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Sustainability and meat consumption: is reduction realistic?

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Meat is critical with respect to sustainability because meat products are among the most energy-intensive and ecologically burdensome foods. Empirical studies of the meat-consumption frequency of Dutch consumers show that, apart from meat-avoiders and meat-eaters, many people are meat-reducers that eat no meat at least one day per week. Meat-consumption frequencies provide empirical evidence for different modes of “flexitarianism,” including light, medium, and heavy flexitarians. In particular, the existence of heavy flexitarians suggests that the customary position of meat and other animal-based dietary products in the food hierarchy is not inviolable. To improve our understanding of meat reduction, cluster analysis adds information about differences across flexitarians. Given the enormous environmental impact of animal-protein consumption and the apparent sympathy of consumers for meat reduction, it is surprising that politicians and policy makers demonstrate little, if any, interest in strategies to reduce meat consumption and to encourage more sustainable eating practices.

KEYWORDS: food consumption, diets, food preferences, consummatory behavior, public policy, meat

[I]f we're to have any chance of meeting future food demand in a sustainable fashion, lowering our meat consumption will be absolutely essential.

Paul Roberts, *The End of Food* (2009)

Introduction

Diet and sustainability are closely connected. Food choices, eating habits, and food-consumption patterns affect climate change, biodiversity, and the use of oil, water, and land, to mention only a few of the most critical environmental issues. Although consumers do not generally realize that their “foodstyles” are part of a broad sustainability framework, scientists contend that prevailing eating practices run alarmingly into the planet’s environmental limits. In particular, the consumption of animal-based food products—apart from meat these include dairy, eggs, and fish—is widely recognized to be environmentally harmful. A landmark study acknowledging the multiple impacts of meat production on ecosystems is the report *Livestock’s Long Shadow* by the United Nations Food and Agriculture Organization (FAO) (Steinfeld et al. 2006; see also Steinfeld, 2009). With respect to meat *consumption*—which is not *Livestock’s Long Shadow’s* primary focus—there is a strong scholarly consensus that plant-based foods are much better from both environmental and energy-efficiency perspectives than animal-based foods (e.g., Pimentel & Pimentel, 2003; 2008; Duchin, 2005; Baroni et al. 2007; McMichael et al. 2007; Marlow et al. 2009; Tukker et al. 2011). Therefore, reducing the

consumption of meat and dairy products (we will not focus on the latter here) is crucial for making our diets more sustainable and reducing the ecological footprint of food systems (Lang & Barling, 2013). As Peter Dauvergne (2008) notes, “Consuming so much meat is casting ecological shadows over rural ecosystems, global water and food supplies, tropical rainforests, and the earth’s climate.” Thus, from a sustainability standpoint, there is ample reason to assign much weight to meat consumption.

The main premise of this article is that consumption cannot be ignored in the sustainability discourse. Scholarly attention through a flood of scientific papers demonstrates that consumption is integral to the contemporary sustainability debate and this observation also holds for the realms of food and meat consumption (Durrant, 2009; Foresight, 2011; Garnett, 2011; Grunert, 2011; Van Trijp & Fischer, 2011; Westhoek et al. 2011; De Bakker & Dagevos, 2012; MacMillan & Nordgren, 2012; Oosterveer & Sonnenfeld, 2012; Spaargaren et al. 2012; Sutton et al. 2013).

Against the backdrop of the consumer-inclusive viewpoint, this article focuses on meat consumption. On a global scale, increasing meat-consumption levels is a paramount consideration, as the following section briefly elaborates. Notwithstanding this manifest trend, the two empirical studies underlying work reported here reveal that substantial numbers of Dutch consumers do not eat meat regularly. Different consumer groups have eliminated meat to varying degrees. So-called “meat-eaters” dine with meat on

their plate (almost) every day of the week, while a surprising number of “meat-reducers” (or “flexitarians”) consume meat only several days per week. The existence of these flexitarians suggests that the cultural dominance of meat may be less robust than normally thought. The three subsequent sections discuss these matters and present research results. This treatment is followed by consideration of a few topics of future investigation in the uncultivated field of flexitarianism.

The article’s two final sections are devoted to policy issues. The great variety of meat-reducers suggests the need for a broad view on public policy. As yet, the necessary policy involvement is nearly non-existent in the Netherlands and Europe more generally. To activate attention, we advocate first concentrating on the development of a politics of meat reduction using engagement and exemplification as the main policy instruments rather than relying on enabling and encouraging (to use the four “E-words” of the model developed by Defra, the UK’s Department of Environment, Food, and Rural Affairs). This course provides reason for optimism with respect to enhanced policy involvement in the near future and hope regarding food consumers’ willingness and ability to behave as engaged agents of sustainable change, both in the Netherlands and other European countries. Given the considerable environmental impacts associated with meat consumption and the prioritization of sustainability as a policy objective in Europe and among European Union (EU) member states, it is essential that research and policy making take up the challenge of reducing meat consumption.

Off-Trend: Reducing Meat Consumption

Despite many reports and persistent messages about the environmental effects of meat consumption or problems with animal welfare in factory farming in recent decades, for many people, meat eating remains quite acceptable. In addition, in almost every country and culture, meat becomes more attractive and desirable as a rising standard of living makes it affordable. Consumers who are getting wealthier are going to eat more meat, a pattern that few people in today’s world will escape. In the words of Michael Carolan (2011), “[E]ating large quantities of meat has become a cultural imperative throughout much of the world, having become a sign of affluence and modernity and a ‘right’ of consumer choice.”

