Application of Theories of The Policy Process In Sustainable Diet Research: A Systematic Review

Celia Green (✉ celia.green@unsw.edu.au)

University of New South Wales

Gemma Carey

University of New South Wales

Andrew Joyce

Swinburne University of Technology

Research Article

Keywords: Sustainable diets, policy, policy process, policy theory

Posted Date: January 19th, 2022

DOI: <https://doi.org/10.21203/rs.3.rs-1179485/v1>

License: This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Background: Application of theories of the policy process are needed to help explain the dynamics of policy status and change.

Methods: A systematic review of application of theories of the policy process to sustainable diet research was conducted.

Results: The review identified that 296 papers presented ideas for sustainable diet policy but only 17 provided coverage of the process by which such policies could become enacted. The majority of papers in the field of sustainable diets were diet modelling studies which used quantitative methods to analyse the metrics of different diets. Many of these papers also included policy recommendations but these were made without any insights into the policy process. Studies which did include policy discussion were largely focused on the evaluation of past policies or analysis of potential policy options rather than focused on the policy process itself. Seventeen papers included discussion of some key influences on policy making that are routinely included as elements within theories of the policy process but did not specifically name or utilise a political science theory of the policy process. Most notably these elements were the influence of coalitions/networks, evidence use, narratives and framing, institutional and political system factors, and the importance of value and belief systems and socio-cultural norms.

Conclusions: There is a significant research gap in the application of political science theories of the policy process to sustainable diet research. Given the lack of policy action in the area on a global scale there is an urgent need for more research applying robust policy process theories to help understand and explain the lack of action and suggest possible ways to increase attention and action on the issue from decision makers.

1. Introduction

Climate change is now recognised as the most significant global public health

issue of the 21st century (IPCC, 2014) and addressing it is considered one of the most important contributions to human health world-wide (Wang & Horton, 2015). Globally the food production system contributes to around 30% of climate changing global greenhouse gas (GHG) emissions and is one of the leading drivers of deforestation, loss of biodiversity, and water use (Garnett, 2013; Vermeulen et al., 2012). As a means of mitigating GHG emissions from the food system and achieving food security, policy makers, influential stakeholders, and the food industry have emphasised the importance of 'sustainable intensification' via technological advances in agricultural production (Smith et al., 2007). However a growing body of research suggests that technological innovations alone will not be sufficient to achieve significant reductions in food-related GHG emissions or to curb environmental degradation, and changes in consumer behaviour toward more sustainable food consumption are also necessary (Audsley et al., 2010; Garnett, 2011; Weber & Matthews, 2008). Within this context, nutrition and diet are key determinants

for maintaining health and prevention of non-communicable disease while also mitigating climate change (WHO/FAO, 2003).

The Rockefeller Foundation-Lancet Commission on Planetary Health proposed that dietary changes have significant potential to reduce environmental impacts of food production as well as improve health (Whitmee et al., 2015). More recently an EAT-Lancet Commission into healthy diets from sustainable food systems (Willett et al., 2019) concluded that “the food we eat and how we produce it will determine the health of people and the planet” (p.484) but major changes are needed to achieve sustainable food systems. This includes multi-level, multi-sector, multi-disciplinary and multi-actor changes and thus these changes face significant governance issues.

Unfortunately, despite the urgent need for these changes there has been very little, if any, uptake of policy actions by governments world-wide to meaningfully address the issue.

Given the large body of literature recommending the need for policies to increase the sustainability of diets for both health and environmental reasons, there is a clear need to understand why there has been such a significant lack of policy action on this issue at a global scale. This paper presents a systematic review of the application of political science theories in research on sustainable diet policy. Using key political science theories as a guide, this study aimed to systematically review the literature on sustainable diets to determine if any ideas and concepts consistent with these theories have been utilised to gain a greater understanding of the lack of policy action in this area. There were 296 papers that met the inclusion criteria of presenting policy ideas and recommendations on sustainable diets, however, only 17 of these papers provided any discussion on the process by which these policies could gain traction and support. This is reflective of the popular idea of ‘evidence-based policymaking’ whereby presenting more and/or better evidence can have a significant influence on policy. However in evidence-based policy making is a “vague, aspirational term, rather than a good description of the policy process” (Cairney, 2016, p.1) which in reality is far more complex.

These 17 papers included discussion of some key influences on policy making such as influence of coalitions/networks, evidence use, narratives and framing, institutional and political system factors, and the importance of value and belief systems and socio-cultural norms. However, often this was not the main aim of these research papers and thus the analysis lacked depth around these influences and did not specifically use a political science theory to guide the data analysis. A lack of application of robust policy process theories limits the ability to explain why policy action is lacking or to recommend strategies to help achieve policy change. Additionally, policy theories can help achieve a greater understanding of processes happening in sustainable diet policy and thus help inform policy actors on how they can better influence policy development in different political and socio-cultural contexts in the future

2. Background

2.1 Sustainable diets in the context of food policy

The concept of a 'sustainable diet' first appeared in the 1980s, with an emphasis on long term health and the avoidance of environmental degradation (Gussow & Clancy, 1986), however it is only in the last decade that sustainable diets have started to receive more attention in the literature. The interest has in part been driven by an increase in the number of modelling studies assessing the environmental impacts of different foods, meals, or total diets (Hallström et al., 2015). These diet modelling studies have shown that the type of food produced, animal-based or plant-based, has a large influence on GHG emission levels, with livestock production being responsible for 14 – 51% of global anthropogenic GHG emissions (conservative to more inclusive measurements) (Bailey et al., 2014; Gerber et al., 2013; Steinfeld et al., 2006). Thus, the greater the amount of meat (especially red meat) consumed, the higher the associated GHG emissions (Carlsson-Kanyama & González, 2009; Pathak et al., 2010; Scarborough et al., 2014; Soret et al., 2014; Stehfest et al., 2009). A systematic review of the environmental and health impacts of dietary change in high-income countries concluded that there are clear environmental benefits to modifying current dietary practices towards more sustainable choices, and that environmental benefits are largely proportional to the extent by which meat and dairy consumption can be reduced (Aleksandrowicz et al., 2016). Additionally meat-intensive diets have been associated with an increased risk of diseases such as heart-disease, diabetes and some types of cancer (Larsson & Wolk, 2006; McMichael et al., 2007a).

In response to the research evidence largely emerging from diet modelling studies there have been a number of suggestions in the literature on possible policies governments could use to tackle the issue. These have included information based instruments (i.e. labelling), market based instruments (i.e. subsidies and taxes), regulatory measures (i.e. government sustainability targets in the food domain), public procurement, information and behaviour change campaigns, and education initiatives (Farchi et al., 2017; Frenette et al., 2017; Garnett et al., 2015; Hallström et al., 2017; Hyland et al., 2017; Springmann et al., 2017). However, despite the environmental and public health benefits of sustainable diets, there has been very little, if any, uptake of policy actions by governments world-wide to meaningfully address the issue (see for example: Bailey et al., 2014; Bristow & Fitzgerald, 2011; Deckers, 2013; Garnett, Mathewson, Angelides, & Borthwick, 2015; Lang & Barling, 2013; Sedlacko, Reisch, & Scholl, 2013; Vázquez-Rowe, Larrea-Gallegos, Villanueva-Rey, & Gilardino, 2017). Porritt (2010) is not exaggerating when he notes, "Policy makers' attention to...meat eating is as close to zero as it is possible to get." Lang et al. (2010) and Westhoek et al. (2011) express similar sentiments about the current situation in which interest in and initiatives regarding sustainable diet policies, and in particular reduction of meat consumption, are practically nonexistent and seen as politically taboo.

It is clear that policy change to influence consumer behaviour towards more sustainable diets faces significant policy resistance. As with other complex policy issues such as obesity prevention this may be particularly the case for 'hard' policy options such as taxation of high carbon emission foods (Bryant, 2013; Clarke et al., 2016). A number of possible reasons for this policy resistance have been put forward, with many studies citing the complexities related to contemporary food production and consumption as being the major challenge for policy makers in taking action (Sedlacko, Reisch, et al., 2013). The difficulties in changing consumer behaviour have also received attention, for example changing food consumption practices will require a shift in consumer behaviour and this has been seen to be "politically

delicate” (Lang & Barling, 2013, p.3). As Lang and Barling (2013) argue “demanding or even subtly re-framing consumer behaviour change is an anathema to the neo-liberal ethos of consumer choice and sovereignty” (p. 3). Both governments and non-government organisations may not wish to impinge on individuals’ lifestyle decisions for fear of alienating supporters and being accused of ‘nanny statism’ (Dixon & Isaacs, 2013; Laestadius et al., 2014a). Others have suggested that governments are discouraged from taking action by a perceived lack of evidence of the efficacy of intervention strategies (Sedlacko, Reisch, et al., 2013) and opposition from powerful interest groups such as the food industry or agricultural producers (Garnett, 2014; Johnston et al., 2014).

Alongside these hypotheses there have also been some recent attempts in the literature to examine the processes occurring around the creation and implementation of policies in support of sustainable diets. These studies have largely focused on describing the competing interests involved in the governance of sustainable diets such as between government, civil society, consumers, and private sector stakeholders (Denniss et al., 2021; Dixon & Isaacs, 2013; Johnston et al., 2014; Lang & Barling, 2013; Reisch et al., 2013; Ridgway et al., 2015; J. Smith et al., 2016; Sulda et al., 2010). Other studies have examined the role of non-government organisations in the promotion of sustainable diet policies (Laestadius et al., 2013, 2014a, 2014b) and the alignment of research priorities to better reflect policy needs (Sedlacko, Pisano, et al., 2013; Sedlacko, Reisch, et al., 2013). These studies are useful for identifying some of the determinants that might be influencing decision making in the policy process around sustainable diets. These have included the knowledge, values and beliefs of policy makers (Garnett, 2013; Johnston et al., 2014a; Joyce et al., 2014; Smith et al., 2016) and the evidence-policy gap (James et al., 2017; Reisch et al., 2013; Sedlacko, Pisano, et al., 2013; Sedlacko, Reisch, et al., 2013). Power dynamics between stakeholders (Denniss et al., 2021; James et al., 2017; Lerner et al., 2013), the processes occurring in policy networks (Johnston et al., 2014; Joyce et al., 2014) and the influence of vested interests on policy makers (Reisch et al., 2013) have also been identified as factors affecting policy decisions.

While studies which elucidate potential policy determinants have a role to play in contributing to knowledge about why there has been so little policy action on sustainable diets they do not provide any in-depth understanding of *how* these determinants might shape decision making at various points in the policy process. For example the powerful influence of food and agricultural industry lobbying on policy makers has often been cited as a key reason for a lack of policy action, and the production and use of evidence highlighted as a significant factor in shaping policy decisions. Yet there is no research which examines critical questions such as *how* and on *whom* do policy actors exert influence in the policy process? And, how do policy actors form successful coalitions to influence policy decisions, and how are policies on sustainable diets informed by evidence? More broadly, there is a lack of understanding of where there are gaps and limitations from a political science perspective on sustainable diet policy. There is little guidance for where research needs to be focused and this both mirrors and contributes to the lack of action at a policy level.

