intervention ideas, which are spread across the system, highlight the need for approaches that intervene on multiple parts of the food system, through a range of complimentary measures (of which more below).

A qualitative approach to systems mapping was taken, prioritising the perspectives of stakeholders in Jersey's food system who participated in the Group Model Building workshop and who will apply learning from the CLD in practice (i.e. expert reference groups; the Government of Jersey Public Health Team). As such, the relative importance of different system leverage points was attributed by stakeholder interpretation rather than quantitative methods such as simulation modelling.

Considerations influencing the importance of the leverage points may therefore have included: the relevance of leverage points to focus areas for the Jersey food and nutrition strategy (e.g. 'the early years'); whether or not relevant stakeholders with influence over actions targeting the leverage point were involved in the workshop; and alignment between leverage points and evidence from the Jersey context indicating need for action. These considerations were elaborated in the prioritisation process used by the Public Health Team to identify the focus of action, in the months following the workshop.

Strengths and limitations of the methods

Systems approaches to developing policy are widely proposed, but often as a set of high-level principles which are challenging to put into practice. The method outlined above offers a practical way to operationalise a complex systems approach in food systems policymaking. In practical terms, it makes efficient use of resources by focusing efforts on changes which are likely to have most impact on the system. The method was strengthened by stakeholder engagement across food system actors, which offers additional benefits. Co-producing a system map with diverse stakeholders allows participants to see the whole system and better understand their place within it, and in turn, the need to implement a range of interventions rather than isolated measures. Discussing potential intervention ideas provides non-government actors in particular with a better understanding of the reach and limitations of government food and nutrition policy, and can help achieve consensus on where to focus scarce government resources. This adds a further level of participation beyond formal consultation approaches in policymaking, where a set of pre-decided policy proposals are presented for feedback (so-called 'constrained consultation').[64] Jersey's relatively small size enabled the assembly of a representative mix of stakeholders from across the food system in question, while remaining manageable in size in terms of plenary workshop discussions etc. Other national or local governments wishing to replicate the exercise undertaken in Jersey, in particular those of a larger size, should consider the need to balance the dual aims of system representation and workshop manageability.

A limitation of the method was the constrained timescale for the group model building. Although one day may seem like a lot of time for each stakeholder to devote to the task in the context of their everyday work, it is a very short period of time for the group to get to know each other, learn how to work together effectively and refine the outputs of their endeavours. Similarly, the amount of time for development of the CLD and for thoughtful reflection on the system representation was severely constrained, meaning that much of the detailed work had to be undertaken by the Cambridge Team subsequently, iterating with the Government of Jersey team. Although this was a highly effective relationship, a different representation of the system and its leverage points may have resulted from a longer workshop (e.g. spread over two days).

We did not systematically review evidence on the effectiveness of food policy interventions to inform the policy recommendations of each leverage point, but relied on expert knowledge. A evidence synthesis may have improved the robustness of the long list of interventions, but was beyond the scope and resource available for this work. Lastly, more detailed analysis of the data generated from the workshop may have yielded further insights but was also beyond the scope and resources available.

What the work adds to prior knowledge

The system mapping process and associated background research offers an operationalised process of system map development through to concrete policy proposals. To our knowledge this is the first time such approaches have been applied in development of a cross-cutting government-led food and nutrition policy at a national level, although regional and civic level examples exist.[65] As such it builds on the systems thinking lens which was applied to the National Food Strategy Independent Review in the UK,[25 66] by applying the principles of systems thinking and linking these directly to the development of policy proposals.

Interpretation and implications for development of the new Food and Nutrition Strategy

Systems approaches in policymaking

As noted above, Jersey is in strong position to build on the use of a systems approach that informed the UK National Food Strategy Independent Review, and to embed a 'food in all policies' approach to national-level food policy.[67] Such approaches have been pioneered primarily at the local government level to date. For example, Amsterdam's Healthy Weight Approach uses an understanding of the complex adaptive system underlying dietary behaviour in families and children to build an evolving set of interventions which target the whole system to foster healthier eating. Interventions that are supported by interdepartmental responsibility for combatting childhood overweight and obesity include a ban on marketing of unhealthy food at sports events, installation of public water fountains and establishment of the Healthy Amsterdam Business Network to develop working agreements with public and private stakeholders.[68 69] An early adopter of such approaches – since the mid-2000s – was the food policy initiative of the US state of Baltimore. It has pioneered a cross-government strategy, and developing a 'collaborative infrastructure' between government and outside stakeholders, to understand and address inequity in healthy food access in the city, through a range of actions aligned to sectoral objectives of the various departments of government.[70-72]

Owing to the complexity of the system, it is likely that interventions are most likely to be effective if they are delivered in packages and target leverage points sitting on feedback loops spanning multiple domains of the system (food availability, food accessibility, political economy, food governance, and psychosocial factors). Intervening in this way is more likely to focus efforts on the parts of the system that are more resilient to change, owing to reinforcing system processes (i.e. are unlikely to change without direct intervention). It also creates the conditions for dispersed and sustainable system changes and weakening the ability of unmodified parts of the system to mitigate or suppress the effects of

intervention. Designing food policies in packages to maximise effectiveness, enhance coherence between measures, and mitigate known barriers to improving health and sustainability, has been explored in the academic and grey literature, but yet to be documented in an empirical or evaluative study.[37 39] Sustainable system change could provide an excellent basis for further intervention to change the system at an even deeper levels, potentially using frameworks such as the Intervention Level Framework[73 74] or Action Scales Model[31] to explicitly move towards interventions targeting system goals, or even paradigm.

To ensure a coherent set of actions under the Jersey Food and Nutrition Strategy, it will be important to understand not only the coherence of new interventions with one another, but also their interaction with existing policies and other actions in the Jersey food system.[38] Any new interventions should therefore be considered within the wider policy mix already in existence, the political landscape and also in terms of what package of measures might be most effective.[37] Coherence analysis can be used to review a portfolio of interventions for tensions and synergies.[38]

System-sensitive policy processes and structures

Beyond the mix of substantive policies, which are implied by the system mapping process, are implications for the procedures of policymaking that will be required to deliver these. The process undertaken in Jersey highlights how addressing food and nutrition requires actions across the food system that stretch beyond the remit and resources of the department commissioning and developing a food and nutrition strategy. Levers to make the proposed changes are held by multiple public sector departments. Understanding how the proposed actions can meet sectoral goals of other departments will be key to attaining their involvement, and it may be useful to employ the concept of co-benefits to leverage their involvement.[75] Consideration needs to be given to how departments will be incentivised to work cross-sectorally, and how budgets can be organised to deliver a holistic approach, to avoid repeating past mistakes in developing cross-cutting national food strategies, which failed to breach policy silos in their delivery.[76-78]

Delivery will also be dependent on actions by private and third sector organisations on the Island. To elicit their actions effectively requires buy-in to the aims and priorities of the strategy, which have been somewhat addressed through the co-design workshop process itself. Part of the future strategy development process will involve identifying those areas where local commercial goals are in line with the public interest, or where profit and public health can be aligned. Experience to date suggests this is more likely to be with smaller local businesses, especially where they are cooperatively owned, function as social enterprises, or have the payment of externalities built into their businesses model (e.g. organic or regenerative farming). However, the global misalignment of commercial and policy goals, as alluded to above, may be a significant potential block to strategic progress.

Along with their buy-in, coordination of the range of actors needed to deliver a package of system-wide interventions will be required. This is unlikely to be possible without some form of mechanism to support coordination. There are a range of different tools that can be used to connect policymaking activities across the food system ranging from inside government working groups, independent stakeholder advisory bodies, to dedicated ministers and legislation, which all have different resource requirements and feasibility considerations.[79] Along with coordination, any new governance arrangements put in place to support delivery of the Food and Nutrition Strategy could also embed the participation of Jersey food system stakeholders.