The worldwide trend of increasing meat consumption is part of a broader process known as the nutrition transition, which has been unfolding since the early 1990s (see Popkin, 2001). The concept of a nutrition transition refers, among other things, to a rise in the consumption of livestock products as soci-

eties become more affluent. This increase in animal-protein consumption is accompanied by dietary shifts away from grains and vegetables. As a result, the nutrition transition is diametrically opposed to the scientific consensus that reduced meat consumption is highly advisable from a sustainability viewpoint. This prevailing understanding recognizes that meat products are among the most energy-intensive and ecologically burdensome food options. On a global scale, it is unlikely that the ecological footprint of food consumption (“foodprint”) will decline as long as the nutrition transition is occurring. As the consumption of (more) meat is an important element of this concept, the nutrition transition effectively confirms the iconic status of (eating) meat. In this context, efforts to encourage sustainable food consumption by reducing meat consumption is decidedly off-trend and therefore, to put it mildly, a challenge.

Are food consumers inclined to rise to this challenge? It is striking that to date few scholars have raised this question. With the exceptions of Nicola Richardson and colleagues (1994a; 1994b), Susan Baker (2002), and recent research by a handful of Nordic scholars (Vinnari et al. 2010; Latvala et al. 2012; Nordgren, 2012), scant academic attention has been devoted to meat-reducers. In the Netherlands, Hanna Schösler and colleagues (2012) have given attention to contemporary practices of meat consumption and we have conducted two consumer studies on eating meat and meat reduction.

Consumer Surveys

For the initial study reported here, we recruited participants through a research agency. The samples were representative of the Dutch population in terms of gender, age, and education level. Data gathering was performed between October 30–November 4, 2009 (first survey, N=800) and October 14–25, 2011 (second survey, N=1253) as detailed in Table 1.

We asked respondents to complete an online questionnaire. At the beginning of each survey, the participants answered questions about how they would identify themselves (meat-eater, flexitarian, vegetarian, vegan), and how many times per week they ate meat with the main meal of the day (mostly this is dinner in the Netherlands). The vegetarians and vegans in the sample were excluded from further analysis because the surveys pertained specifically to meat eating and meat reduction. All other respondents answered an extensive series of questions regarding their meat consumption; intentions and motives to consume more or less meat; assessment of meat alternatives, meat substitutes, and meat attributes; and judgment of the sociocultural significance of (eating) meat. Validated scales were used when

Table 1 Demographics of the two surveys performed in 2009 and 2011.

	Survey 1 (2009) N = 800	Survey 2 (2011) N = 1253
Gender		
Male	380 (47.5%)	622 (49.6%)
Female	420 (52.5%)	631 (50.4%)
Age (years)		
18–35	215 (26.9%)	250 (20.0%)
35–45	179 (22.4%)	384 (30.6%)
45–65	308 (38.5%)	493 (39.3%)
> 65	98 (12.3%)	126 (10.1%)
Education level		
Low	213 (26.6%)	359 (28.7%)
Medium	310 (38.8%)	469 (37.4%)
High	277 (34.6%)	425 (33.9%)

possible (for further details, see De Bakker & Dagevos, 2010; Dagevos et al. 2012).

When participants were asked how many times per week they normally ate meat at dinner, substantial numbers responded that they did not eat meat regularly. In the first survey in 2009, a large majority (69.5%) did not eat meat at least once per week. A minority consisting of slightly more than one quarter (26.7%) of respondents said that they ate meat every day of the week. These groups of meat-eaters and

“meat-lovers” contrast with the small group (3.9%) of vegetarians and vegans (“meat-avoiders”). Interspersed between these two archetypes are meat-reducers who are consumers accustomed to one or more meatless days each week. These part-time vegetarians, or flexitarians, clearly show that a commitment to one or more meatless days per week was at the time becoming relatively common practice for many Dutch consumers. That is, eating meatless meals appears to be part of the ordinary food-consumption practices of a sizeable number of people.

Figure 1 demonstrates that the second survey (conducted in 2011) confirmed the general results obtained two years earlier. The similar shape of the distribution is noteworthy. In addition, the differences between the two sets of results are striking with respect to meat reduction. Figure 1 shows that the number of heavy meat-eaters fell sharply in comparison to the first study: full-time carnivores declined from 26.7% (2009) to 18.4% (2011). At the other end of the spectrum, the number of heavy meat-reducers—those for whom meat is on the menu one or two days per week—rose from 11.6% (2009) to 14.8% (2011). When we used a light definition of meat-reducer (people who eat a meat-free dinner at least once per week), the number of meat-reducers rose nearly 10% compared to the 69.5% in 2009. A total of 77.1% of the surveyed consumers in 2011 were