2.2 Political science perspectives on sustainable diet policy

The questions outlined above are not isolated to the area of sustainable diets and indeed in areas such as public health and environmental policy there has been increasing attention to the need to utilise theories from other disciplines, particularly political science, to help conceptualise and make sense of the many interactions and variables involved in complex policy areas (Clarke et al., 2016; Clavier & de Leeuw, 2013a; Embrett & Randall, 2014; Fafard, 2015; Rickards et al., 2014). As Breton and de Leeuw argue, without robust theoretical grounding, policy failures and successes cannot be satisfactorily explained and “remain all but anecdotal accounts” (Breton & de Leeuw, 2011, p. 88).

The field of policy studies can be divided into two main orientations; *knowledge in* the policy process and *knowledge of* the policy process (Lasswell, 1971; Weimer, 2008). *Knowledge in* the policy process mainly refers to knowledge gained through policy evaluation and analysis (James & Jorgensen, 2009). Policy evaluation aims to examine and assess “the consequences of what governments do and say” (Dubnick & Bardes, 1983, p. 203) and is typically conducted *ex post*, where strengths and weaknesses of public projects and programs are evaluated using a multitude of methods (Bovens et al., 2008). As Smith and Larimer (2016) succinctly describe, policy evaluation empirically asks the fundamental question “what have we done?” (p. 5). In contrast policy analysis examines the *ex ante* question of “what should we do?”. Policy analysts seek to determine the best policies for governments and public authorities to adopt to address a particular issue or policy problem (Weimer, 2008). The challenge here of course is how “best” can be measured, or what it is measured against (Smith & Larimer, 2016). Distinct from the “what have we done” and “what should we do” questions of policy evaluation and analysis, policy process research asks questions about the why and how of policy making. For example policy process scholars seek to find out why certain policy issues capture the attention of governments, how coalitions or groups influence policy making, and how different institutional arrangements and history shape policy. There are a number of key political science theories that can help guide this analysis.

De Leeuw et al. (2013) describe a theory as a “clear and logically interrelated set of propositions, some of them empirically falsifiable, to explain fairly general sets of phenomena” (p.26). Within the field of political science numerous theories of the policy process have been developed (Sabatier, 2007) with their application ranging from being able to be broadly applied to any situation to in-depth modelling for very specific situations (Breton & de Leeuw, 2011). While there is no universal guide as to which theories of the policy process can be said to be ‘good’ theories, Sabatier (2007), an eminent researcher in contemporary political science, has identified theories of the policy process (see Table 1) which reasonably meet a set of minimal conditions:

1. Meet the criteria of a theory (specifies the scope of inquiry, details assumptions, provides a shared vocabulary amongst members of a research team, and clearly defines and relates concepts in the form of principles, testable hypotheses, and propositions).
2. Is indicative of an active research program via recent theoretical development and empirical applications.
3. Has a relatively broad scope that seeks to explain a substantial portion of the policy process

For the purpose of this review ‘Theories of the policy process’ will refer to the theories identified by Sabatier as meeting the minimal set of conditions. These will be the theories that are used to guide the systematic review and analyse the current gaps and limitations of current research into sustainable diet policies.

Table 1. Elements forming theories of the policy process (Adapted from Cairney & Heikkila, 2014)

Theory	Scope	Level of analysis	Relationships among key concepts
Multiple Streams Approach	Policy choices under condition of ambiguity	System (implicit) with focus on policy actors coupling the streams	Three independent streams that come together during ‘policy windows’ of opportunity which significantly increases the chance of policy adoption
Punctuated Equilibrium Theory	Political system usually in stable state punctuated by periodic major change	System (implicit)	Factors limiting change or generating incrementalism and factors leading to major change
Social Construction Framework	Target populations and policy dynamics	System (implicit)	Social construction of target groups influences policy agenda and policy rationales
Advocacy Coalition Framework	Interactions of advocacy coalitions influencing policy change	Coalitions and policy subsystems	Factors influencing formation of coalitions, policy change and policy learning
Narrative Policy Framework	How narratives influence policy agendas, policy decisions, policy change and public opinions	Micro (individual), Meso (coalitions, institutions) Macro (Societal)	Influence of narratives on public opinion/mood, coalition strategies, policy making and learning
Institutional Analysis and Development Framework	How institutional arrangements are devised to solve collective action problems and outcomes of these arrangements	“Action arena” any social space where individuals interact	At the theory level: Factors and principles that lead to collective action and principles of the governance of common pool resources
Diffusion of Innovations	Policy diffusion and innovation	Venues/states where policy making takes place	Factors in policy diffusion and adoption
Policy Feedback Theory	Influence of policies on politics and subsequent policy making	System (implicit)	How public policies affect the power of groups, the meaning of citizenship, policy agendas and governance structures – all of which impact future policies

Theories of the policy process incorporate a range of important elements which influence decision making and policy change including the rationality of decision makers, ideas and narratives, institutional factors,

the influences of coalitions and networks and the socio-cultural context in which policy making takes place. As Breton and de Leeuw (2011) identify theories of the policy process need to be able to explain the links between the goals, values, beliefs, and actions of potentially hundreds of policy actors interacting in the policy process which eventuates in specific policy outcomes. These theories look at the conditions under which particular policy events (i.e. decisions on resource allocation and implementation of policy, preferences for particular intervention types, and inclusion or exclusion of different stakeholders) take place and how these factors determine support or otherwise for particular policy positions (Breton et al., 2008; Breton & de Leeuw, 2011). As such multiple theories are needed to describe, explain and highlight “different and sometimes overlapping or nested partitions of the policy process to account for a variety of interactions” (Weible, 2014, p.5).

Given the large body of literature espousing the need for policies to increase the sustainability of diets for both health and environmental reasons, there is a clear need to understand why there has been such a significant lack of policy action on this issue at a global scale. The use of theories of the policy process could help not only examine the reasons for this policy inaction but offer a valuable guide to policy advocacy practice by providing an understanding of the barriers and facilitators to policy change (Breton & de Leeuw, 2011). Identifying if any, and what type of theories of the policy process (and the ideas contained within these theories) have been used to examine sustainable diet policy is a first step in identifying where more research needs to be directed. This study thus aimed to systematically review the literature on sustainable diets to determine if any ideas and concepts consistent with theories of the policy process have been utilised to gain a greater understanding of the lack of policy action in this area.

3. Method

The systematic review was undertaken to broadly align with the guidelines laid out in the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement (Moher et al., 2009). These guidelines were developed to help researchers use systematic methods which reduce bias to enable the production of “reliable findings from which conclusions can be drawn and decisions made” (Liberati et al., 2009, p.e2).

The aims of this narrative review are to examine the current focus of research on sustainable diet policies and where there are current gaps and limitations with research on sustainable diet policies and what opportunities exist for future research in this area. A systematic electronic search was conducted in June 2021 to identify relevant publications from the following databases: CINAHL, ScienceDirect, Scopus, Web of Science, ProQuest, PubMed, PLoS and JSTOR. The reference lists for included papers were also searched for relevant studies. Search terms for all databases included the following: (climate change OR greenhouse gas OR sustain*) AND (food OR diet* OR nutrition* OR meat) AND (policy OR policies OR govern*). The searched fields were keyword, title and abstract where available. Searches were limited to English language studies published until July 2021.

Titles (and then abstracts where available) were screened for relevance to sustainable diet consumption. Citations were categorized into two groups: i) possibly relevant studies; and ii) excluded studies. The full

text of all candidate studies (i.e., possibly relevant studies) was obtained, using a low threshold for inclusion if there was any doubt. These publications were then screened against the inclusion criteria (see Table 2) to determine eligibility. Papers were excluded if they focused only on production side measures of sustainable diets (i.e. discussed policies aimed at agricultural production) and if they were not specific to consumption of sustainable diets (i.e. examined food systems or food security more generally).

Table 2

Inclusion and exclusion criteria for the identification of journal articles reporting on the consumption of sustainable diets

<p>Inclusion criteria</p> <p>The article:</p> <ul style="list-style-type: none"> • Is in a peer-reviewed journal indexed in CINAHL, SciDirect, Scopus, Web of Science, ProQuest, PubMed, Jstor, PLOS • Written in English • Published before July 2021 • Features in abstract, title, or subject headings the search terms: (greenhouse gas OR climate change OR sustain*) AND (nutri* OR diet* OR food OR meat) AND (policy OR policies OR govern*) • Has a focus on the consumption of sustainable diets <p>Exclusion criteria</p> <p>The article:</p> <ul style="list-style-type: none"> • Has a focus on production side on production side measures of sustainable diets i.e. technological advances to mitigate carbon emissions from agricultural production • Does not have a specific focus on sustainable diets (i.e. focuses on food systems or food security more generally) • Is an opinion piece, editorial, book review or conference proceeding

Figure 1 outlines the selection process. The search process identified 4,157 articles, leaving 3,827 after duplicates had been removed. After the titles and/or abstracts were screened for relevance, 516 articles remained. A further 219 articles were excluded after full-text review found that they did not cover consumption and therefore did not meet the inclusion criteria. The remaining 297 eligible papers were then further categorised to reflect to what extent they included mention of policy on sustainable diets:

1. Includes policy recommendations only (e.g. provided recommendations such as taxes or education but no discussion on the policy change process) (N = 195)
2. Includes policy recommendations and policy analysis or evaluation (N = 18)
3. Includes policy recommendations and discusses influences on the policy process consistent with ideas and concepts from a policy process theory (but does not specifically mention this theory by name) (N = 17)

4. Directly applies a theory of the policy process in analysing sustainable diet policies (N = 0)

4. Results

4.1 Themes from included studies

Following the full text screening process 297 papers met the criteria for inclusion. Almost all papers focused on consumption of sustainable diets in western economies including Europe, the USA, Canada, Australia and New Zealand. Fifteen papers examined non-western nations including three each from Brazil, India and China, two from the Middle East and one each from Nepal, Peru, North Africa and Vietnam. There were nine main themes identified from the included studies focusing on consumption of sustainable diets. These themes were: diet modelling, consumer behaviour/attitudes, reducing meat consumption, health, policy, dietary guidelines, taxes/carbon pricing, food waste and public procurement (see Figure 2).

Just under half (N = 128, 47%) of all included papers were *diet modelling* studies which examined the environmental impacts of different dietary patterns and/or food choices. This included analysis of the way in which different diets impact a range of environmental variables such as greenhouse gas emissions, energy consumption, water use, land change use, and loss of biodiversity. Sixty-two papers focused on *consumer behaviour/attitudes*. These papers covered a variety of areas relating to consumers such as their attitudes towards and knowledge of what constitutes a sustainable diet (e.g. Annunziata & Scarpato, 2014; Barone et al., 2018; Benedetti et al., 2018; Campbell-Arvai, 2015; Clonan & Holdsworth, 2012; Curry et al., 2015; Dixon & Isaacs, 2013), marketing approaches to shift consumers to adopt more sustainable diets, and methods for raising consumer awareness of sustainable diets.

Thirty-four papers specifically explored *reducing meat consumption* as the primary issue needing to be addressed around sustainable diets. A range of ideas and analysis were covered such as in-depth examination of the environmental impacts of meat consumption and the need for reduction in consumption to mitigate greenhouse gas emissions (e.g. Hedenus et al., 2014; McAlpine et al., 2009; McMichael et al., 2007b; Ripple et al., 2014; Singh et al., 2013; Weis, 2015) and ideas on how to achieve a reduction in meat consumption. A small subset of papers focused on different stakeholder views and actions around meat consumption such as three related papers by Laestadius et al. (2013, 2014a, 2014b) which examined the role of Non-Government Organisations in promoting reduced meat consumption to tackle climate change and one paper by Lerner et al., (2013) which investigated the views of a range of stakeholders in Sweden on their views on meat reduction for sustainability reasons including government agencies, meat producers, politicians and non-government organisations.