Unanswered questions and future research

The CLD that has been developed is one representation of the system achieved through consensus. It could be further elaborated with further data inputs. It can also be used to inform the evaluation of interventions resulting from the food and nutrition strategy over time, including identifying intended and unintended consequences of actions taken. It could also facilitate the development of one or more simulation models (e.g. system dynamics models) to predict the likely impacts of one or more

interventions over time on health, sustainability, equity and economic outcomes, thus helping to refine policy choices. Finally, the CLD can be iterated over time to identify ways in which new policies are needed to tackle emerging challenges. The table of potential interventions (Table A5) is likely incomplete. Although a substantial task, further work is needed to develop a widely accessible repository of food system interventions, supported by evidence where available.

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You can read more about the Cambridge Team's work via the links above. You may also be interested in two research programmes that we are currently working on: Mandala and SALIENT.

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Funding and competing interests

The work reported here was supported by the Government of Jersey. RM holds shares in ZOE Limited. Other authors report no competing interests.

Acknowledgements

The authors would like to thank the participants of the workshop for their full and enthusiastic engagement on the day, as well as all those who helped with facilitation, notetaking and administration.

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Appendices

Sources of Dietary Data in Jersey

Data source	Frequency	Adult/child	Type of information collected	Inequalities data	Sampling (response rate)	Method of collection
Jersey Opinion and Lifestyle Survey (JOLS)/ Health Activity and Wellbeing Survey (HAWS) (2021)*	Annual	Adult	Height and weight	Age & sex, self-reported health	Random (28%)	Self report
Jersey Opinion and Lifestyle Survey (JOLS)/ Health Activity and Wellbeing Survey (HAWS) (2021)*	Annual	Adult	Waist measurement	None	Random (28%)	Self report
Jersey Opinion and Lifestyle Survey (JOLS)/ Health Activity and Wellbeing Survey (HAWS) (2021)*	Annual	Adult	Portions of fresh fruit and vegetables eaten in previous 24 hours (i.e. 5-a-day), 6 questions relating to importance of healthy eating and facilitators/barriers	Sex, housing tenure	Random (28%)	Self report
Living Costs and Household Income Survey	5-yearly	Adult	Household purchases	tbc	Random (tbc, in progress)	2-week self-completed spending diary, supported by interviewer
Jersey Quality Improvement Framework (JQIF)	Annual	Adult (16+)	BMI	Co-mordibities	Census of patients registered with GP	GP registers
Jersey Child Measurement Programme (JCMP)	Annual	Child (R/Y6)	BMI	Age & sex, Fee-paying/non-fee-paying school, Rurality of parish of residence	Census of children in school (96%)	School nurses
Jersey Children and Young People's Survey	Biannual	Child (Y4,6,8,10 &12)	% ate 5-a-day yesterday, awareness of importance of 5-a-day	Year group, self-esteem, lack of material goods, rurality of parish of residence, fee-paying/non-fee-paying school, ethnicity, gender	Census of children in school (96% Y6, >80% Y4, 8 &10, 72% Y12)	Online self-report
Jersey Children and Young People's Survey	Biannual	Child (Y4,6,8,10 &12)	% ate HFSS in previous 7 days	Year group, sex	Census of children in school (96% Y6, >80% Y4, 8 &10, 72% Y12)	Online self-report
*NB the less comprehensive HAWS replaced the JOLS in 2021 due to Covid						

