

Reducing Meat Consumption in Today's Consumer Society: Questioning the Citizen-Consumer Gap

Erik de Bakker · Hans Dagevos

Accepted: 12 September 2011 / Published online: 25 September 2011

© The Author(s) 2011. This article is published with open access at Springerlink.com

Abstract Our growing demand for meat and dairy food products is unsustainable. It is hard to imagine that this global issue can be solved solely by more efficient technologies. Lowering our meat consumption seems inescapable. Yet, the question is whether modern consumers can be considered as reliable allies to achieve this shift in meat consumption pattern. Is there not a yawning gap between our responsible intentions as citizens and our hedonic desires as consumers? We will argue that consumers can and should be considered as partners that must be involved in realizing new ways of protein consumption that contribute to a more sustainable world. In particular the large food consumer group of flexitarians offer promising opportunities for transforming our meat consumption patterns. We propose a pragmatic approach that explicitly goes beyond the standard suggestion of persuasion strategies and suggests different routes of change, coined sustainability by stealth, moderate involvement, and cultural change respectively. The recognition of more routes of change to a more plant-based diet implies that the ethical debate on meat should not only associate consumer change with rational persuasion strategies and food citizens that instantiate “strong” sustainable consumption. Such a focus narrows the debate on sustainable protein consumption and easily results in disappointment about consumers’ participation. A more wide-ranging concept of ethical consumption can leave the negative verdict behind that consumers are mainly an obstacle for sustainability and lead to a more optimistic view on modern consumers as allies and agents of change.

Keywords Sustainable consumption · Meat · Flexitarianism · Consumer society · Transition · Ethical consumer · Food citizen

E. de Bakker (✉) · H. Dagevos
LEI Wageningen UR (Agricultural Economics Research Institute), P.O. Box 29703,
2505 LS The Hague, The Netherlands
e-mail: erik.debakker@wur.nl

As the world begins seriously to take stock of the true cost of our food consumption—especially meat—the need to find powerful forces within ourselves and our cultures to help us change becomes more urgent. (Palmer 2010: 227)

Solving the Protein Issue Needs the Involvement of Consumers

As a global community, we are facing the significant challenge of feeding nine billion mouths in 2050 within the means of the global ecosystem (Godfray et al. 2010; Steinfeld et al. 2006). The production and consumption of animal proteins, i.e., meat and dairy food products, are among the most environmentally harmful components of the food package. In order to produce meat and dairy a great deal of plant material is required, and consequently large amounts of arable land, water and raw materials. The conversion of grains and other crops into animal foods is highly energy-consuming. As such, the consumption and production of animal proteins have become more urgent problems than ever. Experts predict enormous consequences for the environment, nature, and landscape as well as food security if we do not succeed in turning our consumption of animal proteins into a more sustainable, plant-based diet (Audsley et al. 2009; D'Silva and Webster 2010; FAO 2009; Keyzer et al. 2005; Pimentel and Pimentel 2003, 2008; UNEP 2007).

According to FAO we will have to double the production of meat and dairy to meet the predicted demand of animal proteins in 2050. This forecast is most alarming if we consider that the environmental impact of livestock must be halved *only* to prevent the current level of ecological damage from being exceeded (Steinfeld et al. 2006: iii). Such staggering projections make it understandable why many environmental experts nowadays doubt that innovative technologies and more efficient production methods *alone* will solve the environmental and social questions of livestock industry and global food security. Putting all our eggs in the basket of technology underestimates the possibility that technological innovations may happen too little, too late, or not at all. By the same token, the role of consumption is also easily underestimated or even overlooked in this line of reasoning. Currently, however, a healthy antidote to this technological perspective is provided by scholars who emphasize that consumption habits and food culture need attention:

[N]early every credible forecast shows that if we're to have any chance of meeting future food in a sustainable fashion, lowering our meat consumption will be absolutely essential. (Roberts 2009: 209)

Thus it becomes clear that while shifting technologies and stabilizing population will be essential in creating sustainable societies, neither will succeed without considerable changing in consuming patterns. (Assadourian 2010: 7)

The message is clear. Technological innovation is important but behaviour needs to change dramatically too. (...) Technological innovations alone will

not be sufficient to redress environmental problems. What is required in addition is a wide-ranging economic and cultural transformation of a way of life, now global in scope, which is “locked in” to consumption growth. (Smart 2010: 210–211)

The message is clear: a “technological” fix will not suffice, we also need a “behavioral” or “cultural” fix. This message is heard and passed on recently (e.g., Foresight 2011; Garnett 2011). We have to lower our meat intake and realize new, more sustainable ways of protein consumption. This inevitably raises the question addressed in this paper: Can consumers be considered as allies that should be involved in realizing new ways of protein consumption that contribute to a more sustainable food world? This question cannot be given a straightforward affirmative answer when it is realized that modern consumers are often portrayed as actors with a weak morality that makes them more likely an enemy than a friend of sustainability. In this paper we will argue against this negative view by explaining that consumers can and should be regarded as allies and agents of change.

Our line of argument is as follows. First we sketch the pessimistic view that ethics and sustainability does not stand much of a chance in a world of consumers. After that we will go into the development of meat consumption in the Netherlands and which strategies seem potentially most valuable in reducing our meat consumption. We suggest that consumers' interest and intensity in lowering their meat consumption vary. Consumers as main drivers of cutting their meat consumption may follow different routes of change. These different possibilities and potentialities are fully taken into account in our reflections on what can be expected of today's food consumers regarding their contribution to sustainability through low-meat or non-meat consumption. In this perspective, then, attention to the ethical debate on meat consumption will be paid. It is argued that rigid views on moral responsibility versus irresponsible behavior should be avoided, and that consumer change should not only or primarily be associated with rational persuasion strategies. Finally, we suggest a pragmatic approach that questions the prototypical citizen-consumer gap. This approach concentrates on various practices of sustainable food consumption rather than defining ethical or political consumption in desirable and strict terms. Ethical consumption is interpreted broadly within a framework that identifies several routes of change. This results into more optimism about opportunities to find consumer involvement that is required for reducing meat consumption in today's consumer society.