Twenty-three papers had a *health* focus. These either linked the consumption of sustainable diets to better health outcomes or focused on evidence showing that healthier diets are also more environmentally sustainable. Some focused on specific health issues such as obesity or other chronic diseases, while others examined ways to promote healthier and thus more sustainable diets. Nineteen papers had a main theme of sustainable diet *policy* and focused on evaluating policy options, analysing current policies, or

providing an account of recent policy developments. Sixteen papers discussed sustainable diets and their integration into national *dietary guidelines*. Fifteen papers focused on the implementation of *taxes/carbon pricing* (including labelling) as a means to increase consumption of sustainable diets, three papers examined *food waste* as an issue in sustainable diets, and one paper discussed *public procurement* as a way to increase sustainable diet consumption.

4.2 Application of theories of the policy process

This review did not identify any papers which specifically applied one of the identified political science theories from Table 1. However, there were a number of papers which included discussion of policy in terms of making recommendations, analysing or evaluating policies and discussing influences on the policy process which contained elements of the some of the ideas and concepts from these political science theories. We discuss these in the section below.

1. Includes Policy Recommendations Only

Of the 296 papers that met the inclusion criteria 85% (N=252) included some form of policy recommendations or suggestions. In the vast majority of these papers (N=195) policy recommendations were made without any analysis or empirical evidence on the political and policy context within which the recommendations would need to occur and contained no discussion of the processes by which these policies might come to be adopted or implemented by governments. The most common policy recommendations in *diet modelling* studies were:

- The need for consumer education and/or information campaigns on sustainable diets (e.g. Carlsson-Kanyama & González, 2009; Ulaszewska et al., 2017).
- Implementing taxation (e.g. Saxe et al., 2012; Scarborough et al., 2014).
- Labelling of foods with greater environmental impacts (e.g. Annunziata, Agovino, et al., 2019; Wilson et al., 2013).

Recommendations in papers focused on *consumer attitudes/behaviour* also largely focused on governments providing greater consumer education and environmental labelling of food products. Two papers suggested changes to dietary guidelines and two suggested government support for local food networks. Similarly, papers focused on *reducing meat consumption* mostly recommended increased consumer education and information provision from governments, although again without any discussion of how this might occur taking into account political and socio-cultural contexts. Two papers recommended taxing carbon intensive meat products, and one paper explicitly stated that governments need to stop promoting the consumption of meat.

Recommendations in papers with a *health* theme were broader, with five papers identifying the need for inter-sectoral and cross-disciplinary action to act on sustainable diets (Finley et al., 2017; Friel et al., 2009; Kevany et al., 2018; Macdiarmid, 2013; Sulda et al., 2010) and two papers mentioning the need for governments to focus on the link between climate change and health (Hallström et al., 2017; Tilman &

Clark, 2014). Others also suggested education and information (Lowe, 2014; Michaelowa & Dransfeld, 2008; Quam et al., 2017), emphasising culturally appropriate food (Cavaliere et al., 2018), taxing unhealthy and unsustainable food (Briggs et al., 2013; Lowe, 2014; Michaelowa & Dransfeld, 2008; Quam et al., 2017) and including sustainability in dietary guidelines (Friel et al., 2014). Unsurprisingly most papers that focused on dietary guidelines recommended that environmental sustainability be included in national dietary guidelines, and that populations receive information and education on how to eat sustainably according to dietary guidelines (e.g. (Batlle-Bayer et al., 2019; Irz et al., 2019; Oshiro et al., 2018). Papers on *taxes/carbon pricing/labelling* and *food waste* inevitably recommended that initiatives to address these factors be implemented by governments (e.g. (Annunziata, Mariani, et al., 2019; Bonnet et al., 2018; Springmann et al., 2017; Walia & Sanders, 2019). Papers focusing on *policy* are discussed in the sections below.

2. Includes policy recommendations and evaluates or analyses policies but does not discuss influences on the policy process

Eighteen papers were classified as policy evaluation or analysis papers (See Appendix 1) with five having a theme of reducing meat consumption, one a theme of consumer behaviour attitudes, one a theme of public procurement and the remaining papers having a general *policy* theme. Policy evaluation and analysis papers tend to focus on the *why* and *what* of sustainable diet policy but not the *how*. Papers may discuss the positives and negatives of different policy options, describe how current or past policy has been approached, or make recommendations for the types of policies required. Papers in this section provide excellent evaluation on policy options against established criteria but lack a focus on the policy process within a given political and socio-cultural context. This is not a criticism of these papers per se, but a commentary on where particular gaps are in the research literature.

Papers that developed frameworks in this review included Downs et al (2017) who developed a policy analysis framework for sustainable diets and applied it to national policies in Nepal, and Friel et al. (2014) who developed a framework to support cross-sectoral health/food policy discussions in Australia with an emphasis on dietary guidelines. Other papers focused on reviewing current and past sustainable diet policies in different contexts, including in the European Union. Lafranconi and Birt, (2017), Lang and Barling, (2013) and Martin and Danielsson, (2016) reviewed the sustainable diet policy terrain in the European Union by summarising policy developments and highlighting difficulties in policy integration (Lang & Barling, 2013) and analysing costs and benefits and effectiveness of policies (Lafranconi & Birt, 2017; Martin & Danielsson, 2016). Other authors took a more global perspective such as Garnett (2011) who discussed proposed policy approaches to mitigate greenhouse gas emissions in the food chain, and Lang and Mason (2017) who outlined national sustainable diet policy in various countries including Brazil, Australia, France and Qatar. Almost all of these policy evaluation papers made recommendations based on their review or evaluation of policies against specific criteria such as Lafranconi and Birt (2017) who stated that policies for sustainable healthy nutrition “should be supported by overarching legislation, an institutional infrastructure, educational structures that include appropriate capacity building” (p. 30) while Reisch et al. (2013) identified “A first priority...is to develop integrative, cross-sectoral, population-wide

policies” (p.15). These types of broad recommendations require research into why they have not happened to date, and what might be barriers or enablers of policy change. Applying theories of the policy process to sustainable diet policy would address gap.

Thus while there are some thorough and well-developed criteria against which to judge sustainable diet policies which have been applied, they lack analytic depth on the process by which a policy could change. There could be greater focus on judging policy options against their fit within a political and socio-cultural context in addition to judging against a set of predefined evidenced based criteria. Having some understanding and knowledge of the social and political context is a prerequisite for understanding the utility of policy options which is something that is currently not the focus of these evaluation pieces.

The common approach in the research literature on policy evaluation papers is to develop frameworks that could be applied by governments to develop policies or used to evaluate the effectiveness of current policies, but they do not focus on the policy change processes that would need to occur in particular political and socio-cultural contexts to enable policy action. An understanding the processes by which policy could gain traction within a particular political and socio-cultural context provides guidance for the content of policy recommendations and frameworks which could be factored into these evaluation frameworks and pieces.

3. Includes policy recommendations and discusses influences on the policy process but does not apply a theory of the policy process

Of all the papers reviewed there were only 17 that included discussion of one or more influences on the policy process which had ideas and concepts seen in the political science theories reviewed in the Introduction (See Appendix 2).

Policy process influences identified were:

- i. Coalitions/networks (Beverland, 2014; de Bakker & Dagevos, 2012; Denniss et al., 2021; S. James, 2015; Jelsøe, 2015; Johnston et al., 2014; Joyce et al., 2014; Laestadius et al., 2014a; Lawrence et al., 2015; Rose et al., 2021; Santaoja & Jauho, 2020)
- ii. Organisational, institutional and political system factors (Beverland, 2014; de Bakker & Dagevos, 2012; Denniss et al., 2021; S. James, 2015; Johnston et al., 2014; Lawrence et al., 2015; Rose et al., 2021; Santaoja & Jauho, 2020; Sedlacko, Pisano, et al., 2013)
- iii. Narratives/Framing (Beverland, 2014; S. James, 2015; Jelsøe, 2015; Laestadius et al., 2013; Rose et al., 2021; Sedlacko, Pisano, et al., 2013)
- iv. Dominant political ideology (Beverland, 2014; Denniss et al., 2021; Jelsøe, 2015; Rose et al., 2021)
- v. Use of evidence (Dagevos & Voordouw, 2013; S. James, 2015; Jelsøe, 2015; Johnston et al., 2014; Laestadius et al., 2014a; Lawrence et al., 2015; Rose et al., 2021; Simmonds & Vallgård, 2021)
- vi. Personal values, beliefs, and socio-cultural norms (Beverland, 2014; Dagevos & Voordouw, 2013; de Bakker & Dagevos, 2012; Jelsøe, 2015; Laestadius et al., 2014a, 2014b; Santaoja & Jauho, 2020; Seed, 2015)

However, although the papers in this section identified some of these elements no papers specifically mentioned any policy process theories by name. Below we discuss the policy process influences identified in the 17 papers.

i. Influence of Coalitions/Networks

Eleven of the seventeen papers mentioned the influence of coalitions or networks on sustainable diet policy. The way in which coalitions or networks of policy actors are integral parts of the policy process is highlighted in theories of the policy process such as Kingdon's Multiple Streams Analysis (Kingdon, 1995) which discusses the importance of policy entrepreneurs in influencing policy change and the Advocacy Coalition Framework which organises policy actors into advocacy coalitions based on shared beliefs and co-ordination strategies (Jenkins-Smith et al., 2014).. While these papers mentioned the importance of coalitions these were not analysed in depth in regard to the strength or otherwise of these networks.

Eight papers mentioned power imbalances between sustainable diet policy actors (Beverland, 2014; de Bakker & Dagevos, 2012; Denniss et al., 2021; S. James, 2015; Jelsøe, 2015; Rose et al., 2021; Santaoja & Jauho, 2020; Seed, 2015) and identified the food industry and/or farming lobby groups as having greater political access and influence, which was concluded to be a significant reason for limited political action on sustainable diets. However, again these eight papers did not conduct extensive analysis of power imbalances, rather they focused on the "what" is happening rather than the "how" and "why". Johnston et al. (Johnston et al., 2014), Joyce et. al (Joyce et al., 2014) and Lawrence et. al. (Lawrence et al., 2015) mentioned the need to understand policy networks and the way different policy actors influence political agendas with Johnston et al. (Johnston et al., 2014) stating that to overcome political challenges to governance of sustainable diets will require "co-operation, coordination, and negotiation across all stakeholder groups" (p. 426). However without empirical evidence on the values and beliefs of different stakeholders or the ways in which policy actors form coalitions and networks and exert political influence in particular political contexts it is difficult to draw any firm conclusions on their importance as barriers or enablers of policy change.