Figure A1: Photograph of connection circles created in Yellow breakout group

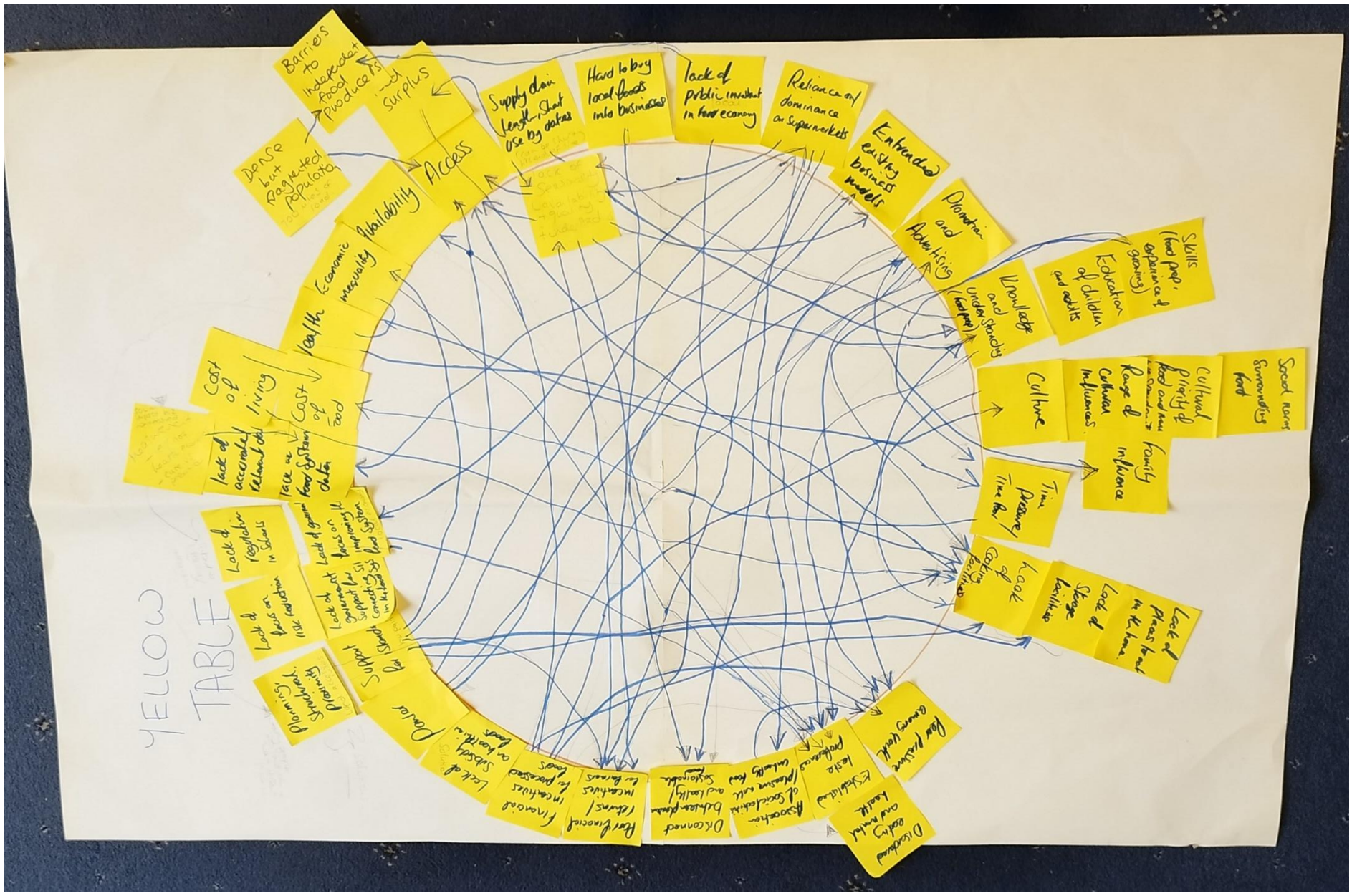

Figure A2: Photograph of connection circle created in Blue breakout group

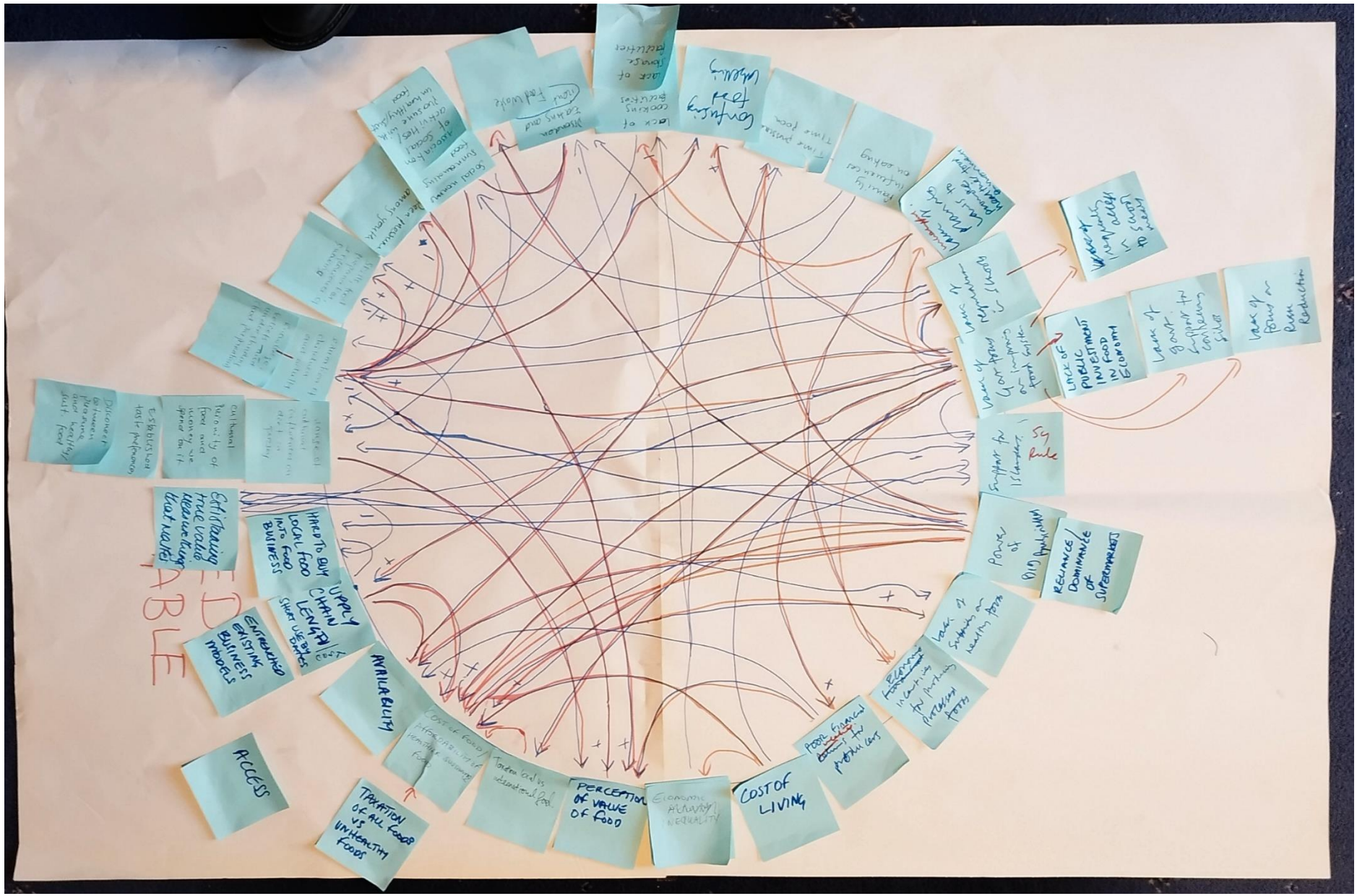

Figure A3: Photograph of connection circle created in Green breakout group

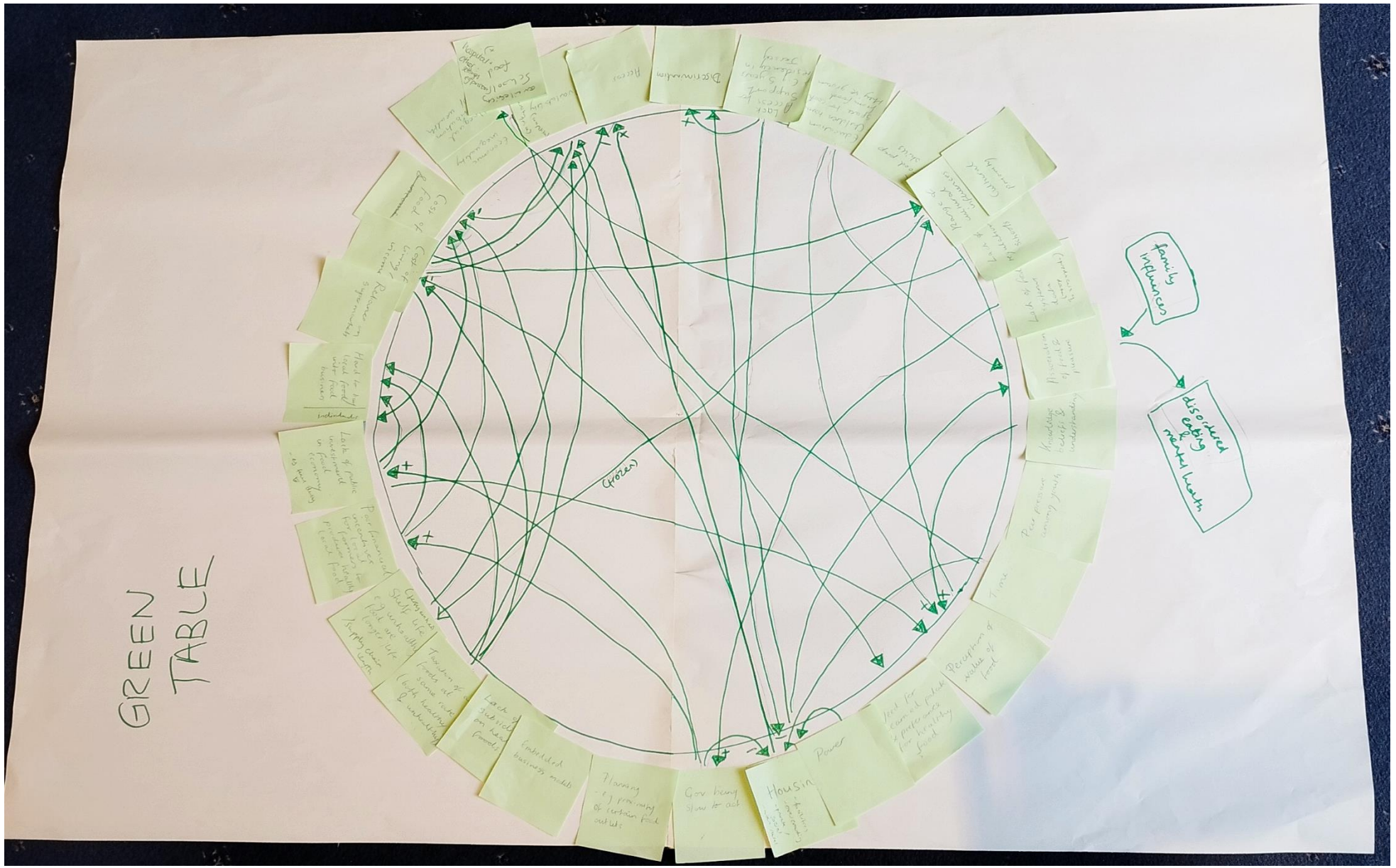

Figure A4: Initial version of Jersey food system CLD (V1) generated during group model building workshop and refined by the Cambridge Team