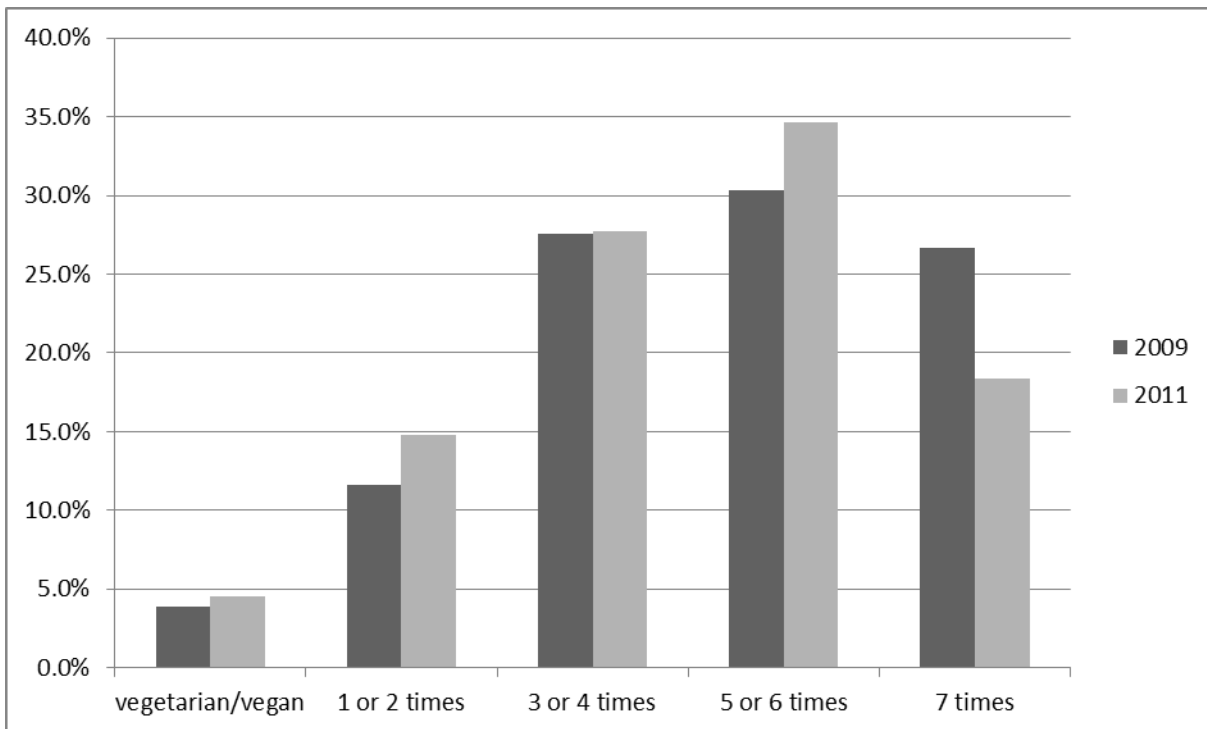


Figure 1 Weekly meat-consumption frequency.

meat-reducers when defined in this manner.

Although one may be reticent on the basis of these data to interpret the sustainability motives of those light flexitarians who abstain from eating meat at dinner once or twice per week, this reluctance is hard to maintain with respect to the medium and heavy meat-reducers (27.7% and 14.8% respectively in the 2011 survey). Taken together, 42.5% of the respondents reported being serious meat-reducers who eat no meat at dinner at least three days per week. When we add the 4.5% of the population that are vegetarians and vegans, or meat-avoiders, to the 14.8% that are heavy meat-reducers, the share of surveyed consumers that have meat-free or low-meat consumption patterns approaches one-fifth. From a meat-reduction perspective, it is also telling that this group is approximately of equal size to its counterpart at the other end of the spectrum. In other words, 18.4% are heavy meat-eaters, while 19.3% are either meat-avoiders or heavy flexitarians.

These figures demonstrate that many Dutch consumers do not eat meat for dinner every day. Further, many of them forsake meat for their evening meal on multiple days during the week. However, note that we have asked respondents to report how many times they eat meat for dinner on a weekly basis. That is to say, the data are about the meat-eating *frequency* of Dutch consumers, not about reduction in the *amount* of meat they eat. National statistics for the Netherlands indicate that meat consumption per capita has been generally stable since the mid-1990s (near the current consumption level of 43 kilograms per year), positioning the Netherlands in the middle of the range for European countries. This evidence suggests a meat paradox distinct from the one defined by Steve Loughnan et al. (2010) indicating that many people simultaneously dislike hurting animals and like eating meat. The intriguing meat paradox we encounter here is that absolute meat-consumption levels remain almost unchanged—with only a small reduction of a little more than one kilogram per year in the last two years—while a considerable number of people claim to abstain from eating meat several days per week. In other words, evident tendencies in individual meat-consumption practices are not yet visible in aggregate consumption figures. While it is important to continue to find consistency in this meat paradox, it seems unwise and premature to conclude that nothing is changing in terms of meat-consumption modes and consumer perceptions for meat.¹

¹ Can this paradox be resolved by methodological concerns regarding the well-known discrepancy between self-reported assessments and actual behavior? That is, are respondents' reported levels of meat reduction higher than the true values? Another contributing factor might be a growing division between heavy and light users

Hierarchy of Foods

Evidence that consumers' perceptions of meat products are less rigid than frequently supposed is revealed in respondents' answers in the second survey when they were asked to rank fifteen protein-rich food products.² This specific question in the 2011 survey was inspired by Twigg's (1983) hierarchy of foods in which meat (red meat and poultry) is at the top, followed by fish, eggs, and cheese. The animal-based foods are higher in status than fruit, vegetables, and cereals, which are at the bottom of the hierarchy. Despite the belief that this hierarchy of foods, reflecting the central or peripheral positioning of foods on the plates and in the consumption patterns, has universality (Boersema & Blowers, 2011; Schösler et al. 2012), closer scrutiny reveals subtle differences when the rankings of full-time meat-eaters (meat on the dinner menu for seven days per week) are compared with the hierarchy of foods by heavy flexitarians (meat for dinner one or two times per week). Table 2 shows the unsurprising result that for meat-lovers; products of animal origin are on top in the food hierarchy. Twigg's original hierarchy is corroborated, as the top ten is completely made up of animal foods, and the top four are all meat products. More interesting, however, is that the ratings of the heavy flexitarians differ greatly from Twigg's original hierarchy of foods.

First, the highest status is not reserved for a meat product, but rather for another (animal) product: cheese/cheese products. Second, plant-based protein products such as mushrooms, nuts, and pulses rank higher than some meat products, most notably beef. This ranking differs greatly from Twigg's hierarchy. From a sustainability viewpoint, this finding is important because replacing meat or other foods of animal origin with plant foods reduces the ecological footprint. Third, it is interesting to observe that sev-

of meat. In other words, a possible reduction in the consumed amount of meat by heavy flexitarians is easily compensated by those consumers who eat larger portions of meat more frequently as well as at dinner, breakfast, lunch, and for snacks. A third suggestion could be that rebound effects intervene. For instance, at the individual level, one might compensate for a low-meat or meat-free day by eating more meat the next day. A final possibility might be that out-of-home meat consumption differs from in-home consumption, while many respondents most likely have answered the questions with in-home consumption in mind. In sum, more questions arise than can be rigorously answered at present.