Two papers by James et al. (2015) and Denniss et al. (2021) attempted to address this gap by using empirical evidence from food policy actors in Australia to help understand the barriers and enablers of policy action on consumer adoption of healthy and sustainable food behaviours. James et al. (2015) conducted semi-structured interviews with food policy stakeholders including the food industry, government, and non-government organisations while Denniss et al. (2021) conducted a Delphi study with similar stakeholders. Based on the barriers and enablers identified in the interviews James et al. (2015) developed a framework for intersectoral action and Denniss et al. (2021) made a number of similar policy recommendations including the need to build relationships with key stakeholders and developing greater understanding of the policy process. These were one of the few examples that provided a bit more analytic depth on the policy process albeit that a specific political science theory was not used in the analysis. This section of the paper has highlighted how there is a considerable gap in application of political science theories on coalitions and networks in relation to sustainable food policy. This hampers

action in this area as practitioners and policy makers have little research by which to guide their actions and strategies.

ii. Organisational, institutional and political systems

The study of institutions, organisations and political systems within the policy process has been the focus of much work in political and social sciences (Mahoney & Thelan, 2010) for example the Institutional Analysis and Development Framework is a theory of the policy process which provides a way to think about how different institutions cultivate collective action (Cairney, 2019). Six papers mentioned either organisational factors, institutions or political systems as impacting sustainable diet policy. From interviews with stakeholders involved in Australian sustainable diet policy James (2015) identified that organisations give little attention to sustainable diets as many don't see it as "core business" largely because of a lack of institutional or political interest or prioritising of sustainable food supply and demand issues. Similarly, in investigating factors influencing NGOs to campaign on reduced meat consumption Laestadius et al (2014) found that depending on their focus (environment, food, health) some NGOs had a low level of engagement with the issue as it was not seen as their primary focus. However, no policy theories were specifically mentioned as having guided the analyse of their empirical data.

Institutions and political systems were discussed by Santaoja and Jauho (2020) in the context of the Finnish Dietary Guidelines. They identified a situation of institutional ambiguity in regards to where and who is making sustainable food policy with no political consensus on what sustainable diets. It was noted that policy makers had little independence in the contexts in which they worked and were thus reluctant to experiment with policy on sustainable diets. Rather than using any policy theories the authors employed the concept of ontonorms to help understand the integration of sustainability into dietary guidelines.

iii. Narratives/Framing

Many policy theories discuss the links between evidence, persuasion, and the framing of policy problems (which sit within a broader environment where particular beliefs may dominant discussions) (Cairney et al., 2016). One theory of the policy process – the Narrative Policy Framework, explicitly focuses on the importance of narratives in creating policy change (McBeth et al., 2014). The way sustainable diet policy has been framed was mentioned in five papers (Beverland, 2014; S. James, 2015; Jelsøe, 2015; Johnston et al., 2014; Laestadius et al., 2013). For example Beverland (2014) commented that marketers, promoters and critics have often framed vegetarian or "ethical" diets as something for those who are culturally privileged rather than for the mainstream and language around reducing meat consumption is framed in anthropogenic terms which conceals how meat consumption impacts sustainability. Additionally he identified an economic logic as being pervasive in sustainability narratives. Similarly, James (2015) showed how in the Australian context economic themes and frames are often used by industry stakeholders when they define sustainability and stakeholders describe concepts of health and sustainability separately with health receiving the greatest emphasis. In discussing dietary guidelines Jelsøe (2015) argued that dietary guidelines act to reproduce and strengthen the discourse around food and health where health issues are seen as isolated from other considerations such as sustainability.

However although some narrative and framing issues were identified as possible barriers to policy action on sustainable diets no papers utilised any narrative or framing policy theories to attempt to further analyse narratives around sustainable diet policy. Again this is another potential limitation whereby the use of a theory to guide the analysis may reveal possible strategies and actions to promote sustainable dietary policies

iv. Dominant political ideology

A number of papers made mention of dominant economic or neoliberal political ideology acting as a barrier to sustainable diet policy. This often has interactions with other influences on the policy process. For example in their examination of how livestock industry practices influence sustainable diet policy in the US Rose et al. (2021) discussed the way industry framed their practices as of economic importance in order to align with the dominant economic rationalist ideology of government. Denniss et al. (2021) similarly noted that neoliberal ideology and prioritisation of economic interests act to exacerbate a lack of “political will” by governments to act on sustainable diets.

v. Use of Evidence

There is a large literature demonstrating the gap between production of evidence and a policy making response (Cairney et al., 2016; Clavier & de Leeuw, 2013b; VanLandingham & Silloway, 2016) in many policy areas including social, environmental and health policy. However studies in these areas have rarely utilised insights from political science policy theories to explain the evidence-policy gap (Cairney et al., 2016; Clavier & de Leeuw, 2013b). Similarly although six papers in this review touched on the use of evidence in sustainable diet policy none used a policy theory to further analyse evidence use in the policy context. Dagevos and Voordouw (2013) pointed out that despite there being abundant scientific evidence on the sustainability problems of meat consumption “political attention is conspicuously absent”. In contrast James (2015) found it was a lack of evidence of what constitutes as sustainable diet that acted as a barrier to inter-sectoral action on sustainable diets. Jelsøe (2015), Johnston et al. (2014) and Lawrence et al. (2015) also commented that their either wasn’t enough evidence on the metrics of sustainable diets in particular contexts or that the evidence was too fragmented or overwhelming for politicians to take meaningful action. Additionally Jelsøe (2015) noted that the food industry has questioned the evidence around sustainable diets as a way to avoid sustainability being included in dietary guidelines. Utilising empirical evidence combined with policy theory to explore these hypotheses would enable a greater understanding of barriers to policy action.

vi. Personal values, beliefs and socio-cultural norms.

Theories of the policy process recognise the importance of the public mood, and the values and beliefs of stakeholders in the way the policy process operates. A number of authors in this review commented on the way meat consumption is associated with socio-cultural norms and beliefs. Beverland (2014) argued that in developed economies consumption becomes more about expressing identity than fulfilling basic needs with consumption of meat being the most obvious example, reflecting identity issues of gender, class, race,

and culture, which acts as a barrier to political action on sustainable diets. Similarly Dagevos & Voordouw (2013) commented that it is unlikely consumers would be receptive to policies around reduced meat consumption due to a carnivorous food culture and Jelsøe (2015) noted that providing advice on what people should eat can be perceived as a threat to individual choice. In their exploration of NGO messaging Laestadius et al. (2014a, b) identified a negative feedback loop on messaging to reduce meat consumption – when governments and the public see the issue as unpopular or uninteresting NGO's reduce their messaging efforts which in turns deprives the issue of the attention it needs.

5. Discussion

This review shows there is a significant lack of research utilising theories of the policy process to help understand the lack of policy action on sustainable diets. While it would not be expected that all sustainable diet researchers are across political science literature, the degree to which these theories and approaches is missing is a significant gap both from a research and applied perspective. The utilisation of a political science theory to guide analysis may yield further insights into the determinants and processes by which policy traction around sustainable diets could be advanced. This in turn would provide policy actors with further guidance on actions and strategies they could be taking to increase policy support. At present, the research is dominated by modelling studies and evaluations of policies based on objective criteria which are largely devoid of an understanding the political and socio-cultural context in which this policy change would need to occur. This is a significant research and practice gap.

This review reveals there is a considerable imbalance in the production of research focusing on scientific evidence around sustainable diets (i.e. diet modelling studies) and the policies that 'should' be enacted based on this evidence, relative to research on the policy process itself. This is a common problem identified in the 'evidence-policy gap'. Cairney and Oliver (2017) highlight how there is a lack of appreciation from the research community on how policies are developed and the use of evidence. Power is shared between different actors in a complex and unpredictable policy making environment (Cairney & Oliver, 2017; Cairney, 2016), and policy makers are constrained by "bounded rationality" whereby due to biological and cognitive constraints they are unable to take into account all evidence which may be relevant for a particular policy problem (Baumgartner et al., 2014; Workman et al., 2009; Zahariadis, 2014). To compensate for this evidence overload policy makers use two shortcuts – 'rational', where they prioritise certain sources of information and pursue clear goals, and 'irrational' where they use values, beliefs, emotions, and gut feelings to make fast decisions (Cairney & Oliver, 2017).

As Cairney and Oliver identify, the key issue with many studies is that focus is only directed to the first shortcut, where the problem is seen to lie in *uncertainty* and lack of information. Solutions are thus focused on the creation of hierarchies of evidence, improving supply of evidence to policymakers, and encouraging knowledge-transfer activities. Neglected is the broader process of coalition forming, manipulation, and persuasion to reduce *ambiguity* by establishing a dominant way to "frame" a particular policy problem (Cairney & Oliver, 2017). As a result, proposed solutions or policy recommendations are not on policy theory but on a misunderstanding of the policy process and built on "an often implicit and

untested assumption that policy making should be as ‘evidenced based’ as medicine” (Cairney & Oliver, 2017, p.2).

A focus on reducing uncertainty for policy makers by presenting more or better evidence is evident in the sustainable diet literature whereby the largest concentration of papers are diet modelling studies which seek to establish a quantitative evidence base around how different diets contribute to variables such as greenhouse gas emissions, water use, or land use. Almost of these diet modelling studies also make some kind of policy recommendations in their conclusions, commonly around the need for governments to conduct consumer education campaigns or tax carbon intensive foods. However these recommendations are being made without any discussion or regard for factors which influence the policy process or for the socio-cultural or political contexts in which the policies would need to be developed and implemented. Without these insights it is difficult to judge how likely or not it would be that policy makers would pay attention to these types of recommendations let alone adopt them. As a result these policy recommendations are not robust enough to be used by non-government policy actors and stakeholders in any advocacy or policy lobbying sense.

As Cairney and Oliver (2017) argue, recognising that policy makers have a tendency to base judgements on their well-established value and belief systems and make decision making shortcuts based on emotions and familiarity with information is a key understanding required for stakeholders advocating policy change. Persuasion and manipulation in this context thus become vitally important in inducing policy makers to frame a problem in one principal way. The use of uncomplicated and easily understood message frames which “manipulate people’s biases, apportioning praise and blame and highlight...the moral and political value of solutions” (Cairney & Oliver, 2017, p. 4) is central to any strategy which seeks to persuade policy makers. Without a focus on the way policy makers understand and react to problems policy advocates will find it much harder to exert any influence, and instead find themselves only responding to sudden demands from policy makers for evidence-based solutions to pre-defined problems (Cairney, 2011).

A lack of knowledge on the policy process has been noted in health promotion more broadly where an absence of the use of political science theories by academics and non-government policy actors is seen as an impediment in achieving some of the broader policy goals of the sector (Breton et al., 2008; Breton & de Leeuw, 2011; Clavier & de Leeuw, 2013b). Klein and Marmor (2008) make the point that for policy scholars to fully comprehend public policy they need to have knowledge of the paradigms behind the choices of policy makers, and be able to analyse the institutions within which governments operate and the interests of the actors involved. Thus the actions of democratic governments (*policies*) are firmly intertwined with their larger concern of legitimately gaining and maintaining office (*politics*). Klein and Marmor (2008) comment that while this idea is uncontentious it is often ignored in rationalistic approaches to policy research. Insufficient attention being paid to how the policy process works also reduces the chance of getting policy traction as there is a lack of understanding of key elements in the process such as how to frame the policy message, forming coalitions, and the timing of such campaigns. The expectation is not that researchers need to also perform an advocacy role but unless their research is presented in certain

ways it becomes less likely policy makers will pay attention to it or use it in policy decision making (Cairney et al., 2016).

The gap identified in this review though is much bigger than just a lack of some of the techniques and approaches suggested by Cairney (2018; 2016; 2017). We found no papers that used a theory of the policy process to analyse empirical evidence on sustainable diet policy. Without a robust understanding of the factors influencing the policy process around sustainable diets it becomes far more difficult for researchers and other policy actors such as non-government organisations to make policy recommendations that have a chance of being adopted or to know how, where and what policy advocacy should be focused on. Given the large number of papers which mention the global lack of policy action to shift consumers towards sustainable diets this research gap is significant.