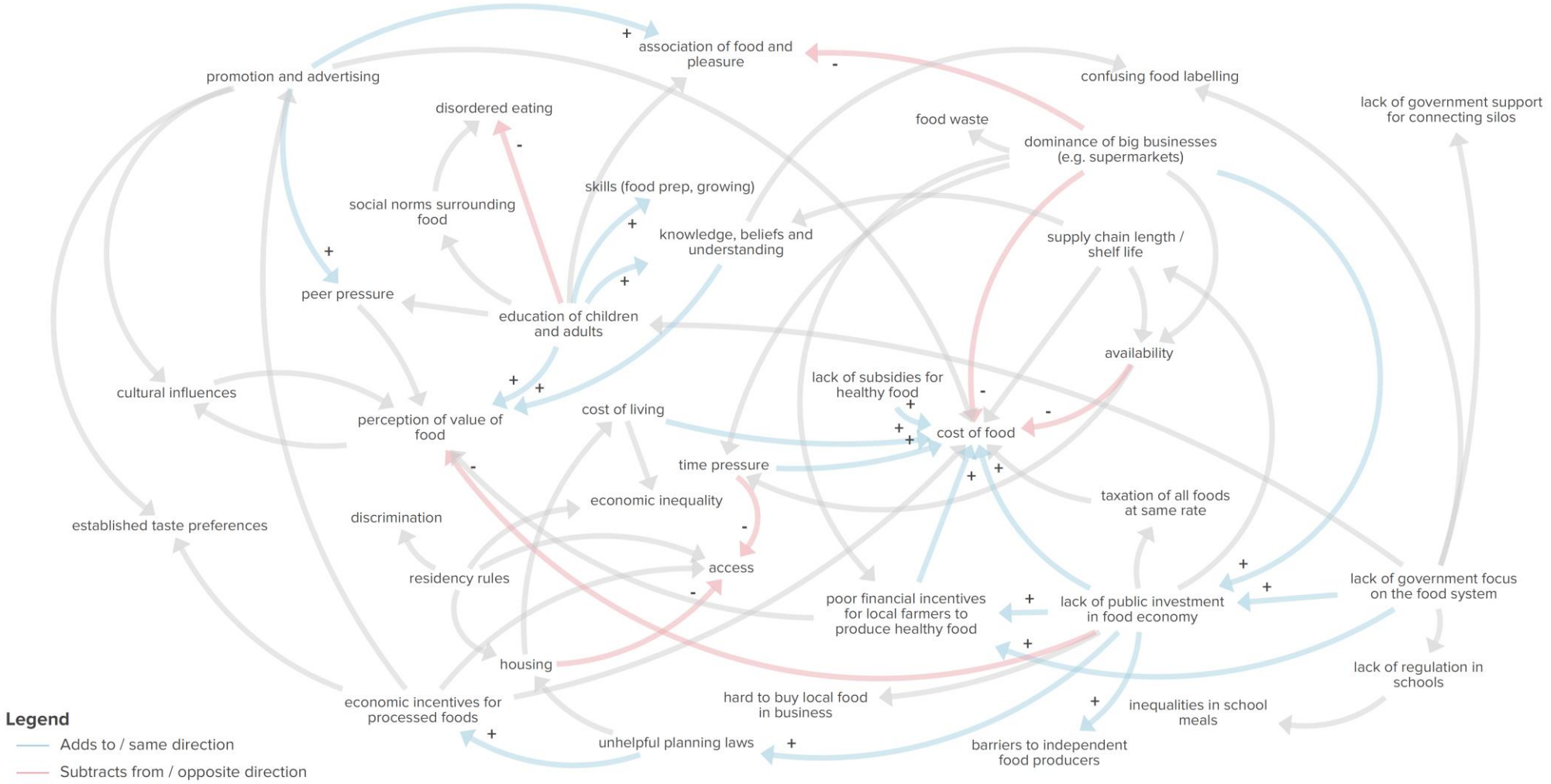

Figure A5: Version 2 of the Jersey food system Causal Loop Diagram

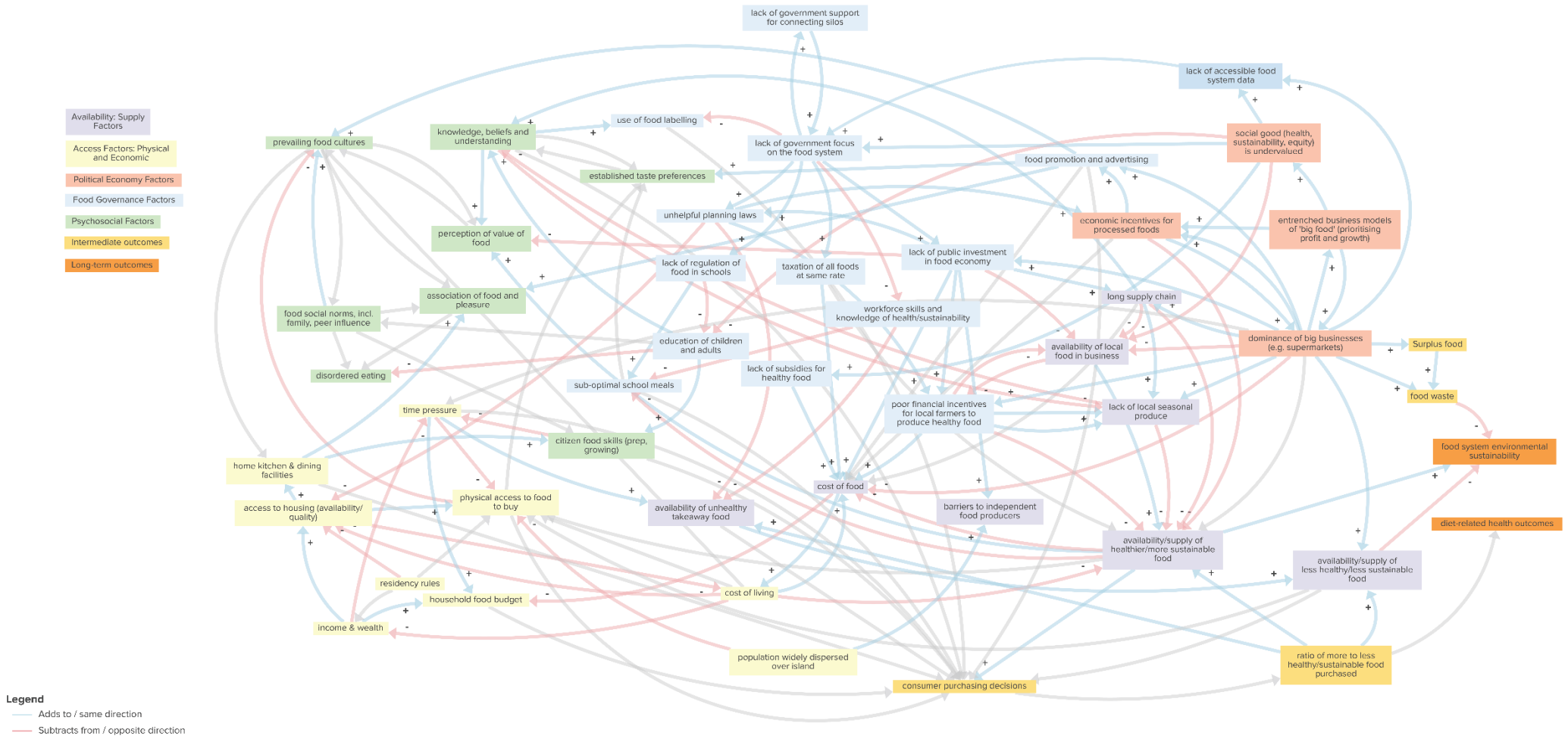

Table A1: Leverage points and potential interventions identified during post-workshop analysis