Consumers as Obstacles to Sustainability

The distinguished sociologist Zygmunt Bauman does not put much trust in modern consumers. Recently, in his *Does ethics have a chance in a world of consumers?*, he critically rejects our current consumer societies, in particular its economic freedom and market criteria that reflect instant consumption, instant gratification, and instant profit (Bauman 2009: 206). Though he tries to be hopeful, recalling philosophers as Emmanuel Levinas and Knud Løgstrup that insist on the importance of the Other as

an “ethical demand” and the primacy of ethics over realities of life-in-society, Bauman’s verdict on consumers is sharp and bitter:

The collateral victim of the leap to the consumerist rendition of freedom is the Other as the object of ethical responsibility and moral concern. (...) The possibility of populating the world with more caring people and inducing people to care more does not figure in the panoramas painted in the consumerist utopia. (Bauman 2009: 53–54)

According to Bauman (2009: 190) the consumer is the enemy of the citizen. Also other well-known scholars echo this critical stance on consumers when they argue that markets corrupt children and infantilize adults (Barber 2007) or when they coin concepts such as the Disneyization or McDonaldization of society (Bryman 2004; Ritzer 2000), rendering consumers as passive victims of market strategies that are ever more omnipresent and, therefore, prevent changes to more sustainable consumption patterns. As an indication that modern consumption and consumers are in no way connected to sustainability: one will look in vain for the headword sustainability in the indexes of the referred books by Barber, Bryman, or Ritzer. In other words, these discussions about modern consumers are far removed from the position that consumers are a *sine qua non* to solve the protein issue.

Negation of or (implicit) negativism towards consumers also turn up in environmental studies that deal with the production and consumption of meat and dairy (Steinfeld et al. 2006; UNEP 2007; Zhu et al. 2006). Because consumers cannot be trusted to change their behavior, frequently food policy and businesses strategies pin their faith on the supply side of the food market. Recommended interventions then mainly concentrate on resource-use efficiency, technological innovations, environmental policy, and production structure changes. At best consumers are addressed by the call to support the development of ecological labels. More likely, consumers appear to be taken implicitly or explicitly as an obstacle to sustainability. This line of reasoning finds confirmation in the attitude-behavioural intention gap (Roberts 1996; Vermeir and Verbeke 2006): although substantial number of consumers in the affluent world may hold the opinion that we have to do something about the environmental and animal welfare problems of modern livestock industry, many consumers do not act or act consistently so. Against this background the rational persuasion strategies that are suggested or implied at the end of an ethical exposé on meat consumption (e.g., Ilea 2009; Pluhar 2010), sound rather desperate. The call that people should be better informed about the moral complications of their meat consumption, and be urged to adopt a more sustainable lifestyle, seems like a voice crying in the wilderness of our supermarkets. And indeed, as we will address later on, such ethical persuasion strategies can be a pitfall.

Meat Consumption in the Netherlands

Since 2008 the Dutch government has placed priority on the protein issue in the Netherlands. For this reason, the former Ministry of Agriculture, Nature and Food

Quality commissioned a study to search for opportunities to promote sustainable protein *consumption* (De Bakker and Dagevos 2010).¹ Despite the just-mentioned “consumerist pessimism,” it appeared that sustainable consumption is not an oxymoron. Fertile soil for sustainable consumption can be identified, particularly from a perspective in which diversity and ambivalence are respected as salient characteristics of today's consumers and consumer society.

There can be no doubt that the production and consumption of meat (and dairy) are deeply embedded in the Dutch food economy. Historically, the Netherlands can count as the example of a Western country that is burdened with the consequences of a “productionist” agricultural policy that was introduced in the nineteenth century to achieve food security and economic growth. This policy of bulk goods had great success for a long time, but in the second half of the twentieth century it became clear that modern agriculture and the food industry was also associated with undesired environmental and health effects (negative externalities). In the last decades farmers and food industry have become an target of societal criticism, but this should not obscure the fact that they remain powerful actors in the (im)possibilities of a protein transition, i.e., a change of meat-centered diets to more plant-based diets (De Bakker and Dagevos 2010: 48–53).

The amount of meat consumption per capita has more than doubled in the Netherlands in the last 50 years: at the end of the 1950s the annual consumption per capita was about 20 kilos while it has risen to more than 43 kilos today. The amount of animal proteins consumed by Dutch consumers is more than twice as large compared to the average consumption per capita on a global level (PBL 2010: 35).

Scientific research of the last decades has clearly demonstrated that food choices are not determined by a single factor, such as for instance, price,² but by many motivations. With respect to meat eating various cultural-oriented values, such as, for instance, strength, health, masculinity, indulgence, are of special importance (e.g., Beardsworth and Keil 1997; De Boer et al. 2009; Fiddes 1991; Ruby and Heine 2011). However, the consumption culture surrounding meat is less a cliché than one might think. Not everyone associates meat with superiority, masculinity, or toughness. Although vegetarians are still often associated with persons of principle (a finding showing resemblance to Ruby and Heine 2011), most respondents in our survey answered neutral on questions which associate meat with hedonist lifestyles, masculinity, or toughness. Our data indicate that there might be a shift going on in the cultural image and appreciation of meat: that meat is less a token of masculinity as it is believed to be and that cultural values related to meat are slowly changing (see also Holm and Møhl 2000; Roos et al. 2001). Nevertheless, meat can still rely

¹ Besides a representative consumer survey (N = 800) and in-depth interviews with consumers (N = 25), in this study was spoken with several stakeholders: producers of meat replacements, a sustainable fish farmer, representatives of retail, and NGOs (N = 8). Next to empirical research, considerable attention was devoted to literature study focussing on the history of the protein policy in the Netherlands and the cultural anchoring of our contemporary meat-centered diet—that we coined carnivorous food culture.

² For this reason, it is questionable whether an additional tax on animal food products will lead to less meat eating or dairy consumption (Bunte et al. 2007; Mytton et al. 2007). Nevertheless, public debates about price measures are valuable because they could initiate more socio-ethical reflections on what is a fair price for food (De Bakker and Dagevos 2010: 78–80).

on a strong image as being healthy and nutritional. Our data also show that the image of meat as healthy appears to be an obstacle to consumers in moderating their meat consumption: Dutch consumers declare to be uncertain about whether a diet in which less meat is eaten is healthy and “balanced” (De Bakker and Dagevos 2010: 139–141). It is not helpful in this respect that most consumers in the Netherlands are unaware of the fact that they eat much more animal proteins than they actually require (PBL 2009; Šebek and Temme 2009). That is, it is no common knowledge that one can easily cut down on meat or dairy a few days a week without putting themselves on a nutritional risk.