² The fifteen protein-rich food products were presented randomly to the respondents. Online-survey analysis offers the opportunity to ask participants to select products with a click of the mouse. With respect to this question, respondents were invited to vote on the products by giving their less-favored products the lowest value (by ticking the box belonging to 1, 2, and so forth) and the most-favored products the highest value (by ticking the box belonging to 15, 14, and so forth).

Table 2 Hierarchy of foods by meat-eaters and meat-reducers.

Hierarchy of foods by heavy meat-eaters	Hierarchy of foods by heavy meat-reducers
1. Chicken(breast)	1. Cheese / Cheese product
2. Beef	2. Chicken(breast)
3. Meatball	3. Egg
4. Chop (pork)	4. Salmon
5. Egg	5. Mushrooms
6. Cheese / Cheese product	6. Nuts
7. Fried fish fillet	7. Pulses
8. Salmon	8. Beef
9. Hamburger	9. Fried fish fillet
10. Minced-meat hotdog	10. Meatball
11. Mushrooms	11. Vegetarian meat substitute
12. Nuts	12. Hamburger
13. Pulses	13. Tofu
14. Vegetarian meat substitute	14. Chop (pork)
15. Tofu	15. Minced-meat hotdog

eral meat products are in the lower portion of the hierarchy, according to heavy flexitarians. For them meatballs, hamburgers, pork chops, and minced-meat hotdogs turn out to be much lower in status than various products of plant origin. The apparent fact that meat products are not necessarily deemed superior to non-animal food products suggests that consumers' appreciation of meat products is not unconditionally stronger than their appetite for the protein-rich plant foods in the presented ranking list.³ While the dominant position of meat in most contemporary food cultures is clearly evident, our findings suggest that its status is not indomitable (a suggestion also made by Holm & Møhl, 2000; Assadourian, 2010; Carolan, 2012; Ruby, 2012).

Modes of Meat Reduction in Future Research

Although being a meat-eater (a carnivore) is considered natural and normal, we do not observe a uniform meat-consumption pattern. Our survey data reveal that different consumer groups can be distinguished on the basis of meat-consumption frequency and modes of meat moderation differ across groups. Even if we leave the vegetarians and vegans (meat-avoiders) to the side, we are still able to identify dis-

³ Also inspired by the hierarchy of foods, 23 items—ranging from raw beef and medium-rare steak to chicken salad and peaches—are included in a study by Rozin et al. (2012). This study also finds modifications in comparison to the original hierarchy of foods. Next to the different foods that Rozin and his colleagues chose, compared to the list of foods in our survey, Rozin et al. (2012) are not interested in levels of meat reduction but in differences in the ratings by gender. The hierarchy of foods inspired part of Rozin's study on the maleness of meat results in a clear difference in the top three ratings for men (medium-rare steak, hamburger, and well-done steak, respectively) and women (chocolate, peaches, and chicken salad, respectively).

tinct consumer groups with heavy meat-eaters (meat-lovers) at one extreme of the continuum and heavy flexitarians at the other. Between these groups are the medium and light meat-reducers. These flexitarians abstain from meat on multiple occasions each week.

There has to date been a lack of clarity pertaining to these (heavy, medium, and light) meat-reducers and future explorations in the new field of flexitarianism may benefit from scholarly thinking that divides other consumer segments in a tripartite fashion. As the issue of meat consumption is a specific part of sustainable food consumption, we could improve our understanding of the characteristics of meat-reducing consumers by taking note of a number of other tripartite classifications. For instance, the three approaches to sustainability as described by Hopwood et al. (2005); the three groups of sustainable consumers as divided and defined by Seyfang (2007), McDonald et al. (2012), and Verain et al. (2012); or the three forms of voluntary simplicity developed by Etzioni (2003) are possibly helpful to further research that tries to gain insight into flexitarians.

When we opt to classify consumers into two groups of flexitarians—one making minor adjustments to habitual meat-consumption patterns and another undertaking radical transformations—another suggestion for future studies may be to consider the notions of weak sustainable consumption (wSC) and strong sustainable consumption (sSC), in which wSC is about choosing products that are less burdensome for the environment while sSC refers to fundamental changes in consumption patterns (i.e., reduction of consumption levels) (Fuchs & Lorek, 2005; Scholl et al. 2010; Lorek & Fuchs, 2013; see also De Bakker & Dagevos, 2012). The division between wSC and sSC makes a difference between quality—consuming differently and efficiently—and quantity—consuming less. This distinction may, in turn, be reformulated in terms of an (eco-) efficiency approach and a sufficiency approach (Boulanger, 2010; Freibauer et al. 2011) in which the first one emphasizes meat-reduction strategies through consumers opting for meat-free or low-meat *products*, while the other approach stresses *behavioral* change.

These conceptualizations are intriguing for future research into sustainable food consumption and, more specifically, reducing meat consumption. In trying to answer how realistic it is to encourage the further reduction of meat eating, the empirical evidence has clarified the importance of recognizing distinctive consumer groups that adopt different strategies for achieving more sustainable consumption practices. Consumers can be supportive only of moderate alterations of their meat-based dietary patterns, which results, at best, in a slow decrease of their meat-consumption frequency. However, food consumers

Table 3 Results of the cluster analysis (mean cluster centers).