Feedback Loop, Problematic Outcome or Leverage Point	Possible interventions	Estimated potential for system leverage	Supportive evidence and examples	Feasibility and other considerations
Lack of government focus on the food system	Cross-cutting food strategy	Moderate to strong (if appropriately implemented)	Examples exist but no evaluations of effectiveness have been conducted Legislative approaches can be used to support delivery and mitigate vulnerability of strategies to political changes/cycles: Scotland has a Good Food Nation Act which requires national and local governments to produce regular food plans . Food Bill approach was recommended in National Food Strategy Independent Review (NFSIR) to enable longer-term approach to food system policymaking	Best argument is probably that Jersey has sub-optimal systems driving important externalities for health, economy, society and environment, that can only be addressed via a cross-sector strategy. Strategies require other complementary governance interventions to support delivery
	Data Curation/Monitoring Dashboard. Could include Quality Food Basket Price Monitoring. [see below on data]	Moderate to weak	Good evidence of the value of data in driving quality of health care (e.g. https://www.health.org.uk/news-and-comment/blogs/helping-the-nhs-use-data-better-to-improve-patient-care	Quality Food Basket Price Monitoring could address the potential issue of 'greedflation', as highlighted in the UK (e.g. https://foodfoundation.org.uk/sites/default/files/2023-09/TFF_PROFIT%20BRIEFING_Final.pdf)

Feedback Loop, Problematic Outcome or Leverage Point	Possible interventions	Estimated potential for system leverage	Supportive evidence and examples	Feasibility and other considerations
	Policy coherence tools – to assess food policies against food system goals. Could include aligning food policies with dietary guidelines/reference diet	Moderate	Coherence assessment is embedded in Sustainable Development Goals and progress monitoring, but evidence of application in food policymaking is limited. Some evidence of limited impact of Health in all Policies framework Reference tool for policy coherence was proposed in the NFSIR UN Food & Agriculture Organisation has proposed improving food system policy coherence using more systemic dietary guidelines	Requires a commitment to act on incoherence rather than simply identify it. Tool could be applied to existing policy landscape (requiring a policy audit) and for ex ante assessment of new policies/interventions.
	Further system mapping and group model building, or knowledge exchange on existing with government	Unclear	Some evidence on the value of group model building in food system governance (e.g. https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2023.1103834/full)	Could provide GoJ understanding of rationale for joined-up approach. Health minister could be a useful advocate. Not sure that further mapping would be needed, but would be interesting to know the extent to which this has acted as a stimulus. Mapping of policy responsibilities and activities across food system could underpin strategy and support cross-government delivery

Feedback Loop, Problematic Outcome or Leverage Point	Possible interventions	Estimated potential for system leverage	Supportive evidence and examples	Feasibility and other considerations
	Government body for food/systems with ministerial leadership	Moderate to strong	Examples exist but no evaluations of effectiveness have been conducted on food-specific bodies Scotland has introduced a non-governmental independent Scottish Food Commission to provide oversight of its Good Food Nation policy Expansion of Food Standards Agency remit to cover healthy and sustainable food recommended in NFSIR (as an alternative to creating a new body)	There are pros and cons of internal government vs external bodies. If internal, needs to be considered at highest levels of power e.g. make it ministerial. If external needs oversight role combined with sanctions for non-delivery (e.g. lessons from UK Climate Change Committee). Potential to focus on coordination across government and/or inclusivity/participation of stakeholders (both were embedded in Brazilian food bodies). This links to strategy – if it can be achieved, then evidence suggests it may be best not to make it one department's responsibility but try to make it central (though this challenging to do on long-term basis/post-strategy development)
	Dedicated resources - staff, budgets –for food system action	Unclear	Examples of dedicated staff exist at national and local government levels, but no evidence of effectiveness available. Some evidence from local level that a dedicated team enables embedding of food across departments/policies No identified examples for shared budgets exist in cross-cutting food policymaking, but this mechanism has been proposed in climate field to support cross-government working on interventions with benefits for multiple sectors (e.g. climate and health)	Part of the strategy – a Cabinet level/treasury decision. Possible to develop a 'food systems fund' with contributions from multiple departments Such teams have proved fragile and subject to political and project cycles

Feedback Loop, Problematic Outcome or Leverage Point	Possible interventions	Estimated potential for system leverage	Supportive evidence and examples	Feasibility and other considerations
	Learning exchange with other countries, or cities	Unclear	Learning exchange less developed at national level, but strong emphasis at local government level, e.g. Milan Urban Food Policy Pact City network, C40 cities	Need to consider which would be viable comparators. Guernsey for sure. Other small island states?
Lack of accessible food systems data	Improved data collection and monitoring, including reporting of food companies	Moderate	Examples exist but no evaluation of effectiveness identified. Mandatory reporting on sale of products and food waste, and National Food System Data Programme recommended in NFSIR and in House of Lords Committee on Food Diet and Obesity Food Data Transparency Partnership being implemented by UK Government Food Systems Dashboard is a global level example of a food systems data dashboard which can inform policymaking	Need to identify what is currently being generated. What is the data problem? How might it drive GoJ policy? (e.g. extent big businesses are selling junk food, Kantar or Nielsen data for the Island, which could provide basis for policy actions to reduce). Also, what data could be available from large companies (e.g. supermarket with leading market share on Jersey). And what data does GoJ have on imports/exports, land use, planning, retail etc.
Food Labelling	Grocery retail labels	Moderate to weak	Unclear what best option is – Latin American countries making claims about black front of pack warning labels and efficacy. Not clear if culturally acceptable in other countries such as Jersey (e.g. https://data.europa.eu/doi/10.2760/932354)	FOPL in Jersey reflect schemes in UK. Would be challenging to get consistent/mandatory approach in Jersey given UK/Global companies supplying. Would increase costs for companies of repackaging – but worth considering. It would say to companies – if you want to do business here, these are our conditions. An unintended consequence could be a reduction of products on sale from multinationals, unless food labels align with label used to in other, larger markets.

Feedback Loop, Problematic Outcome or Leverage Point	Possible interventions	Estimated potential for system leverage	Supportive evidence and examples	Feasibility and other considerations
	Out of home menu labelling	Unclear	Operates via 2 modes of action – informing public (weak evidence) and incentivising reformulation (moderate evidence) Good learning from recent NIHR evaluation	Area in need of further systematic evidence synthesis
School meals	School food standards	Moderate	See: early evaluation of school food standards	Jersey School Food Standards currently in place for primary schools. Menu planning by school food caterer in partnership with public health dietician.
	Tap water only in schools policy	Moderate to weak	Trialled in London, by London Obesity Taskforce Evidence from Austria shows increased consumption of tap water	Straightforward in principle, may be some practical barriers to overcome. Important not to replace bottled soft drinks with bottled water.
	Universal free school meals	Moderate	Evaluation evidence suggests positive impacts, e.g. London Borough of Newham UIFSM Evaluation UK Government Evaluation of Free School Meals Pilot Cost-Benefit-Analysis of FSM Expansion	FSM not universal in Jersey but there is a universal subsidy to reduce cost to families to £2.50/child. Eligibility for FSM determined by household Income Support, with additional discretion for headteacher to prioritise other families. In place in primary schools. Being extended to secondary schools.

Feedback Loop, Problematic Outcome or Leverage Point	Possible interventions	Estimated potential for system leverage	Supportive evidence and examples	Feasibility and other considerations
	Direct provision of (non-lunch) healthy foods including breakfast clubs, school fruit and veg, milk	Moderate to weak	UK School F&V Scheme Evaluation Review and meta-analysis from 2021 suggested positive effect of free or parent-subsidised distribution of F&V snack on children's F&V consumption Doubling of school F&V Scheme provision, and changes to administration, linking to local supply, recommended in NFSIR	School fruit pilot underway in Jersey. Breakfast clubs (paid for by family) provided for children requiring pre-school childcare. Some schools supported to make switches to healthier breakfast options. Possibility of local sourcing being explored.
	Training of catering staff	Moderate	Some anecdotal evidence from schools in UK Training recognised as important enabler of healthy sustainable food procurement policy success in Denmark	Could enhance quality of FSM – especially if scaled up
	Dedicated advisory and knowledge sharing network	Weak	Evidence exists on School Food Trust example in UK	Requires assessment of current approach and how could be implemented
	Create healthy sustainable-focused catering company (could be local authority-owned, or schools-owned)	Moderate	Evidence of existing examples in UK: Local Authority-owned – Newham, London School-owned	Important link to economic strategy – government subsidy to kick start might be game changer