Another interesting result of the study we have conducted is that more than a quarter of the Dutch consumer population (26.5%) are “meat lovers,” people who eat meat on an almost daily basis and who consider meat as an essential component of their meals. Opposite to this group one finds a small group (4%) of “meat avoiders.” These vegetarians do not eat meat at all. However, in between these groups of meat lovers and meat avoiders there is a large group—approximately 70% of our sample of 800 consumers—of so-called “meat reducers.” These part-time vegetarians or flexitarians restrict their meat consumption by having weekly at least one meatless day. This indicates that eating no meat regularly is adopted already by a group of several millions of Dutch consumers. Apparently, in everyday life one or more meatless days is becoming customary to many consumers. To them, abstaining from eating meat periodically has nothing to do with a strange or problematic food habit. Instead, non-meat consumption is an accepted food consumption practice.

Although large in size and despite the fact that flexitarianism is becoming a more fixed term recently, to our best knowledge, this group of meat reducers has hardly been recognized in neither scientific research nor received serious attention in sustainable consumption policy-making. This is striking enough, as we maintain that particularly this middle group of meat reducers offers promising opportunities for transforming our meat consumption patterns (De Bakker and Dagevos 2010: 19, 28). It could even be argued that the choice for eating less meat is better from an ecological perspective than the complete avoidance of meat (Holmes 2010). However, it should be noticed that this large food consumer group of flexitarians is very heterogeneous. Therefore, a policy that wants to facilitate opportunities for encouraging sustainable food consumption through this varied group of meat reducers, must look for a set of strategies that addresses very different motives and eating habits. In our opinion this requires a broad view on alliances with consumers that surely must not be restricted to consumers as responsible and engaged “food citizens.” One should not only focus on such political or ethical consumers, but also look for possible alliances with less active and involved consumers.

Alliances with Consumers: Routes of Transition

A broad view on alliances with consumers covers a colorful array of eating habits, mindsets, values, emotions, motivations and mentalities that could be addressed for sustainable food consumption. To moderate meat consumption at least three different routes of change can be proposed. In fact, these routes embody different

ambitions and expectations about the alliances that one wishes to create and cultivate with consumers.

Route 1: Sustainability by Stealth

The first route is called sustainability by stealth (a phrase borrowed from Nick Robins 1999: 11–12; see also Hinton and Goodman 2009: 8). In this route food consumers are considered fairly passive when it comes to their food. They do not generally concern themselves with difficult questions about food and feel no real need to do so. The alliance entered into with consumers here is characterized by passive partners on the demand side of the food market. They will accept sustainable food innovations, particularly if they are not very noticeable. In the last years some hybrid products (meat analogues in which part of the meat is replaced by plant-based ingredients) have made a promising entrance into the Dutch food market. By incorporating plant semi-manufactures in sausages, hamburgers, or mince products, a (small) hybrid product assortment has been created whereby eating sustainable products gradually becomes more accessible. They were advertised as products that were lean, containing less fat, thereby anticipating on the value of health (and not so much on sustainability). Although we speak about fairly passive consumers one should not forget that even this modest change in food consumption patterns will not happen without consumer trust and a minor (active) shift in the choices being made in the store.

This strategy has a strong technological component. Hybrid products are—similar to plant-based meat replacements—modified until they look and taste as the “original flesh foods” they mimic. While this imitation strategy may be beneficial to obtain food consumers’ attention and acceptability, unclear communication about “meat-like” products can lead to criticism that the public is being misled or that food enterprises are “messing unnaturally” with original products. Such backlash could trouble successful marketing of hybrid food alternatives that potentially can have serious sustainable impact.

Route 2: Moderate Involvement

This route of moderate involvement assumes that consumers are active and engaged citizens who form part of a civil society—also where food consumption is concerned. In this route, the idea is that social debate and taking small practical steps that appear to be very feasible will make our consumption more sustainable. Concrete action perspectives are found in moderating meat consumption through smaller portions or regularly incorporating a meatless day—the normality of such meat-free days could be supported by (smart) campaigns of NGOs and/or market organizations. In relation to the government, the consumer is a discussion partner with whom an open and sympathetic dialogue is maintained.

The large consumer segment of meat reducers is a target group in the route away from the nutrition transition in which the continuing growth of meat consumption is a central aspect. The reverse trend of “meatification” (Lang et al. 2010: 254) implies little less than a nutrition transition 2.0, so to speak. One of the challenges

here is to introduce meatless or low-meat dinner concepts that are presented as “normal” alternatives that simply taste good, are healthy, and are sustainable. This strategy becomes all the more relevant considering that the current market for meat substitutes is largely saturated. For this reason, it may be suggested that producers of plant-based meat analogues try to catch the attention of meat reducing consumers in more creative ways—e.g., by changing the focus from products to meal concepts in which the (cultural) “loss” of eating meat is made undone.

Another way of supporting this route of change is to create a more familiar and recognizable image around flexitarians and their dietary behavior. This would promote the normalization and familiarity of meatless or meat-limited food products, which, in their turn, give practical support to cutting personal meat consumption to more sustainable levels. Because meat reducers form a considerable part of the consumer population, even little changes in the “foodstyle” of flexitarians have substantial impact on changing the food consumer culture into more sustainable directions.

Route 3: Cultural Change

This route is an extension of the route of moderate involvement. Cultural change is about lifestyle alternatives that form a structural change with current consumption practices. This route is much more about changing cultural values (cultural innovation) than about the need or the search for technological innovations. Followers of this route are citizen-consumers who eat little or no meat and whose food choices take into account production method, animal welfare, or the environment. Food consumers equals food citizens. This route relates to consumer groups that are associated with a huge degree of “food awareness” and political or ethical motives: “cultural creatives” (Ray and Anderson 2000), “alternative hedonists” (Soper 2007, 2008) or “Lohas” (lifestyles of health and sustainability). Also the Slow Food movement can count as an example of this route in which a more encompassing lifestyle change dominates.

From a policy perspective, the consumers taking this route are the most stable ally with respect to sustainable consumption, but also a partner from whom severe criticism may be expected if they feel that the government is doing too little to achieve sustainable goals. It can be expected that the adherents of this route are sympathetic to more radical strategies such as simply giving up eating any meat at all or seriously narrowing down one’s meat consumption. These strategies of non- or restricted consumption of meat are confronting in a consumerist society that is based on the systematic creation and fostering of a desire to purchase goods in ever greater quantities—this holds par excellence for encouragements and advertisements to eat more meat. Nevertheless, in affluent countries cutting back on the (over)consumption of animal proteins is indisputably an effective step towards more sustainable development in the world of food.