While we identified no papers that used a theory of the policy process a small number of papers did discuss or mention some influences on the policy process that are regularly included as elements in theories of the policy process. Most commonly mentioned was the influence of coalitions or networks on the way sustainable diet policy is being made with a focus on power imbalances between stakeholders' ability to influence policy. The power of the food industry and/or farming lobby groups in exerting political influence was mentioned in a number of papers (e.g. Beverland, 2014; de Bakker & Dagevos, 2012; James, 2015) and seen as a significant factor in the limited policy action on sustainable diets to date. However only the papers by James et al. (2015) and Denniss et al. (2021) used empirical data to investigate this assumption although the authors did not specifically mention having analysed the results through a particular political science theory. Rather barriers and enablers to policy action on sustainable diets were organised thematically with these themes then used to create an action framework designed to help encourage inter-sectoral action (James, 2015) and to make policy recommendations (Denniss et al., 2021). While welcome, this type of research could be further strengthened by applying theories of the policy process, for example using a theory such as the Advocacy Coalition Framework (Jenkins-Smith et al., 2014) could provide greater insights into the policy core beliefs of sustainable diet advocacy coalitions and how they co-ordinate actions to influence a policy subsystem. The increased insight and knowledge from application of a theory of the policy process would then help strengthen any proposed interventions or solutions such as the action framework devised by James et al. (2015).

Other policy influences identified in some of the papers included the narratives and framing used to communicate sustainable diets as a policy problem, institutional, organisational and political system factors, the use of evidence and the influence of personal values, beliefs and socio-cultural norms. However most papers with the exception of those by James (2015), Denniss (2021) and Laestadius et al. (2013, 2014a, 2014b) did not use empirical evidence to support their discussion of these policy change elements. Rather policy change processes were presented more as hypotheses by the authors to account for the lack of policy action. For example Johnston et al. (2014) cite a lack of evidence on measurement of what constitutes a sustainable diet as a reason "policymakers are unable to make decisions or recommendations to advance the concept of sustainable diets" (p.426). While it may be that some of these hypotheses are correct, a lack of use of policy process theories to test these hypotheses in a robust

way limits any conclusions being made about why meaningful political action on sustainable diets is globally absent. For example application of a theory such as the Narrative Policy Framework (McBeth et al., 2014) which utilises empirical evidence to examine the implicit truth that narratives have power by asking “do narratives play an important role in the policy process?” (McBeth et al., 2014, p. 225) could provide greater clarity on the narratives in play in sustainable diet policy and how these are shaping policy action/inaction. Likewise examining sustainable diet policy through the lens of a theory of the policy process such as the Institutional Analysis and Development (IAD) Framework could assist in gaining greater insight into the institutional factors shaping the problem and its potential solutions. The IAD framework originated with a quest by policy scholars to explain how people develop institutional arrangements to “solve collective action problems and provide shared benefits” (Ostrom et al., 2014, p. 271), making it well suited to analysing a complex policy issue like sustainable diets.

As identified in a number of papers, personal values, beliefs and socio-cultural norms also shape decision making by policy makers and influence which problems become the focus for policy. For example a few papers in this review discussed the influence of socio-cultural norms on consumption of meat with this being perceived as a barrier to policies on sustainable diets. Jelsøe (2015) hypothesised that socio-cultural meat eating norms reduce politicians willingness to implement policies to shift consumers to eating less meat as they believe these type of policies would be unpopular with the public. Similarly in examining NGO messaging on reducing meat consumption Laestadius found that NGO’s reduce their messaging around issues perceived to be unpopular with politicians and the public – creating a negative feedback loop in what politicians perceive to be a problem the public wants addressed. Utilising theories of the policy process can provide increased insight into how values, beliefs and norms influence policy making and how this means certain issues come to be perceived as policy problems decision makers need to solve. Notably Kingdon’s Multiple Streams Analysis (Kingdon, 1995) includes the “problems stream” which comprises a variety of conditions that citizens and policy makers currently identify as public problems that they want addressed (Henstra, 2010), such as climate change, reduced health budgets, inflation, and so on. Not all conditions become problems, as Kingdon (1995) states, problems contain “a perceptual, interpretive element” (p. 10). Conditions which come to be perceived as problems are the ones which receive the greatest attention. Zahariadis (2014) suggests that a range of values is usually associated with a specific issue and that changes in a particular condition may disrupt these values thereby stimulating attention and interest. People also identify conditions as problems by allowing their values and beliefs to guide their decisions. While the MSA has been applied extensively to policies in a variety of settings and across national, sub-national, and supra-national levels, none of the papers in this review utilised this theory to examine sustainable diet policy.

It should also be noted that the policy change influences identified in papers in this review and which are elements in policy theories are not mutually exclusive and are often highly interrelated (Clarke et al., 2016). However this review also shows that the literature on sustainable diets is quite heterogeneous in the sense papers tend to focus on one main theme relating to sustainable diets such as consumer attitudes, diet modelling, health, or dietary guidelines. Thus policy change processes identified tend to be discussed in relation to the main theme of the paper with little consideration of their interactions with other elements

influencing the policy process. This points to a need for more sustainable diet research that utilises theories of the policy process that consider a multitude of influences to examining complex policy areas. Theories such as Kingdon's Multiple Streams Theory, the Advocacy Coalition Framework, and Punctuated Equilibrium Theory for example all consider numerous crucial influences on policy decision making including network and coalition influences, ideas, institutional factors, and the rationality of decision makers as well as the importance of the external socio-cultural and political context. They also highlight how these influences are inter-connected to more clearly explain potential means for policy adoption (Weible, 2014). Policy scholars have also suggested that gaining a variety of perspectives by employing more than one theory of the policy process can provide a more comprehensive examination of the complexities involved in policy making for a particular policy area (Breton et al., 2008; Clavier & de Leeuw, 2013a; Nowlin, 2011).

This review highlights the need for greater use of political science theories of the policy process to the study of sustainable diets to help inform how policy decision making is being made in this area, where there may be greater opportunities for policy advocacy efforts and to identify where barriers to policy adoption lie. Without application of such theories studies may be more limited in their ability to explain a lack of policy action and elucidate which policy options would be most likely to gain the attention of decision makers. Further, a greater understanding of how the policy process is operating in the area of sustainable diets may help inform policy actors on *how* they can best influence future policy making and the best strategies for different political and socio-cultural contexts. Given the ample evidence on the need for a global shift to more sustainable diets to help mitigate climate change and other environmental impacts future research that uses robust political science theories is urgently needed.

6. Conclusion

This review examined the application of theories of the policy process in sustainable diet research. It was found there was a significant lack of papers focusing on the policy aspects of sustainable diets with most of the literature concentrating on the production of quantitative scientific evidence on sustainable diet metrics through the use of diet modelling. Papers which did discuss policy were largely focused on evaluating past policies on sustainable diets or analysing potential policy options using criteria based approaches as distinct from examining how the policy process operates in this area. While a small number of papers were identified that did include some discussion of key influences on policy making that are commonly included within theories of the policy process, no papers deliberately applied a theory of the policy process as far as we could tell. Without the application of such theories studies are limited in their ability to explain a lack of policy action or to recommend strategies and leverage points which would help achieve future policy change. Policy action to shift consumers towards more sustainable diets is urgently needed to help mitigate climate change and other environmental impacts. Given the lack of meaningful policies in this area worldwide we recommend more research which utilised robust theories of the policy process to help explain this lack of policy action and help suggest ways for increased attention and policy implementation by decision makers.

Declarations

Acknowledgements

Not applicable

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Availability of data and materials

Not applicable.

Competing interests

None.

Funding

None.

Authors' contributions

CG, GC and AJ contributed to the study conception and design. CG conducted the systematic review, prepared all figures and tables and wrote the main manuscript text. GC and AJ provided guidance on carrying out the systematic review, reviewed the manuscript and added minor adjustments and made comments for improvements during drafting of the paper.

Author details

¹Centre for Social Impact

University of New South Wales
704, Level 7, Science Engineering Building
UNSW Sydney
NSW 2052

Australia

² Centre for Social Impact

Swinburne University of Technology

References

1. Aleksandrowicz, L., Green, R., Joy, E. J. M., Smith, P., & Haines, A. (2016). The Impacts of Dietary Change on Greenhouse Gas Emissions, Land Use, Water Use, and Health: A Systematic Review. *PLOS ONE*, 11(11), e0165797. <https://doi.org/10.1371/journal.pone.0165797>
2. Annunziata, A., Agovino, M., & Mariani, A. (2019). Sustainability of Italian families' food practices: Mediterranean diet adherence combined with organic and local food consumption. *Journal of Cleaner Production*, 206, 86–96. <https://doi.org/10.1016/j.jclepro.2018.09.155>
3. Annunziata, A., Mariani, A., & Vecchio, R. (2019). Effectiveness of sustainability labels in guiding food choices: Analysis of visibility and understanding among young adults. *Sustainable Production and Consumption*, 17, 108–115. <https://doi.org/10.1016/j.spc.2018.09.005>
4. Annunziata, A., & Scarpato, D. (2014). Factors affecting consumer attitudes towards food products with sustainable attributes. *Agricultural Economics*, 60(8), 353–363.
5. Audsley, E., Brander, M., Chatterton, J. C., Murphy-Bokern, D., Webster, C., & Williams, A. G. (2010). *How low can we go? An assessment of greenhouse gas emissions from the UK food system and the scope reduction by 2050. Report for the WWF and Food Climate Research Network* [Report]. <https://dspace.lib.cranfield.ac.uk/handle/1826/6503>
6. Bailey, R., Froggatt, A., & Wellesley, L. (2014). *Livestock—Climate change's forgotten sector: Global public opinion on meat and dairy consumption*. Chatham House, the Royal Institute of International Affairs.
7. Barling, D., Lang, T., & Caraher, M. (2002). Joined-up Food Policy? The Trials of Governance, Public Policy and the Food System. *Social Policy & Administration*, 36(6), 556–574. <https://doi.org/10.1111/1467-9515.t01-1-00304>
8. Barone, B., Nogueira, R. M., Guimarães, K. R. L. S. L. de Q., & Behrens, J. H. (2018). Sustainable diet from the urban Brazilian consumer perspective. *Food Research International*. <https://doi.org/10.1016/j.foodres.2018.05.027>
9. Batlle-Bayer, L., Bala, A., García-Herrero, I., Lemaire, E., Song, G., Aldaco, R., & Fullana-i-Palmer, P. (2019). The Spanish Dietary Guidelines: A potential tool to reduce greenhouse gas emissions of current dietary patterns. *Journal of Cleaner Production*, 213, 588–598. <https://doi.org/10.1016/j.jclepro.2018.12.215>
10. Baumgartner, F. R., Jones, B. D., & Mortensen, P. B. (2014). Punctuated equilibrium theory: Explaining stability and change in public policymaking. In P. A. Sabatier & C. M. Weible (Eds.), *Theories of the policy process* (3rd ed., pp. 59–103). Westview Press.

