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Consumer perception and trends about health and sustainability: trade-offs and synergies of two pivotal issues

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Modern affluent societies encounter the challenge of the so-called obesity pandemic in terms of health, and the environmental strain of resource intensive production and consumption in terms of sustainability. Consumer's role and the consumption side of the supply chain have been identified to be crucial in improving healthy choices and achieving sustainability goals, and both issues are increasingly discussed alongside each other. Arguments for why pursuing health and sustainability goals might entail challenges are presented, as well as arguments for why it might allow for synergies. It is concluded that understanding and acknowledging these interrelations can improve actions for tackling one of the issues alone, and even more so actions to advance both jointly.

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Crucial role of consumers and consumption for health and sustainability

Since 1950s, the industrialised countries have enjoyed levels of affluence unparalleled in human history, at least when using GDP as indicator [1]. A large share of the population of industrialised countries can fulfil both basic needs and more sophisticated needs and wants [2]. Emerging economies and their growing middle classes are entering a similar path. A downside of this development materialised in the growing overweight and obesity levels caused by sedentary lifestyles, unhealthy diets and excess of food. The so-called 'obesity pandemic' is not only decreasing quality of life, but also causing great public health costs [3]. As a result, a great share of children is overweight or obese, and it is feared that the generation in its teens today will be the first to have a shorter life than their parents [4••] — a peculiar development, given the potential well-being and happiness that the affluence should bring. International organisations as well as policy makers at national level have been tackling the issue in the past 10–15 years [5], and policy strategies, information, intervention and social marketing campaigns have been dedicated to alleviating the problem, accompanied by a large body of research fuelled by research funding. However, the problems are neither solved [6], nor are the alarming obesity rates curbed in all industrial countries. It has been found that action is needed both upstream and downstream, that is, structurally as well as on the level of each individual citizen. Policy makers, governments and food industry must cooperate for creating an environment with accessible, available, and attainable healthy choices or a 'choice architecture' that triggers healthier choices [7–9]; however, consumer's motivation to consider health in their food choice and diets constitutes a bottleneck [10].

The affluence of industrialised nations has another downside, which is the resource intensity and the strain that this puts on the environment and on the equity in sharing the benefits within and between generations. This complex of problems has received increasing attention in the broader society in the past decades under the notion of sustainability [11], although it has been a topic of concern for a segment of consumers and activists for a much longer period. With several of earth's natural systems identified as impacted beyond a tolerable threshold — that is biodiversity, nitrogenous and phosphorous circles, and climate change [12] — continued economic growth based on use of these resources is at threat. Around a third of greenhouse gas emissions are attributed to the food sector [13,14••]. Securing sufficient food for a growing human population is expected to be achievable only in case major international efforts are put into effect [15]. The consumption side of the problem is regarded as especially crucial for the issue of sustainability: Not only play consumers a pivotal role [16,17], it has also been seen that increased resource use due to expanding or changing consumer needs and wants can off-set efficiency gains (e.g. the so-called rebound effect, [18]), and industrialised countries' reduction goals are dwarfed by the magnitude of additional consumption when consumers in emerging countries demand to enjoy the same type of resource intensive lifestyles. An up-scaling of existent ideas for

sustainable lifestyles for all is needed to tackle the issue, combining fiscal and regulatory measures [14••] alongside with structural changes [19••].

Given the crucial relevance of both health and sustainability for the future of healthy nutrition and dependable food systems, it has been discussed to what extent these two issues are in conflict or can be aligned with each other. In the following, arguments for both sides are reviewed.

Why pursuing health and sustainability goals entails trade-offs

One approach for improving healthy eating aims at making 'the healthy choice the easy choice' by combining it with improved convenience, or by ensuring that no trade-off with taste needs to be taken into account via reformulation of the product [4••]. This might be achieved by food processing and product innovations such as functional food [20] or convenience products [21]. However, these product categories do not necessarily, but quite often entail greater processing, leading to a greater resource-intensity of the product. Packaging in smaller units or units containing a number of individually wrapped portion sizes is suggested as a means to discourage unhealthy overconsumption [4••]. Admittedly, this measure might also lead to a greater amount of package material that ends up as consumer household waste [22]. Healthy eating recommendations call for increased consumption of fruit and vegetables. However, fruit and vegetables are crops with a high ratio of losses in production and retailing, and the category is also causing an especially large share of household food waste [23]. Furthermore, as a perishable, seasonable and bulky category, storage and transportation is more complicated, and oftentimes transportation across longer distances is needed (the 'food miles', [24]), which is causing a share of greenhouse gas emissions [14••].

Appeals to decreasing food waste entail using leftover foods. This additional ethical concern, though, might lead some consumers to eat beyond their satiety level in order to 'clean the plate' [25] and thus overeat, or eat unhealthy leftovers (e.g. eat the meat remains as the most expensive and traditionally most valued part of the meal served, instead of the vegetable). Furthermore, although nowadays consumers waste too much food that would have still been edible, the intention to avoid food waste in the household might lead some consumers to consume food that they regard as unnecessary food waste, but which in fact is not edible anymore. While it is only few who actually engage in 'dumpster diving' or 'freeganism' [26], it might be somewhat more consumers who are concerned about their food waste, but lack the competence to identify the situations and the food categories where greater health risks are indeed involved (e.g. when the consume-by-date is passed for fish or meat). It is known that consumers are not sufficiently knowledgeable about food safety issues, and handling of food in the household is crucial for food safety [27]. Refrigeration allows keeping foods fresh and thus of good quality and more healthy for consumption, but it has been observed that its availability has triggered the increased purchase of more perishable goods, to the extent that is has been noted ''we now waste food not only *despite* our refrigerators, but almost *because* of them'' [14••]. Finally, while reduction of meat-based products is called for both out of health and sustainability reasons, the resulting diet needs to ensure all required nutrient levels are met, throughout all stages of the lifecycle, with concerns sometimes raised as to whether vegetarian or vegan diets can do so at all times.

Desirable food quality might relate to taste, health, convenience and process characteristics [28] such as the social or environmental impact of production. Foods potentially more sustainable are sourced from more environmentally friendly farming, animal husbandry with improved animal welfare, local, authentic and small-scale farming and food production. However, although it seems at least organic farming does not entail greater risks [29–31], at times potential negative relations between these approaches and food safety have been discussed and researched, as for example, the question of Salmonella and free-range chicken or mycotoxins in cereals that are farmed with no or reduced pesticide use.

Consumer food choice motives are often classified as self-centred motives on the one and 'altruistic' motives on the other hand, with the latter subsumed under ethical values [32]. It has been found that of the universal values that seem to drive differently characterised humans behaviour, certain values such as 'universalism' and 'benevolence' are related to sustainable food purchases [33••], while the opposing ones related to 'self-enhancement' are characterising those that do not engage in the respective behaviours. Instead, values related to self-interest seem to be drivers of choice, for example, convenience food [34]. These divergent values have also been related to the 'prosocial' versus 'proself' distinction of social dilemmas [19••], such as the control of a public good (e.g. the environment). A food purchase motive such as health is regarded as self-centred, while sustainability is regarded as altruistic. It has been argued that consumers might expect that more sustainable products must score lower on other quality attributes [17], due to a perceived trade-off of different credence quality dimensions for a given price. In any case, it has been found that a more sustainable product is also assumed to be more expensive [35]. Thus, a consumer prioritising self-centred motives might refrain from choosing products that are described as more sustainable, if a trade-off is assumed to exist between a self-centred motive such as taste, health, or low price and an attribute that should be of benefit to the broader society.