An approach that acknowledges the importance of different routes of change, would be a major shift in the common policy on sustainable food consumption in the Netherlands. Mostly policy making concentrates on information campaigns or the support of technological innovations at the supply side. The three routes and their

examples serve as a model to inspire sustainable food policy by building alliances with modern consumers without neglecting the social diversity of modern consumer populations. Implementing this model is still a major challenge in the Netherlands.³ It is up to policy makers to decide about the parties they want to involve in consumer policy. Assuming that there is no single solution for the “protein puzzle” (PBL 2011), we suspect that it is crucial to involve parties from both industry and civil society. However, it is not self-evident that government authorities take the lead. They can also operate in the background, for example by facilitating parties (NGOs and/or market enterprises) that are promoting a food culture of eating less meat.

Weak and Strong Sustainable Consumption

Without meaning this in a pejorative way, the first two routes of sustainability by stealth and moderate involvement are routes of weak sustainable consumption, whereas cultural change may be described as a route of strong sustainable consumption (see Scholl et al. 2010). Table 1 gives an overview of the different routes captured as possibilities of weak or strong sustainability.

Furthermore, the fact that the three routes are distinct from each other does not imply that they are mutually exclusive. In fact, it is very well possible for one person to follow the route of cultural change during the weekends, and feel attracted to sustainability by stealth on busy weekdays. In view of the dynamism and versatility of modern consumer societies, there is no one road that leads to successful moderation of meat consumption. Therefore, it is important to find good combinations of these routes and combine them with practical marketing strategies in favor of improving sustainable food consumption. With respect to such strategies, we believe promising strategies for pushing the “protein transition” ahead, are (1) hybrid meat analogues, (2) meal concepts with no/less meat, and (3) promoting organic meat. These three strategies are not merely important as ways forward to achieve desired levels of sustainable meat consumption but also because they could be interpreted as stepping stones towards helpful changes in our food consumer culture—i.e., towards regularization of reducing our meat consumption. A growing demand for organic meat, for instance, does not contribute to sustainable food consumption in terms of a reduction of meat consumption as such. However, organic food consumption emphasizes food values that are inherent to the production process (sustainability, fairness, animal welfare, or food security). Reducing meat consumption in today's consumer society may benefit profoundly

³ This also depends on the administration that is in charge. Since October 2010 the Netherlands have a right-wing minority cabinet that holds a more neoliberal view on society. Because of this, consumer policy in the context of the protein issue has less attention than it had in previous years. This observation might also help to explain why Bauman's condemnation of the “consumerist utopia” is a much too sweeping statement. Probably his dark view on consumption is justified under circumstances of a “neoliberal utopia,” in which all purchases are subjugated to the laws of the market, and civil society has no influence on consumption whatsoever. But is such a total subjugation of consumption imaginable? Which state could serve as an example of such extreme conditions?

Table 1 Transition routes for solving the protein issue

	Weak sustainable consumption		Strong sustainable consumption
	Sustainability by stealth	Moderate involvement	Cultural change
Characterization of consumer alliance	Fairly passive relationship, oriented on minor shifts in consumption behavior	A discussion partner with whom an open dialogue is maintained	A loyal partner from whom severe criticism may be expected
Examples of eating habits and food culture	Regular eating of hybrid meat analogues or meat replacers that are perfect “taste-alikes”	Attracted to meatless or low-meat dinner as “normal” and healthy alternatives	Food citizens: vegetarian life style or a low level of (organic) meat consumption

from this accentuation of “intangible” food values because it may help to create more understanding and sincere feeling for sustainable food consumption in general. Our suggestion to take different marketing strategies as starting points for involving consumers as allies, offers possibilities to combine routes of both weak and strong sustainability.

Consumers as Citizens

Consumers are agents of change in the above-mentioned routes of transition. This implies that we take an affirmative view to the question whether consumers can be considered as allies that can be trusted with the challenge of creating a more sustainable society. This position opposes to theoretical reflections by scholars such as Bauman or Barber, which do not have much faith in the transformative capacities of consumers. Our line of reasoning is neither compatible (nor comfortable) with the alleged distinction between the citizen and consumer. The more so when it is maintained that this gap is (almost) impossible to narrow. Arguments that are mobilized here focus on the schism between engaged attitudes (citizen) and pragmatic behavioral choices (consumer), or point out that the group of so-called ethical or political consumers is only a small minority, and that this consumer-citizenship never will become mainstream or meaningful. Sometimes it is even argued that this group is largely a myth and that marketing ethics and social responsibility are inherently controversial (Carrigan and Atalla 2001).

Nevertheless, there is also a substantial line of research that suggests otherwise. A more hopeful perspective arises when the many ambivalences and mixed motives which feature contemporary consumers are taken into consideration. Let us first notice that current food consumption in welfare societies is characterized by a paradox. On the one hand we see a great need for variety. On the other hand there is search for tradition and stability. Consumers show interest in new products as well as a tendency towards conservatism and conformism. Research also claims that “the” (price conscious) consumer and “the” (idealistic) citizen are very much interlinked (see e.g., Brom et al. 2007; Dagevos 2005, 2009; Harrison et al. 2005; Jackson 2006; Korthals 2004; Micheletti 2003; Miller 1998; Schudson 2007).

Studies of “green” or “responsible” consumer profiles focus mainly on social and ethical motivations that people take into account in their decisions and choices. For many modern food consumers, collective issues like environmental pollution, animal welfare, the use of biotechnology or fair trade influence their individual purchase decisions to varying degrees. A relevant insight is that so-called “egoistic” (price, enjoyment, quality) and “altruistic” (consumer concerns, principles, ideals) motivating factors cannot be strictly separated. Private and public interests are inextricably entwined in the act of consumption and, indeed, also in consumers themselves. The distinction between citizen and consumer is an artificial one that has only limited merits in everyday consumption. Both civic virtues and self-interested benefits influence consumer behavior. As a consequence, the pivotal role of self-interest in the rational choice model omits the fact that consumer behavior is only within limits based on conscious and “selfish” reasoning. Consumer behavior can neither be excluded from ethical or emotional influences nor from pro-social or long(er) term action perspectives.