Items	Conscious Flexitarians	Unconscious Flexitarians	Extravert Flexitarians	Disengaged Meat-Eaters	Meat-Lovers
Current meat consumption	3.0	2.7	4.5	5.5	6.0
Past meat consumption	2.5	3.3	3.7	3.8	4.0
Intentions to eat meat	2.6	3.5	3.8	3.7	4.1
Personal norm	5.8	2.7	4.0	3.3	1.6
Eating meat gives status	1.7	1.9	3.7	1.8	2.3
Commitment to meat reduction	6.0	4.3	4.1	4.4	2.5
Attachment to meat consumption	1.5	2.1	4.0	2.1	3.7
Positive health effect of meat consumption	4.0	2.7	3.7	2.7	2.0
Animal friendly and environmental friendly meat production	5.6	3.6	4.3	4.9	3.7
Ethical concerns about animal origin of meat	3.6	2.5	3.5	2.3	1.7
Price: meat is not expensive	3.0	3.0	4.0	3.0	4.0
Value for money of meat	4.0	4.0	5.0	5.0	6.0

also can take major steps to convert meat-centered foodstyles and reduce meat-eating frequency rather drastically.

Anticipating future research, we have attempted to improve our insight into different types of flexitarians by conducting a cluster analysis, including multiple variables and sociodemographic characteristics, of the segmentation based on meat-eating frequencies outlined above. We used a centroid clustering method with the squared Euclidean distance as the dissimilarity measure. Table 3 presents the items we have included in the cluster analysis, as well as the five clusters that resulted from this procedure (for further details, see Dagevos et al. 2012; for a comparison with another recent cluster analysis, see Vanhonacker et al. 2012).

The first group—termed “conscious flexitarians”—comprises consumers who make active decisions about reducing their meat consumption. These people feel obligated to reduce the amount of meat in their diets due to ethical concerns, health considerations, and personal norms. This category consists of a large percentage of females (70%) and is characterized by its high level of education, a finding concordant with the stereotype that flexitarians are mostly educated women. The second group is “unconscious flexitarians” and consists of participants whose score is low on motives centered on the ethical considerations and health effects of meat consumption. They have positive views of vegetarian meals and do not think that eating meat is associated with higher social status. Males and females are equally distributed, and the higher education level (college, university) is underrepresented. The third group of “extravert flexitarians” is made up of people

who reduce their meat consumption despite believing that it enhances social status. For this group, health concerns associated with meat consumption and the origins of meat are important. These extravert flexitarians are generally younger than the conscious flexitarians, suggesting that younger consumers are more attracted to meat reduction as something special (prestige) than as a moral act (principle). The fourth group of so-called “disengaged meat-eaters” consists of participants who often eat meat but also substitute fish or other alternatives on a regular basis. They do not score high on particular motives or personal norms for meat reduction, and this could mean that these consumers just eat meat routinely. Their commitment to reducing meat is only moderate, but their attachment to eating it is relatively low. In principle, this group could become medium flexitarians as they do not have strong motives for meat consumption. The final group consists of steadfast meat-eaters. Consumers in this group of meat-lovers do not intend to reduce their meat consumption and they confirm the stereotype of eating meat as a masculine phenomenon: a salient characteristic is an overrepresentation of men (62%).

The cluster analysis supports the segmentation based solely on meat-consumption frequency. Comparable groups were found based on the segmentation analysis and the cluster analysis. The conscious flexitarians and the segment eating meat one to two days per week are of a similar size (15%). The disengaged meat-eaters and the meat-lovers together have about the same share as the segments characterized by meat consumption five or more days per week (48% and 53%, respectively). The extravert and unconscious flexitarians are comparable with the segment that eats

meat three to four times per week. Despite these similarities, the added value of the cluster analysis is that along with meat-avoiders and meat-eaters, several subgroups of flexitarians can be identified. These three subgroups have different motives and sociodemographic compositions that improve the profiling of flexitarians. Remarkably, the majority of the flexitarians in all three groups do not identify themselves as such; most consider themselves meat-eaters. A minority of the flexitarians is conscious of their meat consumption and has strong motives to reduce it. Motives can be either intrinsic, such as ethical concerns or personal norms, or extrinsic, such as the status associated with meat consumption or price. The difference in scores on intrinsic motives demonstrates that flexitarians do not reduce their meat consumption only in response to ethical reasons or personal norms, but also because of health concerns and price or value for money. All in all, the cluster analysis shows that understanding flexitarianism by identifying consumers' motives and practices is a promising field of research, a pursuit currently in its infancy in science and of low priority in policy making.

Policy Involvement from the Ground Up

The heterogeneity among meat consumers opens up opportunities for policy engagement. However, attracting and activating policy attention for meat consumption is anything but straightforward. Despite ample scientific evidence that indicates the ecological problems raised by current meat-consumption patterns and levels, meaningful political attention is conspicuously absent. Apart from some interest on the part of the European Commission (EC, 2011) or an occasional member of the European Parliament who tries to put meat consumption on the political agenda, European policies regarding the moderation of meat consumption are effectively absent. Environmental campaigner Jonathon 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 meat policies are practically nonexistent and seem politically taboo.

The intriguing fact that issues of meat and, more generally, food are apparently so sensitive for European policy makers adds to the significance of the Dutch survey results. The most relevant finding is that a majority of flexitarians are making progress toward more sustainable foodstyles by reducing their meat-consumption frequency rather than by giving up meat completely. This means that policy makers—

irrespective of whether they are stationed in Brussels or located in government circles in European member states—could conceivably pursue policies that encourage reductions in meat consumption (an eat less meat approach) without endorsing initiatives to drastically cut or even ban it (a no meat approach) (see also Nordgren, 2012). Consumer receptivity to such a "war on meat" is unlikely because the great majority do not regard vegetarianism as an attractive alternative. Apparently, giving up meat is not easy, particularly in a carnivorous food culture. However, evidence suggests that reducing the number of weekly meat meals is a moderate way to induce behavior change that is acceptable and attainable for many consumers. A radical change is not required. For millions of Dutch food consumers, eating low meat or nonmeat meals regularly is already becoming a feature of everyday food-consumption patterns; for a sizeable group of people, such meals are currently regarded to be just as normal as those that include meat.