11. Benedetti, I., Laureti, T., & Secondi, L. (2018). Choosing a healthy and sustainable diet: A three-level approach for understanding the drivers of the Italians' dietary regime over time. *Appetite*, 123, 357–366. <https://doi.org/10.1016/j.appet.2018.01.004>
12. Beverland, M. B. (2014). Sustainable Eating: Mainstreaming Plant-Based Diets In Developed Economies. *Journal of Macromarketing*, 7–10. <https://doi.org/10.1177/0276146714526410>
13. Bonnet, C., Bouamra-Mechemache, Z., & Corre, T. (2018). An Environmental Tax Towards More Sustainable Food: Empirical Evidence of the Consumption of Animal Products in France. *Ecological Economics*, 147, 48–61. <https://doi.org/10.1016/j.ecolecon.2017.12.032>
14. Bovens, M., Hart, P. 't, & Kuipers, S. (2008). The Politics of Policy Evaluation. In R. Goodin, P. 't Hart, & M. Rein (Eds.), *The Oxford Handbook of Public Policy*. <https://doi.org/10.1093/oxfordhb/9780199548453.003.0015>
15. Breton, E., & de Leeuw, E. (2011). Theories of the policy process in health promotion research: A review. *Health Promotion International*, 26(1), 82–90. <https://doi.org/10.1093/heapro/daq051>
16. Breton, E., Richard, L., Gagnon, F., Jacques, M., & Bergeron, P. (2008). Health promotion research and practice require sound policy analysis models: The case of Quebec's Tobacco Act. *Social Science & Medicine*, 67(11), 1679–1689. <https://doi.org/10.1016/j.socscimed.2008.07.028>
17. Briggs, A. D. M., Kehlbacher, A., Tiffin, R., Garnett, T., Rayner, M., & Scarborough, P. (2013). Assessing the impact on chronic disease of incorporating the societal cost of greenhouse gases into the price of food: An econometric and comparative risk assessment modelling study. *BMJ Open*, 3(10), e003543. <https://doi.org/10.1136/bmjopen-2013-003543>
18. Bristow, E., & Fitzgerald, A. (2011). Global Climate Change and the Industrial Animal Agriculture Link: The Construction of Risk. *Society & Animals*, 19(3), 205–224. <https://doi.org/10.1163/156853011X578893>
19. Bryant, T. (2013). Policy Change and the Social Determinants of Health. In C. Clavier & E. de Leeuw (Eds.), *Health promotion and the policy process*. Oxford University Press.
20. Cairney, P. (2011). *Understanding Public Policy: Theories and Issues* (2011 edition). Palgrave.
21. Cairney, P. (2016). *The Politics of Evidence-Based Policy Making* (1st ed. 2016 edition). Palgrave Pivot.
22. Cairney, P. (2018, April). *Three habits of successful policy entrepreneurs* [Text]. <https://doi.org/info:doi/10.1332/030557318X15230056771696>
23. Cairney, P. (2019, February 3). Policy Concepts in 1000 Words: The Institutional Analysis and Development Framework (IAD) and Governing the Commons. *Paul Cairney: Politics & Public Policy*. <https://paulcairney.wordpress.com/2019/02/03/policy-concepts-in-1000-words-the-institutional-analysis-and-development-framework-iad-and-governing-the-commons/>
24. Cairney, P., & Heikkila, T. (2014). A comparison of theories of the policy process. In P. A. Sabatier & C. M. Weible (Eds.), *Theories of the Policy Process* (3rd Ed, pp. 363–390). Westview Press.
25. Cairney, P., & Oliver, K. (2017). Evidence-based policymaking is not like evidence-based medicine, so how far should you go to bridge the divide between evidence and policy? *Health Research Policy and Systems*, 15. <https://doi.org/10.1186/s12961-017-0192-x>

26. Cairney, P., Oliver, K., & Wellstead, A. (2016). To Bridge the Divide between Evidence and Policy: Reduce Ambiguity as Much as Uncertainty. *Public Administration Review*, 76(3), 399–402.
<https://doi.org/10.1111/puar.12555>
27. Campbell-Arvai, V. (2015). Food-related environmental beliefs and behaviours among university undergraduates: A mixed-methods study. *International Journal of Sustainability in Higher Education*, 16(3), 279–295. <https://doi.org/10.1108/IJSHE-06-2013-0071>
28. Carlsson-Kanyama, A., & González, A. D. (2009). Potential contributions of food consumption patterns to climate change. *The American Journal of Clinical Nutrition*, 89(5), 1704S-1709S.
<https://doi.org/10.3945/ajcn.2009.26736AA>
29. Cavaliere, A., De Marchi, E., & Banterle, A. (2018). Exploring the Adherence to the Mediterranean Diet and Its Relationship with Individual Lifestyle: The Role of Healthy Behaviors, Pro-Environmental Behaviors, Income, and Education. *Nutrients*, 10(2), 141. <https://doi.org/10.3390/nu10020141>
30. Clarke, B., Swinburn, B., & Sacks, G. (2016). The application of theories of the policy process to obesity prevention: A systematic review and meta-synthesis. *BMC Public Health*, 16, 1084.
<https://doi.org/10.1186/s12889-016-3639-z>
31. Clavier, C., & de Leeuw, E. (Eds.). (2013a). *Health Promotion and The Policy Process*. Oxford University Press.
32. Clavier, C., & de Leeuw, E. (2013b). Framing public policy in health promotion: Ubiquitous, yet elusive. In C. Clavier & E. de Leeuw (Eds.), *Health promotion and the policy process*. Oxford University Press.
<http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199658039.001.0001/acprof-9780199658039>
33. Clonan, A., & Holdsworth, M. (2012). The challenges of eating a healthy and sustainable diet. *The American Journal of Clinical Nutrition*, 96(3), 459–460. <https://doi.org/10.3945/ajcn.112.044487>
34. Curry, R., Crawley, E., & Baird, J. (2015). Values and decisions on sustainable food choices when eating out. *Proceedings of the Institution of Civil Engineers - Waste and Resource Management*, 168(2), 87–98. <https://doi.org/10.1680/warm.13.00033>
35. Dagevos, H., & Voordouw, J. (2013). Sustainability and meat consumption: Is reduction realistic. *Sustainability: Science, Practice, & Policy*, 9(2), 60–69.
36. de Bakker, E., & Dagevos, H. (2012). Reducing Meat Consumption in Today's Consumer Society: Questioning the Citizen-Consumer Gap. *Journal of Agricultural and Environmental Ethics*, 25(6), 877–894. <https://doi.org/10.1007/s10806-011-9345-z>
37. de Leeuw, E. de, & Breton, E. (2013). Policy change theories in health promotion research: A review. In C. Clavier & E. de Leeuw (Eds.), *Health promotion and the policy process*. Oxford University Press.
38. Deckers, J. (2013). Obesity, public health, and the consumption of animal products. *Journal of Bioethical Inquiry*, 10(1), 29–38. <https://doi.org/10.1007/s11673-012-9411-x>
39. Denniss, E., Woods, J., & Lawrence, M. (2021). Promoting healthy and sustainable diets: Barriers and enablers for successful policy activities in Australia. *Health Promotion International*, daab013.
<https://doi.org/10.1093/heapro/daab013>

40. Dixon, J., & Isaacs, B. (2013). Why sustainable and 'nutritionally correct' food is not on the agenda: Western Sydney, the moral arts of everyday life and public policy. *Food Policy*, 43, 67–76. <https://doi.org/10.1016/j.foodpol.2013.08.010>
41. Downs, S. M., Payne, A., & Fanzo, J. (2017). The development and application of a sustainable diets framework for policy analysis: A case study of Nepal. *Food Policy*, 70, 40–49. <https://doi.org/10.1016/j.foodpol.2017.05.005>
42. Dubnick, M., & Bardes, B. (1983). Thinking about public policy, a problem-solving approach. *Political Science Scholarship*. https://scholars.unh.edu/polisci_facpub/63
43. Embrett, M. G., & Randall, G. E. (2014). Social determinants of health and health equity policy research: Exploring the use, misuse, and nonuse of policy analysis theory. *Social Science & Medicine*, 108, 147–155. <https://doi.org/10.1016/j.socscimed.2014.03.004>
44. Fafard, P. (2015). Beyond the usual suspects: Using political science to enhance public health policy making. *Journal of Epidemiology and Community Health*, 69(11), 1129. <http://dx.doi.org.ezproxy.lib.swin.edu.au/10.1136/jech-2014-204608>
45. Farchi, S., De Sario, M., Lapucci, E., Davoli, M., & Michelozzi, P. (2017). Meat consumption reduction in Italian regions: Health co-benefits and decreases in GHG emissions. *PLoS One; San Francisco*, 12(8), e0182960. <http://dx.doi.org.ezproxy.lib.swin.edu.au/10.1371/journal.pone.0182960>
46. Finley, J. W., Dimick, D., Marshall, E., Nelson, G. C., Mein, J. R., & Gustafson, D. I. (2017). Nutritional Sustainability: Aligning Priorities in Nutrition and Public Health with Agricultural Production. *Advances in Nutrition (Bethesda, Md.)*, 8(5), 780–788. <https://doi.org/10.3945/an.116.013995>
47. Frenette, E., Bahn, O., & Vaillancourt, K. (2017). Meat, Dairy and Climate Change: Assessing the Long-Term Mitigation Potential of Alternative Agri-Food Consumption Patterns in Canada. *Environmental Modeling & Assessment; Dordrecht*, 22(1), 1–16. <http://dx.doi.org.ezproxy.lib.swin.edu.au/10.1007/s10666-016-9522-6>
48. Friel, S., Barosh, L. J., & Lawrence, M. (2014). Towards healthy and sustainable food consumption: An Australian case study. *Public Health Nutrition*, 17(5), 1156–1166. <https://doi.org/10.1017/S1368980013001523>
49. Friel, S., Dangour, A. D., Garnett, T., Lock, K., Chalabi, Z., Roberts, I., Butler, A., Butler, C. D., Waage, J., McMichael, A. J., & Haines, A. (2009). Public health benefits of strategies to reduce greenhouse-gas emissions: Food and agriculture. *The Lancet*, 374(9706), 2016–2025. [https://doi.org/10.1016/S0140-6736\(09\)61753-0](https://doi.org/10.1016/S0140-6736(09)61753-0)
50. Garnett, T. (2011). Where are the best opportunities for reducing greenhouse gas emissions in the food system (including the food chain)? *Food Policy*, 36, Supplement 1, S23–S32. <https://doi.org/10.1016/j.foodpol.2010.10.010>
51. Garnett, T. (2013). Food sustainability: Problems, perspectives and solutions. *The Proceedings of the Nutrition Society*, 72(1), 29–39. <http://dx.doi.org/10.1017/S0029665112002947>
52. Garnett, T. (2014). *Changing what we eat: A call for research & action on widespread adoption of sustainable healthy eating*. Food Climate Research Network.