Feedback Loop, Problematic Outcome or Leverage Point	Possible interventions	Estimated potential for system leverage	Supportive evidence and examples	Feasibility and other considerations
	Government or individual institution food procurement policy	Moderate	Evidence of positive impacts from Copenhagen Food Procurement Policy and Brazilian policy among others Improving and mandating Government Buying Standards for Food, and making accreditation schemes mandatory recommended in NFSIR https://www.gov.uk/government/publications/sustainable-procurement-the-gbs-for-food-and-catering-services	Could cover schools, and other institutions. Could be bespoke or off-the-shelf framework, e.g. Food for Life Served Here Standards.
	Whole school food approach	Moderate to strong	Recommended in NFSIR, including linking to existing accreditation schemes e.g. Food for Life. Food for Life Evaluations Sensory Education recommended in the NFSIR. Taste Education UK Example; Evidence from Nordics Food Dudes Evaluation	Food Dudes programme operating in select Jersey Schools. Needs investigating and an approach recommending. Would provide a valuable context/package for the above interventions
	School food awards or rating Scheme	Weak	Example from Netherlands (needs further review of effectiveness)	Would present implementation and enforcement challenges
	Food Education, in school curriculum	Unclear	Evidence of multiple examples, but evidence on impacts unclear. Changes to food education recommended in NFSIR	Need to see what there is presently. Undoubtedly having some focus on food from the earliest age would help. Links to the Jersey Food Campaign idea, and part of a whole school approach.

Feedback Loop, Problematic Outcome or Leverage Point	Possible interventions	Estimated potential for system leverage	Supportive evidence and examples	Feasibility and other considerations
Entrenched business models	Investor action	Unclear	Some evidence that investor action has resulted in small changes, but approach is in its infancy (https://www.sciencedirect.com/science/article/abs/pii/S0306919224000319). Concerns that investor action leads to disingenuous actions by companies (e.g. corporate social responsibility claims) Example of Share Action campaign on food in UK	Requires alternative (e.g. triple bottom line) business models. Potentially beyond Jersey control: big players are transnational corporations. But Jersey is a hub for the finance industry, so there may be local interest. Jersey businesses could potentially be influenced by GoJ.
	Development of alternative businesses (with more ethical balance of priorities)	Unclear	Theoretically important, but strength unknown. Enhancing demand for healthier and more sustainable food will be needed if regulatory and fiscal measures are used to down-regulate unhealthy and unsustainable elements of the food system There are a few larger-scale examples of disruptors (e.g. LEON the healthier takeaway food chain in out of home sector, Riverford in the farming/retail sector), and many smaller examples of ethical retailers and manufacturers	Unknown. Would require concerted effort by GoJ, perhaps via Chamber of Commerce or similar, to market the proposition, and then explore ways to implement (e.g. seed funding for new enterprises meeting key criteria)
	Tariffs on importing supermarkets Could be the proposed food tax regime above – or a separate import tariff on unhealthy/less sustainable foods.	Strong	Examples of import tariffs include islands of Fiji, Samoa, Tonga, but evidence of effectiveness unclear	Precedent in place with regulation on selling only Jersey-produced milk. Will require GoJ discussion on the range of taxation-related options.

Feedback Loop, Problematic Outcome or Leverage Point	Possible interventions	Estimated potential for system leverage	Supportive evidence and examples	Feasibility and other considerations
	Subsidies to Jersey food business– either in combination with taxes or as a stand-alone measure	Strong	Strong evidence from modelling studies and trials in retail settings; healthy food subsidies already used in various countries (e.g. https://doi.org/10.1016/S2468-2667(20)30116-X)	Could be linked to subsidies for local production, incentivising diversification of local agriculture and horticulture, boosting the local economy GoJ now subsidises local ecologically sustainable agriculture via a 3-tier system, using pre-established quality standards, from Red Tractor etc through to Organic/LEAF. An equivalent subsidy to catering (using e.g. Soil Association Food for Life and retail (no known existing standards) could be powerful.
	Increased wholesale (non-supermarket supply chain; to provide an alternative to reliance on supermarket importing)	Unclear	Unclear	Requires analysis of scale of imports of different foodstuffs to get clear picture of current system.
	Business Rates: Incentive for companies selling healthy/sustainable food, e.g. lower interest rate if they achieve a year-on-year improvement in environmental, social and corporate governance (ESG) targets	Moderate to weak	No identified evidence of usage for targeting health and sustainability, mainly used for encouraging new enterprises. Newham and Bristol Councils are said to be exploring	Could apply just to businesses registered in Jersey to foster local food system.

Feedback Loop, Problematic Outcome or Leverage Point	Possible interventions	Estimated potential for system leverage	Supportive evidence and examples	Feasibility and other considerations
Cost of food	Taxation (import or other food tax increase or waiver)	Strong	Tiered Sugar and Salt Reformulation Tax was recommended in NFSIR Some evidence of impact on level of imports (but impacts on consumption unclear) - import tariff waiver on fruit and veg policy. See example from Fiji	Treasury will likely be most attracted by (a) possibility of revenue raising, (b) tax regime that is simple to implement, (c) avoiding taxes on people (as opposed to businesses), (d) avoiding taxes on Jersey businesses. This suggests something like the tiered Sugar and Salt tax proposed in the NFS Plan – has added advantage that relevant modelling has already been done by Institute for Fiscal Studies. (largely tax on importers, given the nature of the food supply in Jersey). See also import tariffs below.
Taxation of healthy foods at same rate as unhealthy foods	Tax on unhealthy foods [see above]	Strong	See below	See below
Household Food Budget	Regulation to ban price promotions (which lead to increased spending on unhealthy foods)	Moderate to strong	Regulation already planned but delayed in England. Sainsbury's and Tesco independently removed price promotions already and discount supermarkets have never used them	Learning will be available from UK experience - implementation expected in 2025.
	Increased offers on healthier and more sustainable food	Unclear	Widely used to shift surpluses of fresh produce by UK supermarkets already. Some examples of everyday discounts on fresh produce Some evidence of positive impact in UK supermarket trial	Need to consider who would fund, and the economics more broadly need thinking through

Feedback Loop, Problematic Outcome or Leverage Point	Possible interventions	Estimated potential for system leverage	Supportive evidence and examples	Feasibility and other considerations
	Regulation to ban advertising of unhealthy food	Strong	Evidence of positive impacts on encouraging the purchase and consumption of unhealthy food and drink (without negatively impacting revenues) from TFL Ad Ban Evaluation 9PM watershed regulations already proposed for UK and will be implemented by October 2025	Potential to be the most powerful industry regulation in the world – could Jersey be the first to implement? The problem would be that Jersey media mostly comes from external sources (e.g. UK) – but it could be made to work. Much stronger would be a complete ban on HFSS food and brand advertising.
	Improved food provision targeting food insecurity, via measures such as: • Food banks • Other community food provision • Welfare support • Food vouchers (Healthy Start; Alexandra Rose) • Social prescribing. • Connecting local producers/growers/ allotments with food relief projects to increase access to fresh surplus food.	Moderate. Universal schemes (such as FSM) have wider benefits	Numerous examples but evidence of effectiveness not well established Some evidence on food vouchers. Increased funding and roll out of Healthy Start recommended in NFSIR Example of linking food vouchers to local supply – evaluation of NYC health bucks Social Prescribing recommended in the NFSIR. More evidence of effectiveness required: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7675025/	Healthy Start food vouchers for pregnant women and families with children aged 0-4 who are in receipt of Income Support, with planned expansion to reception age. No food on prescription scheme. Social prescribing on Island very limited. 3 food banks on Island (working independently). Grow is a community project that uses food to address multiple social issues. Potential for a surplus food network linked to the Dynamic procurement (See Table 2– could utilise the same logistics).
	Free school food provision (meals, breakfast club, holiday activities & food schemes)	Moderate	Evaluation of HAF Programme by UK Government suggests positive impacts	Currently school meals in a small number of Jersey schools based on a pilot scheme run by a charity? Some free breakfast clubs operating – led by schools individually. Needs reviewing carefully – and a case made for universal provision, as well as economic assessment (see above)