Assuming that there is no clear distinction between citizens and consumers, still leaves us with the objection that “citizen inspired” consumption behavior is substantially blocked by institutional conditions that shape our shopping environment. Are sustainable food choices not always hindered by the economic interests of big food companies, marketing strategies of large retailers and dominant cultural norms? From our point of view this would be an underestimation of the critical capacities and selfhood of modern people. Consumers are not mere passive or powerless victims, and the entire world is not overrun by multinationals or McDonaldization (see e.g., Miller 1998, 2001). Be it in a different manner as in their role of voters or active citizens—modern markets are no Greek agora—consumers are in their own way human agents that act, and “action logically involves power in the sense of transformative capacity” (Giddens 1999: 15). Surely, each individual is bounded by historical circumstances and power structures, but we also shape our social reality, often using the same structures that influence our behavior. This is what Giddens refers to as duality of structure. The rise of many consumer concerns about food and agricultural industry is an important driver of public debate and social change. It also illustrates the transformative capacity of consumer agency (Jacobsen and Dulsrud 2007: 478–480). The potentialities of consumers as change agents should not be ridiculed or even neglected altogether. In our opinion consumption is an omnipresent aspect of the modern world that can only be ignored by losing contact with social reality. By the same token, if it is recognized that consumers are part of the current ecological problem, it is reasonable and fair to assume that consumers are also part of developing more sustainable solutions (Schrader 2007; Spaargaren 2011; Spaargaren and Oosterveer 2010; Van Trijp and Fischer 2011).

Ethics and Meat Consumption

The above-presented findings of empirical research as well as our theoretical reflections on the alleged gap between citizens and consumers, have implications for

how we assess the ethical debate on meat consumption. We do not only believe that consumers' behavior deserves more serious attention in the sustainability problem, but also that we need an ethical approach that avoids rigid views on moral responsibility versus irresponsible behavior.

Ethical arguments for criticizing the consumption of meat can be briefly summarized as follows. From the perspective of global fairness it can be argued that people in the richer countries are mainly responsible for the ecological distortion of our earth and, therefore, should atone for the consumption of animals. Particularly the poorer countries are likely to suffer from this environmental degradation and the risk of food insecurity (FAO 2010; Thornton 2010). The moral duty of reducing our meat consumption can thus be related to responsibilities with respect to environment, other human beings, and future generations. Eating meat also raises fundamental ethical issues about our moral responsibilities towards animals, particularly regarding the commodification of animals in modern livestock industry (see e.g., Foer 2009; Preece 2008). From an animal welfare perspective, the ethical "scandal" of human consumption of animal flesh can be answered in radical or moderate ways. It can be said that we do not have the right to treat animals as factory products and that is why we should stop eating meat produced by such systems. A more moderate position in the same line of reasoning, albeit with a very different dietary outcome, is that we should only buy and eat meat from production chains applying high standards of animal welfare (see e.g., Fairlie 2010; Korthals 2011).

This summary of ethical arguments is by no means exhaustive nor does it justice to the ethical debates that are going on about this subject. But for the sake of our argument they serve as an illustration that there are several ethical arguments that can be put forward to convince people in Western countries to lower their meat consumption or become a vegetarian. However, appeals of ethicists to reduce meat consumption tend to be trapped in the pitfall of persuasion strategies (e.g., Ilea 2009; Pluhar 2010). This happens when they seem to assume that consumption is, or should be, an act of rational deliberation, and that the royal road is changing consumers into *food citizens*. The problem is that such an approach can easily result in deception. Many consumers seem deaf to ethical arguments and only a small minority of consumers truly adopts a sustainable foodstyle. "Good" ethical arguments are quickly forgotten when one is buying food. Taking notice of the well-known "attitude-behavioral intention," one could easily conclude that consumers will not provide a breakthrough in sustainable consumption because they are egocentric and irresponsible beings, probably powerless victims of profit seeking markets. One sadly starts to agree with Bauman that the consumer is indeed the enemy of the citizen, and that Western consumers have a weak morality.

However, such pessimistic conclusions are disputable. The point is that an ethical appeal based on rational persuasion is too narrow in the context of today's consumer society. As we described in the above-sections there is no clear boundary between "responsible" citizens and "irresponsible" consumers: private and public interests are intertwined in the act of consumption and also in consumers themselves. Purchase decisions are propelled by a broad range of motivations (emotions, perceptions, values, social norms, routines, convenience, and certainty) and the

challenge is to address this versatility of motivations. To put it in the terms of our different routes of change: the ethical debate on meat should not only associate consumer change with cultural change, i.e., the route of strong sustainable consumption, and ridicule or neglect the potentialities of other routes of change, i.e., sustainability by stealth and moderate involvement, that embody avenues of weak sustainable consumption. Such an ethical discourse runs the risk of becoming more and more academic, and, moreover, contributes to a narrow-minded perception of consumers and consumer society.

Taking a Pragmatic Approach: Practices and Reflexivity

A more pragmatic ethical approach is in place if we prefer to consider consumers as human agents with critical and transformative capacity. Materialistic consumption is not intrinsically bad or good, but morally complex—a dialectic process driven by many factors. If ethics wants to take the problems of meat consumption in modern societies seriously, it should beware of pointing at the cliché of consumer awareness and not rely on guilt as the main driver of behavioral change. In this sense something can be learned from studies of social or green marketing, the school of research that seeks to utilize tools, techniques, and concepts from commercial marketing in pursuit of social goals (Peattie and Peattie 2009). These studies tell us that one should move away from an over-reliance on guilt as a driver. Instead, one should find a mix of marketing tools that relates to feelings of involvement and identification. Campaigns that want to encourage less meat consumption should keep this in mind and consider a more positive approach (“Eating more vegetables is good for your health and good for the planet”).

Generally speaking, ethics should recognize the context of today's consumer society and its many ambivalences. Halkier (1999), Miller (1998), or Terry Newholm (2000) clearly point to the equivocality of our shopping behavior. Miller notes, for example, how different ethics can conflict with one another when we do our daily shopping. We may think about the ozone depletion, about animal treatment, but also about the budget and wishes of other members of the family. In the supermarket, he posits, we often subordinate our personal desires and values to concerns for others. According to Miller, shopping is essentially an act of love and care and not only about economic benefits or personal values that, allegedly, determine our purchase decisions. His anthropological study shows that love, social values, and feelings of care and responsibility are often connected in subtle and complex ways. Thus, the fact that green marketing studies tell us that guilt is not the main driver of our purchases does not imply that most consumers act egocentric and irresponsible.