Perhaps the size of this group of meat-reducers, and the opportunities their consumption patterns offer for evolutionary sustainable change, could help to generate policy interest in addressing meat consumption. Of course, there are credible and urgent arguments that moderate or mainstream approaches to reducing meat consumption are not sufficient to attain a sustainable food system that respects our planet's ecological limits (see e.g., Roberts, 2009; Tukker et al. 2011; Vinnari & Tapio, 2012; Schösler et al. 2012; Lang & Barling, 2013). From this perspective, the mitigation of meat consumption may not be a sufficient solution but it would be a major step forward if policy makers were to embrace cautious initiatives regarding the unsustainability of present meat-consumption patterns.

Conclusion: Toward an Incremental Strategy

There has been a dearth of powerful public-policy actions thus far at both the national level of European countries, such as the Netherlands, and in the EU as a whole with respect to reducing meat consumption. Under current circumstances, an alternative consumer-oriented policy approach that addresses meat consumption in a varied manner seems more realistic than seeking to implement consumption taxes on meat or public-policy interventions in the consumer arena. Whatever the importance of such policy initiatives in principle, they likely would be regarded as overreaching in practice given that a meat-centered paradigm still prevails. As a consequence, scholarly justification for more vigorous policy involvement may not be very helpful at the present time. In addition to relevant academic discus-

sions about the importance of public-policy engagement and the role governments could play in addressing meat eating as an ecological challenge (Nordgren, 2012; Vinnari & Tapio, 2012), we suggest that the practical reality of current European policy making should be explicitly taken into account. As public-policy interest in meat reduction, as well as support for policy measures to reduce meat consumption, are currently scarce in European countries—not to mention other parts of the world—an incremental strategy appears appropriate.

A possible inspiration to develop such a gradualist strategy is provided by the four E's policy framework developed by Defra in the UK (see e.g., Dolan et al. 2010). This model consists of a series of governance interventions to move toward more sustainable consumption patterns: enabling, encouraging, exemplifying, and engaging.

Enabling and encouraging both concentrate on changing the institutional or structural conditions that influence consumers' food choices. Enabling is about reorganizing provisioning infrastructures to make them more suited to facilitate the accessibility, affordability, and availability of more sustainable products. Encouraging refers primarily to price interventions as a policy instrument. Enabling-like and encouraging-like arguments are frequently heard in regard to the need to change the context, or "choice architecture," in which consumption occurs to shape conditions to facilitate low-meat or non-meat choices. However, from the standpoint of political strategy it seems premature to push these two dimensions forward at the start. Enabling and encouraging need market-based and regulatory policy instruments, but the dominant tendency in the current supply structure and food culture is to enable and encourage the consumption of meat rather than to hinder and discourage it. Both conditions suggest that in the longer run it is more purposeful and effective to follow a strategy that starts with soft policies of engaging and exemplifying rather than with hard policies of enabling (e.g., laws, rules, nudges) and encouraging (e.g., taxes, subsidies). This recommendation is not, however, meant to suggest that hard policies cannot be effective when appropriately applied.

With respect to current challenges surrounding sustainable food consumption, engaging and exemplifying would deploy information-based instruments to raise consumer awareness, to develop understanding, and to realize commitment by consumers with respect to meat-eating and meat-reduction practices. Such an approach could prepare the ground for more assertive policy initiatives designed to enable and encourage. Engage and exemplify are directed at sociocultural conditions. Exemplify highlights that government policies are instrumental in setting a

good example for consumers. More concretely, this could mean that "governments and public bodies can themselves act as role models and market makers by choosing sustainable alternatives by default" (Reisch et al. 2011). Engaging is an even more people-oriented policy approach. Participation and interaction are its lifeblood. Engage and exemplify remind us that political negligence toward meat eating and its environmental impacts is counterproductive to raising consumer awareness about this important issue. Both notions might also stimulate public-policy initiatives that could guide and educate food consumers, such as supporting or subsidizing a vegetarian day every week (e.g., Meatless Monday, Thursday Veggie Day, see Leenaert, 2010; Wahlen et al. 2012). In addition, these schemes could spur policies recognizing that the meat politics of the near future should give much more attention to the cultural underpinnings of the dominant meat-eating pattern—for example, meat symbolizing masculinity, human mastery of nature, luxury, festivity, social and economic progress (see Lang et al. 2010; De Bakker & Dagevos, 2010; 2012).

A starting point for the suggested incremental approach is to direct attention to the commitment of politicians and policy makers and to heighten their motivation to develop greater interest in meat reduction. This commitment could be inspired by well-informed nongovernmental organizations (NGOs), cutting-edge consumers, and innovative businesses in the domain of new protein foods. Improved self-awareness will precede credible public policies of engaging and exemplifying aimed at influencing the mindsets and motivations of meat consumers themselves. As long as politicians and policy makers lack commitment, official advice and recommendations about meat reduction will not attract much attention or will be rejected by consumers as hypocritical. However, the implementation of policies, such as awareness-raising campaigns, targeted at consumer recognition of meat eating as unsustainable, is an important precondition for encouraging consumers to accept more invasive instruments. Such circumstances will create much stronger synergies between policy engagement and meat-reduction tendencies in consumption practices than currently exists. As a result, these public-policy initiatives will facilitate and stimulate the role of food consumers as change agents in the process of sustainability.

This policy posture will better connect with a reality of emerging flexitarianism, of consumer, media, and NGO interest in reducing meat consumption, and of companies' involvement in making meat substitutes more attractive and accessible. These aspects surely belong to today's Dutch context. Whether these circumstances compare to other European

countries is hard to determine at present due to the absence of much (comparative) research. (An initial example of the type of research that is needed is an exploratory study by Laestadius et al. (2013) that focuses on the role of NGOs, particularly in the United States and Canada, in encouraging reduction of meat consumption.) As mentioned above, more recently a few Nordic studies have explored meat reduction as a consumer phenomenon. Associations of vegetarians elsewhere in northern Europe also observe that flexitarianism exists. Regardless of whether flexitarianism will grow into a major European foodstyle as a third way alongside carnivorism and vegetarianism, lowering our meat consumption is too important to be ignored by politicians and policy makers who aim to realize a sustainable Europe.