Feedback Loop, Problematic Outcome or Leverage Point	Possible interventions	Estimated potential for system leverage	Supportive evidence and examples	Feasibility and other considerations
	More affordable food provision models (Cooperatives, Social Supermarkets)	Moderate	Some examples, such as Northern Ireland pilot of social supermarkets and Company Shops, Wales Community Food Cooperative Programme, food coops project in England. Evidence of impacts unclear	Opportunity to target multiple leverage points (food budget; barriers to local food; viability of livelihoods in food system)
Insufficient income	Welfare reforms. Not addressed due to feasibility barrier	N/A	Strong evidence for the association between access to resources and dietary quality, access to healthy foods etc	Higher-level economic lever, within GoJ control, but challenging to justify on grounds of improving diets (a hard sell to the politicians and media), but sensible from social policy point of view
Prioritise social good – health, sustainability and equity undervalued in food system	Campaign Intervention [see above]	Unclear	Theoretically important, but untested	Requires analysis of externalities as they apply to Jersey. Could undertake a conversation with Jersey businesses on their views on social good, are they interested? Could be used to justify actions, including taxation on imports
Unavailable or unsuitable housing	Housing policy reform.	N/A	Strong evidence for the association between quality of housing and health outcomes. (https://onlinelibrary.wiley.com/doi/pdf/10.4073/csr.2013.2) some evidence on the importance of access to domestic kitchen equipment (https://onlinelibrary.wiley.com/doi/pdfdirect/10.1111/jhn.12615)	Not addressed due to feasibility barrier. Higher-level economic lever, beyond Public Health control. Challenging to justify on grounds of improving diets (a hard sell to the politicians and media), but sensible from social policy point of view
Availability of unhealthy takeaway food	Aggregator technology measures to change algorithms in favour of promoting healthier and more sustainable options	Moderate	Some evidence of potential (https://www.scienceopen.com/hosted-document?doi=10.14236/ewic/HCI2021.16)	Would be undermined if voluntary-only measure. Likely to need regulatory measure. Some independent Jersey aggregators exist, plus Deliveroo, Just Eat, UberEats (as listed by KFC).

Feedback Loop, Problematic Outcome or Leverage Point	Possible interventions	Estimated potential for system leverage	Supportive evidence and examples	Feasibility and other considerations
	Regulation of portion sizes	Moderate	No evidence of an effective regulatory measure. Some choice architecture experiments involving caterers voluntarily reducing sizes	Need to think about what an intervention might look like (e.g. could GoJ set a calorie limit on single person portions of food, such as for a main meal, for a snack etc.)
	Regulation of healthiness of foods for sale (e.g. using an NPM)	Moderate	No regulatory evidence. Use of mandatory calorie labelling and voluntary front of pack labelling suggest small effects on reformulation and minimal effects on purchasing. Mandatory reporting has been proposed in the UK (in NFSIR and House of Lords Committee on Food, Diet and Obesity)	Any regulatory measure likely to result in reformulation, which does not reduce consumption of processed foods.
	Menu labelling (calories, or nutrition facts)	Moderate to weak	UK evidence for mandatory calorie labelling (see above) – main effect on reformulation rather than consumer choice.	Useful as part of a package of measures. Multiple implementation and enforcement challenges.
	Planning policy restrictions (can target (1) new openings; (2) opening hours)	Moderate to weak	Some evidence of positive impacts of planning policy restrictions in UK	Work needed to investigate Jersey planning laws and how they incentivise businesses (start-ups, big food business e.g. McDonalds). Mapping them out would help, plus exploring available data.
	Regulations on food vending machines	Weak	Some evidence on positive impacts of healthy vending from UKand in USA	Need to prioritise vending targeting children, e.g. in schools, leisure centres etc.
	Ban on the sale of energy drinks to minors	Weak	Included in list of UK regulatory measures developed (but not yet implemented)	Would present implementation and enforcement challenges

Feedback Loop, Problematic Outcome or Leverage Point	Possible interventions	Estimated potential for system leverage	Supportive evidence and examples	Feasibility and other considerations
	Standards/award schemes	Weak	Evidence that these have helped with hygiene standards ('scores on the doors')(https://www.food.gov.uk/research/impacts-of-the-scheme), but not aware they have been properly developed or evaluated for health/sustainability (needs review). Mixed evidence on impacts from examples of Healthy Catering Commitment and Bristol Eating Better Award	Significant implementation costs (e.g. inspections/accreditation)
	Training of Staff. Examples include 'Takeaway masterclass'; training linked to healthy catering commitment standards/award	Weak	Limited evidence from pilot	Might make sense as part of a wider package – but needs properly developing and evaluating.
Lack of seasonal supply	Diversification of food production (beyond potatoes and milk)	Moderate	Unclear. Some evidence from Finland of strategy to switch production focus to healthy crops.	Demands an analysis of current land use, productivity per hectare, the nature of produce, its market value etc. Modelling could then be undertaken to explore the economic and environmental impact of changes in the proportions of different produce. This could then make the case. Climate advantages could be leveraged, longer growing season, undercutting air freighted asparagus, beans etc
Physical access to food-availability	Increase or improve delivery services (electric vehicles)	Moderate	Unclear	Need to identify current delivery capability. Do supermarkets in Jersey deliver? NB. some supermarkets seem to use Deliveroo. Morrisons did delivery during Covid.

Feedback Loop, Problematic Outcome or Leverage Point	Possible interventions	Estimated potential for system leverage	Supportive evidence and examples	Feasibility and other considerations
	Food logistics hub to distribute local and imported food to local businesses (B2B), which also serves business to consumer (B2C)	Moderate to strong	Roll out of dynamic procurement recommended in NFSIR Some evidence from examples of UK and US food hubs	As a Jersey-wide dynamic procurement model for B2B this seems to make sense and appealed to workshop participants. Could improve efficiency and add value to local economy, as well as have sustainability benefits- also links to Jersey food campaign
	Increased or diversified direct sales and short supply chains e.g. veg boxes, CSAs	Moderate	Some evidence on existing short supply chain initiatives and their positive impacts	Need to identify local supply available. Is it possible to possible to import wholesale? [see above] Need around increased access/more diverse offer. Participants mentioned membership at SCOOP for organic produce and Hedge Veg (side-of-the-road farm shop stalls)
	Increase or improve local food markets	Moderate	Unclear	Could there be a B2C component of the above? Is there sufficient demand? Could this be created through a Jersey food campaign?
Availability of nutritionally adequate food	Food fortification by regulation	Strong	Good evidence for: Folic acid supplementation (e.g. in flour) and Fluoridation of water supplies Water fluoridation patchy in UK, but less effective/necessary with effective use of fluoridated toothpaste Folic acid fortification proposed but not yet implemented in UK	Needs assessment of tap water fluoride levels in Jersey to assess need and cost-benefit ratio of implementation. If folic acid fortification of flour introduced in UK, Jersey might benefit. Otherwise, could regulate independently.

Feedback Loop, Problematic Outcome or Leverage Point	Possible interventions	Estimated potential for system leverage	Supportive evidence and examples	Feasibility and other considerations
Barriers to local healthier and more sustainable food	Support for local, healthier, sustainable food supply (various) Could involve a number of different measures: Incubator programmes for new food enterprises. Support for establishment/ expansion of producer cooperatives Support new food enterprises - retail, food carts, mobile stall, in underserved areas Improving agricultural extension/advisory services to focus on sustainable food, diversity/heritage crops Redirecting agricultural subsidies/strategy away from monoculture/dairy towards nutritious crops, grown sustainably Land Use Mapping and Plan Development of economic and tourism policies supporting a sustainable food economy. NB need to consider through the lens of a seasonal tourist trade]	Moderate	Some existing examples such as fostering food coops in Italy; mobile carts fresh food bus; sustainable food tourism policy being pursued by Nordic region Various related recommendations in NFSIR including: Innovation strategy and fund Improved subsidies linked to environmental outcomes Land Use Framework (currently being developed by UK government	Requires analysis of current barriers. Analysis can be used to inform a potential intervention on local dynamic procurement/supply system.