- http://www.fcrn.org.uk/sites/default/files/fcrn_wellcome_gfs_changing_consumption_report_final.pdf
53. Garnett, T., Mathewson, S., Angelides, P., & Borthwick, F. (2015). *Policies and actions to shift eating patterns: What works?* Food Climate Research Network and Chatham House.
 54. Gerber, P. J., Steinfeld, H., Henderson, B., Mottet, A., Opio, C., Dijkman, J., Falcucci, A., & Tempio, G. (2013). *Tackling climate change through livestock: A global assessment of emissions and mitigation opportunities*. xxi + 115 pp. CABDirect2.
 55. Gussow, J. D., & Clancy, K. L. (1986). Dietary guidelines for sustainability. *Journal of Nutrition Education*, 18(1), 1–5. [https://doi.org/10.1016/S0022-3182\(86\)80255-2](https://doi.org/10.1016/S0022-3182(86)80255-2)
 56. Hallström, E., Carlsson-Kanyama, A., & Börjesson, P. (2015). Environmental impact of dietary change: A systematic review. *Journal of Cleaner Production*, 91, 1–11. <https://doi.org/10.1016/j.jclepro.2014.12.008>
 57. Hallström, E., Gee, Q., Scarborough, P., & Cleveland, D. A. (2017). A healthier US diet could reduce greenhouse gas emissions from both the food and health care systems. *Climatic Change; Dordrecht*, 142(1–2), 199–212. <http://dx.doi.org.ezproxy.lib.swin.edu.au/10.1007/s10584-017-1912-5>
 58. Hedenus, F., Wirsenius, S., & Johansson, D. J. A. (2014). The importance of reduced meat and dairy consumption for meeting stringent climate change targets. *Climatic Change*, 124(1–2), 79–91. <https://doi.org/10.1007/s10584-014-1104-5>
 59. Henstra, D. (2010). Explaining local policy choices: A Multiple Streams analysis of municipal emergency management. *Canadian Public Administration*, 53(2), 241–258. <https://doi.org/10.1111/j.1754-7121.2010.00128.x>
 60. Hyland, J. J., Henchion, M., McCarthy, M., & McCarthy, S. N. (2017). The climatic impact of food consumption in a representative sample of Irish adults and implications for food and nutrition policy. *Public Health Nutrition; Cambridge*, 20(4), 726–738. <http://dx.doi.org.ezproxy.lib.swin.edu.au/10.1017/S1368980016002573>
 61. IPCC. (2014). Summary for policymakers. In C. Field, V. Barros, D. Dokken, K. Mach, M. Mastrandrea, T. Bilir, M. Chatterjee, K. Ebi, & L. White (Eds.), *Climate change 2014: Impacts, adaptation, and vulnerability. Part A: Global and sectoral aspects* (pp. 1–32). Cambridge University Press.
 62. Irz, X., Jensen, J. D., Leroy, P., Réquillart, V., & Soler, L.-G. (2019). Promoting climate-friendly diets: What should we tell consumers in Denmark, Finland and France? *Environmental Science & Policy*, 99, 169–177. <https://doi.org/10.1016/j.envsci.2019.05.006>
 63. James, S. (2015, November 24). *Policy and action to support healthy and sustainable food behaviours*.
 64. James, S. W., Friel, S., Lawrence, M. A., Hoek, A. C., & Pearson, D. (2017). Inter-sectoral action to support healthy and environmentally sustainable food behaviours: A study of sectoral knowledge, governance and implementation opportunities. *Sustainability Science*, 1–13. <https://doi.org/10.1007/s11625-017-0459-8>
 65. James, T. E., & Jorgensen, P. D. (2009). Policy Knowledge, Policy Formulation, and Change: Revisiting a Foundational Question. *Policy Studies Journal*, 37(1), 141–162. <https://doi.org/10.1111/j.1541-0072.2008.00300.x>

66. Jelsøe, E. (2015). Dietary Guidelines: Nutritional Health Communication versus Sustainable Food Policy. *Journal of Transdisciplinary Environmental Studies*, 14(2), 36–51.
67. Jenkins-Smith, H. C., Nohrstedt, D., Weible, C. M., & Sabatier, P. A. (2014). The Advocacy Coalition Framework: Foundations, evolution, and ongoing research. In *Theories of the Policy Process* (3rd ed.). Westview Press.
68. Johnston, J. L., Fanzo, J. C., & Cogill, B. (2014). Understanding Sustainable Diets: A Descriptive Analysis of the Determinants and Processes That Influence Diets and Their Impact on Health, Food Security, and Environmental Sustainability. *Advances in Nutrition: An International Review Journal*, 5(4), 418–429. <https://doi.org/10.3945/an.113.005553>
69. Joyce, A., Hallett, J., Hannelly, T., & Carey, G. (2014). The impact of nutritional choices on global warming and policy implications: Examining the link between dietary choices and greenhouse gas emissions. *Energy and Emission Control Technologies*, 33. <https://doi.org/10.2147/EECT.S58518>
70. Kevany, K. M., Baur, G., & Wang, G. C. (2018). Shifting Food Systems: Increasing Well-Being Through Plant-Based Approaches. *EXPLORE*, 14(6), 435–442. <https://doi.org/10.1016/j.explore.2018.04.012>
71. Kingdon, J. (1995). *Agendas, alternatives, and public policies* (2nd ed.). Harper Collins.
72. Kingdon, J. W. (1995). *Agendas, alternatives, and public policies* (2nd ed.). Longman.
73. Klein, R., & Marmor, T. (2008). Reflections on policy analysis: Putting it together again. In M. Moran, M. Reid, & R. Goodin (Eds.), *The Oxford Handbook of Public Policy* (pp. 892–911). Oxford University Press.
74. Laestadius, L. I., Neff, R. A., Barry, C. L., & Frattaroli, S. (2013). Meat consumption and climate change: The role of non-governmental organizations. *Climatic Change*, 120(1–2), 25–38. <http://dx.doi.org/10.1007/s10584-013-0807-3>
75. Laestadius, L. I., Neff, R. A., Barry, C. L., & Frattaroli, S. (2014a). “We don’t tell people what to do”: An examination of the factors influencing NGO decisions to campaign for reduced meat consumption in light of climate change. *Global Environmental Change*, 29, 32–40. <https://doi.org/10.1016/j.gloenvcha.2014.08.001>
76. Laestadius, L. I., Neff, R. A., Barry, C. L., & Frattaroli, S. (2014b). No Meat, Less Meat, or Better Meat: Understanding NGO Messaging Choices Intended to Alter Meat Consumption in Light of Climate Change. *Environmental Communication*, 0(0), 1–20. <https://doi.org/10.1080/17524032.2014.981561>
77. Lafranconi, A., & Birt, C. A. (2017). ‘Du bist was du isst’: Challenges in European nutrition policy. *European Journal of Public Health*, 27(suppl_4), 26–31. <https://doi.org/10.1093/eurpub/ckx162>
78. Lang, T., & Barling, D. (2013). Nutrition and sustainability: An emerging food policy discourse. *Proceedings of the Nutrition Society*, 72(01), 1–12. <https://doi.org/10.1017/S002966511200290X>
79. Lang, T., & Mason, P. (2017). Sustainable diet policy development: Implications of multi-criteria and other approaches, 2008–2017. *Proceedings of the Nutrition Society*, 1–16. <https://doi.org/10.1017/S0029665117004074>
80. Larsson, S. C., & Wolk, A. (2006). Meat consumption and risk of colorectal cancer: A meta-analysis of prospective studies. *International Journal of Cancer. Journal International Du Cancer*, 119(11), 2657–

2664. <https://doi.org/10.1002/ijc.22170>
81. Lasswell, H. D. (1971). *A Pre-view of Policy Sciences*. American Elsevier Publishing Company.
82. Lawrence, M. A., Friel, S., Wingrove, K., James, S. W., & Candy, S. (2015). Formulating policy activities to promote healthy and sustainable diets. *Public Health Nutrition*, 18(13), 2333–2340. <https://doi.org/10.1017/S1368980015002529>
83. Lerner, H., Algers, B., Gunnarsson, S., & Nordgren, A. (2013). Stakeholders on meat production, meat consumption and mitigation of climate change: Sweden as a case. *Journal of Agricultural and Environmental Ethics*, 26(3), 663–678. <https://doi.org/10.1007/s10806-012-9420-0>
84. Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P. A., Clarke, M., Devereaux, P. J., Kleijnen, J., & Moher, D. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: Explanation and elaboration. *Journal of Clinical Epidemiology; Elmsford*, 62(10), e1-34. <http://dx.doi.org.ezproxy.lib.swin.edu.au/10.1016/j.jclinepi.2009.06.006>
85. Lowe, M. (2014). Obesity and climate change mitigation in Australia: Overview and analysis of policies with co-benefits. *Australian & New Zealand Journal of Public Health*, 38(1), 19–24. <https://doi.org/10.1111/1753-6405.12150>
86. Macdiarmid, J. I. (2013). Is a healthy diet an environmentally sustainable diet? *Proceedings of the Nutrition Society*, 72(1), 13–20. <https://doi.org/10.1017/S0029665112002893>
87. Mahoney, J., & Thelan, K. (2010). *Explaining Institutional Change: Ambiguity, Agency and Power*. Cambridge University Press.
88. Martin, M., & Danielsson, L. (2016). Environmental Implications of Dynamic Policies on Food Consumption and Waste Handling in the European Union. *Sustainability*, 8(3), 282. <https://doi.org/10.3390/su8030282>
89. McAlpine, C. A., Etter, A., Fearnside, P. M., Seabrook, L., & Laurance, W. F. (2009). *Increasing world consumption of beef as a driver of regional and global change: A call for policy action based on evidence from Queensland (Australia), Colombia and Brazil*. <https://doi.org/10.1016/j.gloenvcha.2008.10.008>
90. McBeth, M., Jones, M., & Shanahan, E. (2014). The Narrative Policy Framework. In P. A. Sabatier & C. M. Weible (Eds.), *Theories of the Policy Process* (3rd ed, pp. 225–266). Westview Press.
91. McMichael, A. J., Powles, J. W., Butler, C. D., & Uauy, R. (2007a). Food, livestock production, energy, climate change, and health. *The Lancet*, 370(9594), 1253–1263. [https://doi.org/10.1016/S0140-6736\(07\)61256-2](https://doi.org/10.1016/S0140-6736(07)61256-2)
92. McMichael, A. J., Powles, J. W., Butler, C. D., & Uauy, R. (2007b). Food, livestock production, energy, climate change, and health. *The Lancet*, 370(9594), 1253–1263. [https://doi.org/10.1016/S0140-6736\(07\)61256-2](https://doi.org/10.1016/S0140-6736(07)61256-2)
93. Michaelowa, A., & Dransfeld, B. (2008). Greenhouse gas benefits of fighting obesity. *Ecological Economics*, 66(2), 298–308. <https://doi.org/10.1016/j.ecolecon.2007.09.004>

94. Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Group, T. P. (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLOS Medicine*, 6(7), e1000097. <https://doi.org/10.1371/journal.pmed.1000097>
95. Nowlin, M. C. (2011). Theories of the Policy Process: State of the Research and Emerging Trends. *Policy Studies Journal*, 39, 41–60. https://doi.org/10.1111/j.1541-0072.2010.00389_4.x
96. Oshiro, J., Adyatni, I., O'Connor, L., & Savaiano, D. (2018). Sustainable Eating Patterns Should Be Part of the Dietary Guidelines for Americans. *Nutrition Today*, 53(2), 79–84. <https://doi.org/10.1097/NT.0000000000000266>
97. Ostrom, E., Cox, M., & Schlager, E. (2014). An assessment of the institutional analysis and development framework and introduction of the social-ecological systems framework. In P. A. Sabatier & C. M. Weible (Eds.), *Theories of the policy process* (3rd ed, pp. 267–306). Westview Press.
98. Pathak, H., Jain, N., Bhatia, A., Patel, J., & Aggarwal, P. K. (2010). Carbon footprints of Indian food items. *Agriculture, Ecosystems & Environment*, 139(1–2), 66–73. <https://doi.org/10.1016/j.agee.2010.07.002>
99. Quam, V. G. M., Rocklöv, J., Quam, M. B. M., & Lucas, R. A. I. (2017). Assessing Greenhouse Gas Emissions and Health Co-Benefits: A Structured Review of Lifestyle-Related Climate Change Mitigation Strategies. *International Journal of Environmental Research and Public Health*, 14(5). <https://doi.org/10.3390/ijerph14050468>
100. Reisch, L. A., Eberle, U., & Lorek, S. (2013). Sustainable food consumption: An overview of contemporary issues and policies. *Sustainability: Science, Practice and Policy*, 9(2), 7.
101. Rickards, L., Wiseman, J., & Kashima, Y. (2014). Barriers to effective climate change mitigation: The case of senior government and business decision makers. *Wiley Interdisciplinary Reviews: Climate Change*, 5(6), 753–773. <https://doi.org/10.1002/wcc.305>
102. Ridgway, E. M., Lawrence, M. A., & Woods, J. (2015). Integrating Environmental Sustainability Considerations into Food and Nutrition Policies: Insights from Australia's National Food Plan. *Frontiers in Nutrition*, 2. <https://doi.org/10.3389/fnut.2015.00029>
103. Ripple, W. J., Smith, P., Haberl, H., Montzka, S. A., McAlpine, C., & Boucher, D. H. (2014). Ruminants, climate change and climate policy. *Nature Climate Change*, 4(1), 2–5. <https://doi.org/10.1038/nclimate2081>
104. Rose, D., Vance, C., & Lopez, M. A. (2021). Livestock Industry Practices that Impact Sustainable Diets in the United States. *The International Journal of Sociology of Agriculture and Food*, 27(1), Article 1. <https://doi.org/10.48416/ijisaf.v27i1.87>
105. Sabatier, P. A. (Ed.). (2007). *Theories of the Policy Process, Second Edition* (2nd edition). Westview Press.
106. Santaoja, M., & Jauho, M. (2020). Institutional Ambiguity and Ontological Politics in Integrating Sustainability into Finnish Dietary Guidelines. *Sustainability*, 12(13), 5330. <https://doi.org/10.3390/su12135330>

107. Saxe, H., Larsen, T. M., & Mogensen, L. (2012). The global warming potential of two healthy Nordic diets compared with the average Danish diet. *Climatic Change*, 116(2), 249–262.
<https://doi.org/10.1007/s10584-012-0495-4>
108. Scarborough, P., Appleby, P. N., Mizdrak, A., Briggs, A. D., M, Travis, R. C., Bradbury, K. E., & Key, T. J. (2014). Dietary greenhouse gas emissions of meat-eaters, fish-eaters, vegetarians and vegans in the UK. *Climatic Change*, 125(2), 179–192. <http://dx.doi.org/10.1007/s10584-014-1169-1>
109. Sedlacko, M., Pisano, U., Berger, G., & Lepuschitz, K. (2013). Bridging the science-policy gap: Development and reception of a joint research agenda on sustainable food consumption. *Sustainability: Science, Practice and Policy*, 9(2), 105–123.
110. Sedlacko, M., Reisch, L., & Scholl, G. (2013). Sustainable food consumption: When evidence-based policy making meets policy-minded research—Introduction to the special issue. *Sustainability: Science, Practice and Policy*, 9(2), 1–6.
111. Seed, B. (2015). Sustainability in the Qatar national dietary guidelines, among the first to incorporate sustainability principles. *Public Health Nutrition; Cambridge*, 18(13), 2303–2310.
<http://dx.doi.org.ezproxy.lib.swin.edu.au/10.1017/S1368980014002110>
112. Simmonds, P., & Vallgård, S. (2021). “It’s not as simple as something like sugar”: Values and conflict in the UK meat tax debate. *International Journal of Health Governance*, 26(3), 307–322.
<https://doi.org/10.1108/IJHG-03-2021-0026>
113. Singh, N. N., Lancioni, G. E., Winton, A. S. W., Karazsia, B. T., Singh, A. D. A., Singh, A. N. A., & Singh, J. (2013). A Mindfulness-Based Smoking Cessation Program for Individuals with Mild Intellectual Disability. *Mindfulness*, 4(2), 148–157. <https://doi.org/10.1007/s12671-012-0148-8>
114. Smith, J., Lang, T., Vorley, B., & Barling, D. (2016). Addressing Policy Challenges for More Sustainable Local–Global Food Chains: Policy Frameworks and Possible Food “Futures.” *Sustainability*, 8(4), 299.
<https://doi.org/10.3390/su8040299>
115. Smith, K. B., & Larimer, C. (2016). *The Public Policy Theory Primer* (3rd edition). Routledge.
116. Smith, P., Martino, D., Cai, Z., Gwary, D., Janzen, H., Kumar, P., McCarle, B., Ogle, S., O’Mara, F., Rice, C., Scholes, B., & Sirotenko, O. (2007). Agriculture. In B. Metz, O. Davidson, P. Bosch, R. Dave, & L. Meyer (Eds.), *Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press.
117. Soret, S., Mejia, A., Batech, M., Jaceldo-Siegl, K., Harwatt, H., & Sabaté, J. (2014). Climate change mitigation and health effects of varied dietary patterns in real-life settings throughout North America. *The American Journal of Clinical Nutrition*, 100(Supplement 1), 490S–495S.
<https://doi.org/10.3945/ajcn.113.071589>
118. Springmann, M., Mason-d’croz, D., Robinson, S., Wiebe, K., Godfray, H. C. J., Rayner, M., & Scarborough, P. (2017). Mitigation potential and global health impacts from emissions pricing of food commodities. *Nature Climate Change; London*, 7(1), 69–74.
<http://dx.doi.org.ezproxy.lib.swin.edu.au/10.1038/nclimate3155>

119. Stehfest, E., Bouwman, L., Vuuren, D. P. van, Elzen, M. G. J. den, Eickhout, B., & Kabat, P. (2009). Climate benefits of changing diet. *Climatic Change*, 95(1–2), 83–102.
<https://doi.org/10.1007/s10584-008-9534-6>
120. Steinfeld, H., Gerber, P., Wassenaar, T., Castel, V., Rosales, M., & de Haan, C. (2006). *Livestock's long shadow: Environmental issues and options*. Food and Agriculture Organization of the United Nations.
<http://www.fao.org/docrep/010/a0701e/a0701e00.HTM>
121. Sulda, H., Coveney, J., & Bentley, M. (2010). An investigation of the ways in which public health nutrition policy and practices can address climate change. *Public Health Nutrition*, 13(3), 304–313.
<https://doi.org/10.1017/S1368980009990334>
122. Tilman, D., & Clark, M. (2014). Global diets link environmental sustainability and human health. *Nature*, 515(7528), 518–522. <https://doi.org/10.1038/nature13959>
123. Ulaszewska, M. M., Luzzani, G., Pignatelli, S., & Capri, E. (2017). Assessment of diet-related GHG emissions using the environmental hourglass approach for the Mediterranean and new Nordic diets. *Science of The Total Environment*, 574, 829–836. <https://doi.org/10.1016/j.scitotenv.2016.09.039>
124. VanLandingham, G., & Silloway, T. (2016). Bridging the Gap between Evidence and Policy Makers: A Case Study of the Pew-MacArthur Results First Initiative. *Public Administration Review*, 76(4), 542–546. <https://doi.org/10.1111/puar.12603>
125. Vázquez-Rowe, I., Larrea-Gallegos, G., Villanueva-Rey, P., & Gilardino, A. (2017). Climate change mitigation opportunities based on carbon footprint estimates of dietary patterns in Peru. *PLoS One; San Francisco*, 12(11), e0188182.
<http://dx.doi.org.ezproxy.lib.swin.edu.au/10.1371/journal.pone.0188182>
126. Vermeulen, S. J., Campbell, B. M., & Ingram, J. S. I. (2012). Climate Change and Food Systems. *Annual Review of Environment and Resources*, 37(1), 195–222. <https://doi.org/10.1146/annurev-environ-020411-130608>
127. Walia, B., & Sanders, S. (2019). Curbing food waste: A review of recent policy and action in the USA. *Renewable Agriculture and Food Systems*, 34(2), 169–177.
<https://doi.org/10.1017/S1742170517000400>
128. Wang, H., & Horton, R. (2015). Tackling climate change: The greatest opportunity for global health. *The Lancet*. [https://doi.org/10.1016/S0140-6736\(15\)60931-X](https://doi.org/10.1016/S0140-6736(15)60931-X)
129. Weber, C. L., & Matthews, H. S. (2008). Food-miles and the relative climate impacts of food choices in the United States. *Environmental Science & Technology*, 42(10), 3508–3513.
130. Weible, C. M. (2014). Introducing the scope and focus of policy process research and theory. In P. A. Sabatier & C. M. Weible (Eds.), *Theories of the Policy Process* (3rd ed.). Westview Press.
131. Weimer, D. L. (2008). Theories of and in the Policy Process. *Policy Studies Journal*, 36(4), 489–495.
<http://dx.doi.org.wwwproxy1.library.unsw.edu.au/10.1111/j.1541-0072.2008.00280.x>
132. Weis, T. (2015). Meatification and the madness of the doubling narrative. *Canadian Food Studies / La Revue Canadienne Des Études Sur l'alimentation*, 2(2), 296–303.

133. Whitmee, S., Haines, A., Beyrer, C., Boltz, F., Capon, A. G., de Souza Dias, B. F., Ezeh, A., Frumkin, H., Gong, P., Head, P., Horton, R., Mace, G. M., Marten, R., Myers, S. S., Nishtar, S., Osofsky, S. A., Pattanayak, S. K., Pongsiri, M. J., Romanelli, C., ... Yach, D. (2015). Safeguarding human health in the Anthropocene epoch: Report of The Rockefeller Foundation-Lancet Commission on planetary health. *Lancet (London, England)*, 386(10007), 1973–2028. [https://doi.org/10.1016/S0140-6736\(15\)60901-1](https://doi.org/10.1016/S0140-6736(15)60901-1)
134. WHO/FAO. (2003). *Diet, Nutrition and the Prevention of Chronic Diseases: Report of a Joint WHO/FAO Expert Consultation*. Geneva World Health Organization.
135. Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., Garnett, T., Tilman, D., DeClerck, F., Wood, A., Jonell, M., Clark, M., Gordon, L. J., Fanzo, J., Hawkes, C., Zurayk, R., Rivera, J. A., De Vries, W., Majele Sibanda, L., ... Murray, C. J. L. (2019). Food in the Anthropocene: The EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet*, 393(10170), 447–492. [https://doi.org/10.1016/S0140-6736\(18\)31788-4](https://doi.org/10.1016/S0140-6736(18)31788-4)
136. Wilson, N., Nghiem, N., Ni Mhurchu, C., Eyles, H., Baker, M. G., & Blakely, T. (2013). Foods and dietary patterns that are healthy, low-cost, and environmentally sustainable: A case study of optimization modeling for New Zealand. *PloS One*, 8(3), e59648. <https://doi.org/10.1371/journal.pone.0059648>
137. Workman, S., Jones, B. D., & Jochim, A. E. (2009). Information Processing and Policy Dynamics. *Policy Studies Journal*, 37(1), 75–92. <https://doi.org/10.1111/j.1541-0072.2008.00296.x>
138. Zahariadis, N. (2014). Ambiguity and multiple streams. In P. A. Sabatier & C. M. Weible (Eds.), *Theories of the Policy Process* (3rd ed.). Westview Press.

Figures

Figure 1

PRISMA flow diagram

Figure 2

Sustainable diet themes

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Appendix1.docx](#)
- [Appendix2.docx](#)