If one speaks of “ethical consumers,” the crucial question is how this concept is conceived. Is this bound into notions of certain consumer segments that are featured by individualized attitudes, knowledge, and recognition? Or should this be understood as “the full complexity of the practices, motivations and mechanisms through which the working-up of moral selves is undertaken in relation to consumption practices?” (Barnett et al. 2005) When we think of ethical

consumption in terms of socially embedded practices, a broader and far less politicized view on sustainable consumers emerges. Ethical consumption, then, contains a wider array of consumption practices, whatever implicit and ambivalent these practices may be. It is not about consistent (moral) attitudes and (personal) behavior, it is about practices of people who have to consume in a world that can be very inconsistent. From this perspective the concept of “reflexive consumers,” suggested by Melanie Dupuis (2000), is an interesting way of seeing this broader ethical approach. She envisions (organic food) consumers as agents that take part in the creation of the food system but often without holding strong ideological views. In the latter case it seems more appropriate to talk about reflexive consumers instead of using the adjectives political or ethical.

A reflexive consumer is not a social activist, nor is he or she necessarily committed to a particular political point of view, as espoused by other actors in the network. The reflexive consumer does not necessarily ascribe to the ideologies of new social movements around food, and may evince characteristics of what Marxian approaches would identify as “false consciousness”—a tendency to be swayed by advertising, fads, status purchases, etc. However, the reflexive consumer listens to and evaluate claims made by groups organized around a particular food issues, such as GE foods, and evaluates his or her own activities based on what he or she feels is the legitimacy of these claim. (Dupuis 2000: 289)

This view of active rather than activist consumers does not alter the fact that the environment of our consumption deeply influences consumers’ behavior. Without an enabling environment it is very improbable that initiatives promoting sustainable food consumption will yield much effect. Governments and corporations have the responsibility to “create systems to make it easier for individuals to respond to the emerging norm that we ought to act in environmentally friendly ways.” (Nihlén Fahlquist 2009: 120). Whether and to what extent consumers really can become agents of sustainable change depends considerably on the opportunities and incentives offered or created by the infrastructure of consumption: to what extent is the sustainable choice the easy choice? This infrastructure of consumption stresses that both the material and socio-cultural environment of meat consumption deserves attention in solutions and marketing strategies aimed at promoting and facilitating sustainable foodstyles—more specifically regarding moderation of meat consumption. The material environment refers to the physical layout of shops and the product assortment on offer (the availability of food, the amount and variety of food outlets, the presentation of foods on the top of the shelves or at eye level, etc.). For example, the unprecedented abundance of meat in supermarkets, frequently offered relatively cheap or sold at record low prices, make it hard if not impossible for sustainable alternatives to compete with. The dominant infrastructure is usually not in favor of more plant-based food choices. The socio-cultural environment, in its turn, is less tangible. This considers the patterns or choice of consumption that are promoted, for example by advertising, must-haves, descriptive norms, etc. Meat is pre-eminently significant here because of the cultural embeddedness and symbolic meaning of meat eating. It is central on our plates as much as broadly taken as a token of

progress and prosperity. To change this iconic status of meat eating into a less favorable one will probably be a lengthy affair.

Conclusion

There is no reason for defeatist pessimism when the target is on exploring alliances with consumers that contribute to the realization of more sustainable food systems. It is most helpful here to question the gap between the citizen and consumer. Nuance the distinction between citizens and consumers by acknowledging their interconnection, results into a broad perspective on consumer alliances. Various consumer activities can contribute to reduce meat consumption and, consequently, support more sustainable food consumption practices. Consumers can participate in multiple ways in several routes of change. In particular the large food consumer group of meat reducers or flexitarians offer promising opportunities for transforming our meat consumption towards lower levels. As yet, scholarly attention for this varied group of meat reducers is embryonic. Exceptions to this current state of the art are earlier studies by Nicola Richardson or more recently by Markus Vinnari in which meat reduction and “demi” or semi-vegetarianism is given some notice (Richardson et al. 1994a, b; Vinnari et al. 2010). The meat reducers deserve to receive particular analytical attention in future research.

This paper exposes a broad perspective on consumers and their potential as agents of sustainable change through different routes of change. This viewpoint has direct repercussions for ethical debates on the human consumption of animal flesh. Such debates should neither be restricted to rational persuasion strategies nor to an alliance with “strong” sustainable consumers as it comes to changing meat eating habits of consumers. Such points of view easily lead to defeatism with respect to consumers’ willingness to change, and easily ignore interesting opportunities in transforming the food system into more sustainable directions. A wider framework includes also rather passive alterations of our diet that can be characterized as “weak” sustainable consumption—e.g., eating hybrid look-alikes: burgers or sausages composed of partly meat and partly plant-based ingredients. These kind of consumer contributions deserve ethical attention and approval as interesting ways of sustainable food consumption. The idea of ethical consumption should be wide-ranging and not limit itself to rational awareness and highly esteemed morals and motives.

The concept of the reflexive consumer can help to acknowledge the role of human agency in weak sustainable consumption. The reflexive consumer may be regarded as the counterpart of the political or ethical consumer. Just because people do not articulate ideological views about the (sustainability of the) food system does not mean that they do not evaluate the claims being made by food industry, authorities, or pressure groups. The reflexivity on many food issues related to our shopping behavior often shows a certain kind of equivocality. This ambivalence should not be judged as a lack of ethical rationality but as an understandable anthropological aspect of modern consumer life. The world of consumers is not as black or white as Bauman suggests. It is ruled as much by passive and routine

behavior as by critical capacities and consumer concerns. Consumers are not captive victims of economic forces, and consumption is, in a moral sense, neither good nor bad. This also applies to the ethical and global quandaries related to our (Western) habits of meat consumption. Consumers are allies that can be trusted with the challenge of realizing less meat-based diets that will contribute to a more sustainable world of food.

Acknowledgments We would like to thank the anonymous reviewers of an earlier version of this paper for their helpful comments.

Open Access This article is distributed under the terms of the Creative Commons Attribution Non-commercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author(s) and source are credited.