Feedback Loop, Problematic Outcome or Leverage Point	Possible interventions	Estimated potential for system leverage	Supportive evidence and examples	Feasibility and other considerations
Unhealthy or unsustainable consumer purchasing decisions	Nudging (e.g. choice architecture interventions in retail outlets (micro-food-environments))	Weak to modest	There is a huge literature on choice architecture interventions in food service and grocery retailing	Industry may favour these approaches, as they represent weaker levers. If this kind of lever is what is considered most politically viable, it should not be dismissed on weakness grounds, but needs to be thought about carefully. Replicating UK proposed policies on calorie labelling, minimum unit pricing, price and location promotions in retailing would be possible, but their potential should be analysed carefully.

Feedback Loop, Problematic Outcome or Leverage Point	Possible interventions	Estimated potential for system leverage	Supportive evidence and examples	Feasibility and other considerations
	Information or communication campaigns (e.g. Jersey as a 'healthy island') Could include: - Food events, celebration days (e.g. Nordic 'restaurant day') - Chef-led public information campaigns - Local food culture strategy (see Nordic example) - Create food-focused planting of public areas to celebrate food via growing (Incredible Edible Todmorden approach)	Weak (but could help support other structural measures)	Generally weak evidence for public health campaigns, but commercial marketing campaigns can have important impacts. Examples: - Sugar Smart Evaluation - Veg Power Eat Them to Defeat Them Campaign Evaluation - Example of Chef-led Campaign - Chef's Manifesto - Example of Food Culture Strategy: New Nordic Food Manifesto - Food Planting Campaign example: Incredible Edible Todmorden	Nature of the 'campaign' needs thinking through carefully. A campaign that is aimed at building a sense of excitement and pride (and taking control) about Jersey food might work, given keen stakeholder interest in Jersey as a local food system. Needs market research to develop. Campaigns need to be professionally developed and tested (e.g. by an advertising agency with experience of social marketing). This has cost implications. Jersey is a relatively small and closed population, so targeting may be easier than in a larger state. Requires cross-cutting approach where food is prioritised in other strategies including tourism, planning, and clear commitment from food businesses to align their offer.
	Minimum unit pricing for alcohol	Strong	Introduced in Scotland, with promising results published June 2023	Need to identify evidence on calorie contribution of alcohol to diet.
	Warning labels at the point of sale (e.g. 'high caffeine content, not recommended for pregnant women' for energy drinks)	Weak	Some evidence for impacts of Front of Pack Warning Labels from Chile, Mexico etc.- see above	Most drinks imported, so same challenges as food labelling [see above].

Feedback Loop, Problematic Outcome or Leverage Point	Possible interventions	Estimated potential for system leverage	Supportive evidence and examples	Feasibility and other considerations
	Regulation to ban advertising of unhealthy food	Strong	TFL Ad Ban Evaluation 9PM watershed regulations already proposed for UK and will be implemented by October 2025	This has the potential to be the most powerful industry regulation in the world – could Jersey be the first to implement? The problem would be that Jersey media mostly comes from external sources (e.g. UK) – but it could be made to work. Much stronger would be a complete ban on HFSS food and brand advertising.
Food Waste	Various food waste interventions could include improving food waste collection (business, consumer); ban on sending supermarket waste to landfill	Moderate (for sustainability)	Some evidence on potential of interventions. See also WRAP	Requires analysis of where waste is currently generated, hotspots, and how it is dealt with, including current infrastructure.
Knowledge, Beliefs, Understanding	Jersey Food Campaign [See above]	See above	See above	See above
	New dietary guidelines, with progressive approach covering sustainability and eating practices/UPF [Also a governance/policy coherence intervention – see above]	Moderate to weak	Evidence of national dietary guidance in Canada, Brazil and some other countries which include processed foods	This could be a central plank driving a range of policies, but should not be invoked as a way of delaying everything (industry will say this). Could also link to a NPM, which would help, and help drive the 'campaign'.
	Dietary advice to women in pre-conception, pregnancy	Moderate	Current gaps in advice have been identified in the UK. Evidence likely to be poor/equivocal	Could utilise existing interfaces such as midwife/health visitor, food banks.

Feedback Loop, Problematic Outcome or Leverage Point	Possible interventions	Estimated potential for system leverage	Supportive evidence and examples	Feasibility and other considerations
Citizen food skills – preparation and growing	Cooking classes – linked to range of measures which can be used to increase public knowledge of food including support for food-growing/initiatives (access to land, resources, training etc). See also food campaign above	Weak	Evidence that eating home prepared food is healthier https://ijbnpa.biomedcentral.com/articles/10.1186/s12966-017-0567-y On cooking classes - Intervention evidence is poor: https://www.sciencedirect.com/science/article/pii/S0195666316309576 Food Growing – lessons from London's Capital Growth campaign	Could be beneficial if targeting certain vulnerable groups e.g. widowed men. Could involve local chefs, e.g. Chefs in Schools (see above on school food).
	Provision of Cooking Equipment/Slow Cookers	Unclear	Theoretically important where absolute need, no evidence of effectiveness identified	Requires needs assessment. Govt subsidised, or Charity/NGO provision?
	Subsidised Community Restaurants	Unclear	Some evaluation evidence evaluation from Brazil Proposal has been made to introduce in UK	Requires needs assessment
	Community Kitchens	Unclear	Some evidence (quite old) of positive impacts	Requires needs assessment
Perception of value of food	Campaign Intervention [see above]	See above	See above	See above

Box A1: Actions listed in the Jersey Food & Nutrition Strategy (2017-2022)

Healthy eating policies and standards, and requisite training, in early years care settings

Development and implementation of an evidence-based whole school nutrition programme

The development and promotion of consistent dietary messages based on agreed nutritional targets within the workplace and social media

Expanded support for breastfeeding policies

Roll out and monitoring of Jersey School Food Standards across secondary schools, and support expansion of standards to include early years settings

Increased access to breakfast clubs

Further development of healthy eating policies and healthy procurement policies across States of Jersey departments, in line with Health Promoting Hospitals and Government Buying Standards for Food and Catering Services

Fiscal measures to improve access to a healthy balanced diet for key target groups, such as free school meals and co-operative food banks

Targeted subsidies to influence affordability and access to fruits and vegetables, particularly for key target groups, along with taxes to discourage the consumption of food and beverage products high in fat, sugar and salt.

Planning measures to limit and regulate placement of fast food outlets, particularly with regard to proximity to schools, and to ensure minimum standards for cooking and food storage in housing accommodation.

Development and adoption of food and nutrition standards for care homes and residential facilities, as part of the registration and inspection process.

Retailer promotion of healthier choices and consumer-friendly nutrition labels,

Hospitality and catering industry reformulation of menus

Introduction of a healthy catering award scheme to encourage the adoption of healthier cooking techniques, use of healthier ingredients, nutrient profiling and provision and identification of healthier options for consumers.

Consideration of the nutritional content of products and encouraging reformulation

Development of legislation to ensure Environmental Health have power and capacity to enforce appropriate food hygiene standards and labelling requirements in catering

Training for health and education practitioners to make the most of brief intervention and nutrition counselling opportunities i.e. primary care settings, health visitors, teaching staff and child care workers.

Increased provision of training in nutrition as well as food hygiene, for the catering industry

Community-based training in nutrition and cooking skills for targeted groups, such as new mothers, young adults leaving care, older men, carers and low-income groups.