References

- Assadourian, E. 2010. Cultural change for a bearable climate. *Sustainability: Science, Practice, & Policy* 6(2):1–5.
- Baker, S., Thompson, K., & Palmer-Barnes, D. 2002. Crisis in the meat industry: a values-based approach to communications strategy. *Journal of Marketing Communications* 8(1):19–30.
- Baroni, L., Cenci, L., Tettamanti, M., & Berati, M. 2007. Evaluating the environmental impact of various dietary patterns combined with different food production systems. *European Journal of Clinical Nutrition* 61(2):279–286.
- Boersema, J. & Blowers, A. 2011. Changing our eating habits by playing the cultural trump card. *Journal of Integrative Environmental Sciences* 8(4):243–252.
- Boulanger, P.-M. 2010. Three strategies for sustainable consumption. *Sapiens* 3(2):1–10.
- Carolan, M. 2011. *The Real Cost of Cheap Food*. London: Earthscan.
- Carolan, M. 2012. *The Sociology of Food and Agriculture*. New York: Routledge.
- Dauvergne, P. 2008. *The Shadows of Consumption: Consequences for the Global Environment*. Cambridge, MA: MIT Press.
- Dagevos, H., Voordouw, J., Van Hoeven, L., Van der Weele, C., & De Bakker, E. 2012. *Vlees Vooral (snog) Vanzelfsprekend: Consumenten over Vlees eten en Vleesmindere[n] (Meat as (yet) a Matter-of-course: Consumers About Eating Meat and Reducing Meat)*. The Hague: LEI Wageningen UR (in Dutch).
- 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 (in Dutch).
- 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.
- Dolan, P., Hallsworth, M., Halpern, D., King, D., & Vlaev, I. 2010. *Mindspace: Influencing Behaviour through Public Policy*. London: Institute for Government.
- Duchin, F. 2005. Sustainable consumption of food: a framework for analyzing scenarios about changes in diets. *Journal of Industrial Ecology* 9(1–2):99–114.
- European Commission (EC). 2011. *Roadmap to a Resource Efficient Europe*. Brussels: EC.
- Etzioni, A. 2003 [1998]. Voluntary simplicity: psychological implications, societal consequences. In D. Doherty & A. Etzioni (Eds.), *Voluntary Simplicity: Responding to Consumer Culture*. pp. 1–25. Lanham, MD: Rowman & Littlefield.
- Foresight. 2011. *The Future of Food and Farming: Challenges and Choices for Global Sustainability*. London: The Government Office for Science.
- Freibauer, A., Mathijs, E., Brunori, G., Daminanove, Z., Faroult, E., Girona i Gomis, J., O'Brien, L., & Treyer, S. 2011. *Sustainable Food Consumption and Production in a Resource-constrained World*. Brussels: European Commission.
- Fuchs, D. & Lorek, S. 2005. Sustainable consumption governance: a history of promises and failures. *Journal of Consumer Policy* 28(3):261–285.
- Garnett, T. 2011. Where are the best opportunities for reducing greenhouse gas emissions in the food system (including the food chain)? *Food Policy* 36(S1):S23–S32.
- Grunert, K. 2011. Sustainability in the food sector: a consumer behaviour perspective. *International Journal on Food System Dynamics* 2(3):207–218.
- Holm, L. & Møhl, M. 2000. The role of meat in everyday food culture: an analysis of an interview study in Copenhagen. *Appetite* 34(3):277–283.
- Hopwood, B., Mellor, M., & O'Brien, G. 2005. Sustainable development: mapping different approaches. *Sustainable Development* 13(1):38–52.
- Laestadius, L., Neff, R., Barry, C., & Frattaroli, S. 2013. Meat consumption and climate change: the role of non-governmental organizations. *Climatic Change* 120(1–2):25–38.
- 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.
- Lang, T. & Barling, D. 2013. Nutrition and sustainability: an emerging food policy discourse. *Proceedings of the Nutrition Society* 72(1):1–12.
- Latvala, T., Niva, M., Makela, J., Pouta, E., Heikkila, J., Kotro, J., & Forsman-Hugg, S. 2012. Diversifying meat consumption patterns: consumers' self-reported past behaviour and intentions for change. *Meat Science* 92(1):71–77.
- Leenaert, T. 2010. Making meat moderation marketable: the case for a weekly vegetarian day. In N. Koffeman (Ed.), *Meat the Truth: Essays on Livestock Production, Sustainability, and Climate Change*. pp. 161–171. Amsterdam: Nicolaas G. Pierson Foundation.
- Lorek, S. & Fuchs, D. 2013. Strong sustainable consumption governance: precondition for a degrowth path? *Journal of Cleaner Production* 38:36–43.
- Loughnan, S., Haslam, N., & Bastian, B. 2010. The role of meat consumption in the denial of moral status and the mind to meat animals. *Appetite* 55(1):156–159.
- MacMillan, T. & Durrant, R. 2009. *Livestock Consumption and Climate Change: A Framework for Dialogue*. Brighton: Food Ethics Council and WWF-UK.
- Marlow, H., Hayes, W., Soret, S., Carter, R., Schwab E., & Sabaté, J. 2009. Diet and the environment: does what you eat matter? *American Journal of Clinical Nutrition* 89(5):1699S–1703S.
- McDonald, S., Oates, C., Alevizou, P., Young, C., & Hwang, K. 2012. Individual strategies for sustainable consumption. *Journal of Marketing Management* 28(3–4):445–468.
- McMichael, A., Powles, J., Butler, C., & Uauy, R. 2007. Food, livestock production, energy, climate change, and health. *The Lancet* 370(9594):1253–1263.
- Nordgren, A. 2012. Ethical issues in mitigation of climate change: the option of reduced meat production and consumption. *Journal of Agricultural and Environmental Ethics* 25(4):563–584.