References

- Assadourian, E. (2010). The rise and fall of consumer cultures. In Worldwatch Institute (Ed.), *State of the world 2010: Transforming cultures from consumerism to sustainability* (pp. 3–20). London: Earthscan.
- Audsley, E., Brander, M., Chatterton, J., Murphy-Bokern, D., Webster, C., & Williams, A. (2009). *How low can we go?: An assessment of greenhouse gas emissions from the UK food system and the scope to reduce them by 2050*. UK: FCRN-WWF.
- Barber, B. (2007). *Consumed: How markets corrupt children, infantilize adults and swallow citizens whole*. New York: W.W. Norton and Company.
- Barnett, C., Cloke, P., Clarke, N., & Malpass, A. (2005). Consuming ethics: Articulating the subject and spaces of ethical consumption. *Antipode*, 37, 23–45.
- Bauman, Z. (2009). *Does ethics have a chance in a world of consumers?*. Cambridge: Harvard University Press.
- Beardsworth, A., & Keil, T. (1997). *Sociology on the menu: An invitation to the study of food and society*. London: Routledge.
- Brom, F. W. A., Visak, T., & Meijboom, F. (2007). Food, citizens, and market: The quest for responsible consuming. In L. Frewer & H. Van Trijp (Eds.), *Understanding consumers of food products* (pp. 610–623). Cambridge: Woodhead Publishing.
- Bryman, A. (2004). *The Disneyization of society*. London: Sage.
- Bunte, F., Van Galen, M., Kuiper, E., & Bakker, J. (2007). *Limits to growth in organic sales: Price elasticity of consumer demand for organic food in Dutch supermarkets*. The Hague: LEI Wageningen UR.
- Carrigan, M., & Atalla, A. (2001). The myth of the ethical consumer—Do ethics matter in purchase behavior? *Journal of Consumer Marketing*, 18, 560–577.
- D'Silva, J., & Webster, J. (Eds.). (2010). *The meat crisis: Developing more sustainable production and consumption*. London: Earthscan.
- Dagevos, H. (2005). Consumers as four-faced creatures: Looking at food consumption from the perspective of contemporary consumers. *Appetite*, 45, 32–39.
- Dagevos, H. (2009). Beyond the marketing mix: Modern food marketing and the future of organic food consumption. In A. Lindgreen, M. K. Hingley, & J. Vanhamme (Eds.), *The crisis of food brands: Sustaining safe, innovative and competitive food supply* (pp. 255–270). Farnham: Gower.
- De Bakker, E. & Dagevos, H. (2010). *Vleesminnaars, vleesminderaars en vleesmijders: Duurzame eiwitconsumptie in een carnivore eetcultuur* [Meat lovers, meat reducers and meat avoiders: Sustainable protein consumption in a carnivorous food culture]. The Hague: LEI Wageningen UR.
- De Boer, J., Boersma, J. J., & Aiking, H. (2009). Consumers' motivational associations favoring free-range meat or less meat. *Ecological Economics*, 68, 850–860.
- Dupuis, E. M. (2000). Not in my body: rBGH and the rise of organic milk. *Agriculture and Human Values*, 17, 285–295.

- Fairlie, S. (2010). *Meat: A benign extravagance*. Hampshire: Permanent Publications.
- FAO. (2009). *The state of food and agriculture 2009: Livestock in the balance*. Rome: Food and Agriculture Organization of the United Nations.
- FAO. (2010). *The state of food insecurity in the world: Addressing food security in protracted crises*. Rome: Food and Agriculture Organization of the United Nations.
- Fiddes, N. (1991). *Meat: A natural symbol*. London: Routledge.
- Foer, J. S. (2009). *Eating animals*. New York: Little, Brown and Company.
- Foresight. (2011). *The future of food and farming: Challenges and choices for global sustainability*. London: The Government Office for Science.
- Garnett, T. (2011). Where are the best opportunities for reducing greenhouse gas emissions in the food system (including the food chain)? *Food Policy*, 36, S23–S32.
- Giddens, A. (1999). *The constitution of society*. Cambridge: Polity.
- Godfray, H. C. J., et al. (2010). Food security: The challenge of feeding 9 billion people. *Science*, 327, 812–818.
- Halkier, B. (1999). Consequences of the politicization of consumption: The example of environmental friendly consumption practices. *Journal of Environmental Policy & Planning*, 1, 25–41.
- Harrison, R., Newholm, T., & Shaw, D. (Eds.). (2005). *The ethical consumer*. London: Sage.
- Hinton, E. & Goodman, M. (2009). *Sustainable consumption: Developments, considerations and new directions*. Environment, politics and development working paper series, Department of Geography, King's College London, Paper #12.
- Holm, L., & Møhl, M. (2000). The role of meat in everyday food culture: An analysis of an interview study in Copenhagen. *Appetite*, 34, 277–283.
- Holmes, B. (2010). What's the beef with meat? *New Scientist*, 207 (2769), 28–31.
- Ilea, R. C. (2009). Intensive livestock farming: Global trends, increased environmental concerns, and ethical solutions. *Journal of Agricultural and Environmental Ethics*, 22, 153–167.
- Jackson, T. (Ed.). (2006). *The Earthscan reader in sustainable consumption*. London: Earthscan.
- Jacobsen, E., & Dulsrud, A. (2007). Will consumers save the world?: The framing of political consumerism. *Journal of Agricultural and Environmental Ethics*, 20, 469–482.
- Keyzer, M. A., Merbis, M. D., Pavel, I. F. P. W., & Van Wesenbeeck, C. F. A. (2005). Diet shifts towards meat and the effects on cereal use: Can we feed the animals in 2030? *Ecological Economics*, 55, 187–202.
- Korthals, M. (2004). *Before dinner: Philosophy and ethics of food*. Dordrecht: Springer.
- Korthals, M. (2011). Emotions, truths and meanings regarding cattle: Should we eat meat? *Journal of Agricultural and Environmental Ethics*. doi:10.1007/s10806-011.9334-2.
- Lang, T., Wu, M., & Caraher, M. (2010). Meat and policy: Charting a course through the complexity. In J. D'Silva & J. Webster (Eds.), *The meat crisis: Developing more sustainable production and consumption* (pp. 254–274). London: Earthscan.
- Micheletti, M. (2003). *Political virtue and shopping: Individuals, consumerism and collective action*. New York: Palgrave Macmillan.
- Miller, D. (1998). *A theory of shopping*. Cambridge: Polity.
- Miller, D. (2001). The poverty of morality. *Journal of Consumer Culture*, 1, 225–243.
- Mytton, O., Gray, A., & Rutter, H. (2007). Could targeted food taxes improve health? *Journal of Epidemiology and Community Health*, 61, 686–694.
- Newholm, T. (2000). Consumer exit, voice, and loyalty: Indicative, legitimation, and regulatory role in agriculture and food ethics. *Journal of Agricultural and Environmental Ethics*, 12, 153–164.
- Nihlén Falhquist, J. (2009). Moral responsibility for environmental problems—Individual or institutional? *Journal of Agricultural and Environmental Ethics*, 22, 109–124.
- Palmer, M. (2010). Religion, culture and diet. In J. D'Silva & J. Webster (Eds.), *The meat crisis: Developing more sustainable production and consumption* (pp. 227–234). London: Earthscan.
- PBL. (2009). *Milieubalans 2009* [Environmental Balance Sheet 2009]. Bilthoven/The Hague: Netherlands Environmental Assessment Agency.
- PBL. (2010). *Voedsel, biodiversiteit en klimaatverandering: Mondiale opgaven en nationaal beleid*. [Food, biodiversity and climate change: Global challenges and national policy] The Hague: Netherlands Environmental Assessment Agency.
- PBL. (2011). *The protein puzzle: The consumption and production of meat, dairy and fish in the European Union*. The Hague: Netherlands Environmental Assessment Agency.
- Peattie, K., & Peattie, S. (2009). Social marketing: A pathway to consumption reduction? *Journal of Business Research*, 62, 260–268.