- Oosterveer, P. & Sonnenfeld, D. 2012. *Food, Globalization, and Sustainability*. London: Earthscan.
- Pimentel, D. & Pimentel, M. 2003. Sustainability of meat-based and plant-based diets and the environment. *American Journal of Clinical Nutrition* 78(S3):S660–S663.
- Pimentel, D. & Pimentel, M. 2008. *Food, Energy, and Society*. Boca Raton, FL: CRC Press.
- Popkin, B. 2001. The nutrition transition and its relationship to demographic change. In R. Semba & M. Bloem (Eds.), *Nutrition and Health in Developing Countries*. pp. 427–445. Totowa, NJ: Humana Press.
- Porritt, J. 2010. Confronting policy dilemmas. In J. D'Silva & J. Webster (Eds.), *The Meat Crisis: Developing More Sustainable Production and Consumption*. pp. 275–286. London: Earthscan.
- Reisch, L., Lorek, S., & Bietz, S. 2011. *Policy Instruments for Sustainable Food Consumption*. CORPUS Discussion Paper 2. Brussels: CORPUS.
- Richardson, N., Shepherd, R., & Elliman, N. 1994a. 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(1–2):1–13.
- Richardson, N., MacFie, H., & Shepherd, R. 1994b. Consumer attitudes to meat eating. *Meat Science* 36(1–2):7–65.
- Roberts, P. 2009. *The End of Food: The Coming Crisis in the World Food Industry*. London: Bloomsbury.
- Rozin, P., Holmes, J., Faith, M., & Wansink, B. 2012. Is meat male? A quantitative multimethod framework to establish metaphoric relationships. *Journal of Consumer Research* 39(3):629–643.
- Ruby, M. 2012. Vegetarianism: a blossoming field of study. *Appetite* 58(1):141–150.
- Scholl, G., Rubik, F., Kalimo, H., Biedenkopf, K., & Söebeck, O. 2010. Policies to promote sustainable consumption: innovative approaches in Europe. *Natural Resources Forum* 34(1): 39–50.
- Schösler, H., De Boer, J., & Boersema, J. 2012. Can we cut out the meat of the dish? Constructing consumer-oriented pathways towards meat substitution. *Appetite* 58(1):39–47.
- Seyfang, G. 2007. Cultivating carrots and community: local organic food and sustainable consumption. *Environmental Values* 16(1):105–123.
- Spaargaren, G., P. Oosterveer, & A. Loeber. (Eds.) 2012. *Food Practices in Transition: Changing Food Consumption, Retail, and Production in the Age of Reflexive Modernity*. New York: Routledge.
- Steinfeld, H., Gerber, P., Wassenaar, T., Gastel, V., Rosales, M., & De Haan, C. 2006. *Livestock's Long Shadow: Environmental Issues and Options*. Rome: United Nations Food and Agriculture Organization.
- Steinfeld, H. 2009. Making the livestock sector more sustainable. In F. Bunte & H. Dagevos (Eds.), *The Food Economy: Global Issues and Challenges*. pp. 109–119. Wageningen: Wageningen Academic Publishers.
- Sutton, M., Bleeker, A., Howard, C., Bekunda, M., Grizzetti, B., de Vries, W., van Grinsven, H., Abrol, Y., Adhya, T., Billen, G., Davidson, E. Datta, A., Diaz, R., Erisman, J., Liu, X., Oenema, O., Palm, C., Raghuram, N., Reis, S., Scholz, R., Sims, T., Westhoek, H., & Zhang, F. 2013. *Our Nutrient World: The Challenge to Produce More Food and Energy with Less Pollution*. Edinburgh: Centre for Ecology and Hydrology.
- Tukker, A., Alexandra Goldbohm, R., De Koning, A., Verheijden, M., Kleijn, R., Wolf, O., Pérez-Domínguez, I., & Rueda-Cantuche, J. 2011. Environmental impacts of changes to healthier diets in Europe. *Ecological Economics* 70(10): 1776–1788.
- Twigg, J. 1983. Vegetarianism and the meanings of meat. In A. Murcott (Ed.), *The Sociology of Food and Eating*. pp. 18–30. Farnborough: Gower.
- Vanhonacker, F., Van Loo, E., Gellynck, X., & Verbeke, W. 2012. Flemish consumer attitudes towards more sustainable food choices. *Appetite* 62(1):7–16.
- Van Trijp, H. & Fischer, A. 2011. Mobilizing consumer demand for sustainable development. In H. Van Lenteijin & K. Andeweg (Eds.), *The Transform Model: Transforming Agro Innovation Towards Sustainable Development*. pp. 73–96. Dordrecht: Springer.
- Verain, M., Bartels, J., Dagevos, H., Sijtsema, S., Onwezen, M., & Antonides, G. 2012. Segments of sustainable food consumers: a literature review. *International Journal of Consumer Studies* 36(1):123–132.
- Vinnari, M., Mustonen, P., & Räsänen, P. 2010. Tracking down trends in non-meat consumption in Finnish households, 1966–2006. *British Food Journal* 112(8):836–852.
- Vinnari, M. & Tapio, P. 2012. Sustainability of diets: from concepts to governance. *Ecological Economics* 74:46–54.
- Wahlen, S., Heiskanen, E., & Aalto, K. 2012. Endorsing sustainable food consumption: prospects for public catering. *Journal of Consumer Policy* 35(1):7–21.
- Westhoek, H., Rood, T., Berg, M., Van den, J., Nijdam, D., Reudink, M., & Stehfest, E. 2011. *The Protein Puzzle: The Consumption and Production of Meat, Dairy, and Fish in the European Union*. The Hague: Netherlands Environmental Assessment Agency.