- Pimentel, D., & Pimentel, M. H. (2003). Sustainability of meat-based and plant-based diets and the environment. *American Journal of Clinical Nutrition*, 78, 660S–663S.
- Pimentel, D., & Pimentel, M. (2008). *Food, energy and society*. Boca Raton: CRC Press.
- Pluhar, E. B. (2010). Meat and morality: Alternatives to factory farming. *Journal of Agricultural and Environmental Ethics*, 23, 455–468.
- Preece, R. (2008). *Sins of the flesh: A history of ethical vegetarian thought*. Vancouver: UBC Press.
- Ray, P. H., & Anderson, S. R. (2000). *The cultural creatives: How 50 million people are changing the world*. New York: Three Rivers Press.
- Richardson, N. J., MacFie, H. J. H., & Shepherd, R. (1994a). Consumer attitudes to meat eating. *Meat Science*, 36, 57–65.
- Richardson, N. J., Shepherd, R., & Elliman, N. (1994b). Meat consumption, definition of meat and trust in information sources in the UK population and members of the vegetarian society. *Ecology of Food and Nutrition*, 33, 1–13.
- Ritzer, G. (2000). *The McDonaldization of society: New century edition*. Thousand Oaks: Pine Forge Press.
- Roberts, J. A. (1996). Will the socially responsible consumer please step forward. *Business Horizons*, 39, 79–84.
- Roberts, P. (2009). *The end of food: The coming crisis in the world food industry*. London: Bloomsbury.
- Robins, N. (1999). Making sustainability bite: Transforming global consumption patterns. *The Journal of Sustainable Product Design*, July, 7–16.
- Roos, G., Prättala, R., & Koski, K. (2001). Men, masculinity and food: Interviews with Finnish carpenters and food engineers. *Appetite*, 37, 47–56.
- Ruby, M. B., & Heine, S. J. (2011). Meat, morals, and masculinity. *Appetite*, 56, 447–450.
- Scholl, G., Rubik, F., Kalimo, H., Biedenkopf, K., & Söebeck, O. (2010). Policies to promote sustainable consumption: Innovative approaches in Europe. *Natural Resources Forum*, 34, 39–50.
- Schrader, U. (2007). The moral responsibility of consumers as citizens. *International Journal of Innovation and Sustainable Development*, 2, 79–96.
- Schudson, M. (2007). Citizens, consumers, and the good society. In D. V. Shah, et al. (Eds.), *The annals of the American academy of political and social science* (pp. 236–249). Los Angeles: Sage.
- Šebek, L. B. J. & Temme, E. H. M. (2009). *De humane eiwitbehoefte en eiwitconsumptie en de omzetting van plantaardig eiwit naar dierlijk eiwit*. [Human protein requirements and protein intake and the conversion of vegetable protein into animal protein]. Lelystad: Animal Sciences Group.
- Smart, B. (2010). *Consumer society: Critical issues and environmental consequences*. London: Sage.
- Soper, K. (2007). Re-thinking the ‘good life’: The citizenship dimension of consumer disaffection with consumerism. *Journal of Consumer Culture*, 7, 205–229.
- Soper, K. (2008). ‘Alternative hedonism’ and the citizen-consumer. In K. Soper & F. Trentmann (Eds.), *Citizenship and consumption* (pp. 191–205). Houndsmills: Palgrave Macmillan.
- Spaargaren, G. (2011). Theories of practice: Agency, technology, and culture—Exploring the relevance of practice theories for the governance of sustainable consumption practices in the new-world order. *Global Environmental Change*, 21, 813–822.
- Spaargaren, G., & Oosterveer, P. (2010). Citizen-consumers as agents of change in globalizing modernity: The case of sustainable consumption. *Sustainability*, 2, 1887–1908.
- Steinfeld, H., Gerber, P., Wassenaar, T., Gastel, V., Rosales, M., & De Haan, C. (2006). *Livestock’s long shadow: Environmental issues and options*. Rome: Food and Agricultural Organization of the United Nations.
- Thornton, P. K. (2010). Livestock production: Recent trends, future prospects. *Philosophical Transactions of the Royal Society B*, 365, 2853–2867. doi:10.1098/rstb.2010.0134.
- UNEP. (2007). *Global environment outlook GEO4: Environment for development*. Valetta: Progress Press/United Nations Environment Program.
- Van Trijp, H. C. M., & Fischer, A. R. H. (2011). Mobilizing consumer demand for sustainable development. In H. Van Lenteijn & K. Andeweg (Eds.), *The Transform model: Transforming agro innovation towards sustainable development* (pp. 73–96). Dordrecht: Springer.
- Vermeir, I., & Verbeke, W. (2006). Sustainable food consumption: Exploring the consumer ‘attitude-behavioural intention’ gap. *Journal of Agricultural and Environmental Ethics*, 19, 169–194.
- Vinnari, M., Mustonen, P., & Räsänen, P. (2010). Tracking down trends in non-meat consumption in Finnish households, 1966–2006. *British Food Journal*, 112, 836–852.
- Zhu, X., Van Wesenbeeck, L., & Van Ierland, E. C. (2006). Impacts of novel protein foods on sustainable production and consumption: Lifestyle change and environmental policy. *Environmental & Resource Economics*, 35, 59–87.