

# Sustainable Consumption of Food

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The 2030 Agenda for Sustainable Development provides a global blueprint for dignity, peace, and prosperity for people and the planet, now and in the future. At its heart are the 17 Sustainable Development Goals (SDGs) as an urgent call to action by all countries—developed and developing—in a global partnership. The fact that food is the basic resource for life highlights the need for a comprehensive goal that can be achieved by reducing food waste, promoting healthy and balanced nutrition, raising awareness of the society on responsible food consumption and developing policies on food consumption by regulatory authorities in connection with ensuring the sustainability of food consumption. Therefore, ensuring sustainable food consumption can also be seen as a generic goal that can be supported by almost all SDGs.

Keywords: sustainable food consumption ; food waste ; consumer behavior

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## 1. Background

According to the Sustainable Development Goals Report 2018, which was prepared by the United Nations <sup>[1]</sup>, by 2018, 108 countries had national policies on sustainable consumption and production. People rely on such materials to meet basic needs for food, clothing, water, shelter, infrastructure, and many other aspects of life. Across much of the developing world, an increase in the material footprint is required to enhance the living standards of growing populations. At the same time, it is important to decrease reliance on raw materials and increase their recycling to reduce environmental pressure and impact <sup>[2]</sup>.

In addition, SDG 2—Zero Hunger, SDG 3—Health, and SDG 4—Education can also be clearly associated with ensuring the sustainability of food consumption. It also constitutes a reference point for the achievement of SDG 2, as reducing food waste through sustainable food consumption will facilitate the fight against hunger and ensuring food security. At the same time, ensuring healthy lives and promoting well-being, which is the basis of SDG 3, is in a tight relationship with nutritional behaviors, which is a dimension of sustainable food consumption. Therefore, the components of sustainable food consumption such as balanced diet, conscious consumption and environmental protection will only be possible with the development and dissemination of effective education programs, raising universal awareness and realizing actions that will create behavioral change in people, thus supporting the goals of SDG 4.

Certainly, the sustainable consumption of food (SCF) is one of the most important issues of recent years. Over the last few years, many studies have revealed the dramatic view of food loss and waste for many countries and identified this as a global problem. Food consumption accounts for almost one-third of households' total environmental impact <sup>[3]</sup> and is thus of prime importance. These environmental impacts include climate change, soil degradation, water pollution, water scarcity, loss of habitats, and biodiversity. Food waste entails unnecessarily used resources, such as water, cropland, fertilizers, or fossil fuels, as well as greenhouse gas (GHG) emissions <sup>[4]</sup>. In the report of the Institute for Climate Economics, Rogissart et al. <sup>[5]</sup> estimated that GHG emissions from food consumption in 2010 were around 28% of global emissions with 13.8 GtCO<sub>2</sub>e (±3.6 GteqCO<sub>2</sub>). Around 75% of GHGs are emitted during the production phase, 15% between the farm gate and the retail store, and 10% after retail. Similarly, Sandström et al. <sup>[6]</sup> confirmed that the food consumption of European Union (EU-28) countries' citizens generated 540 MtCO<sub>2</sub> eq in 2010, including land-use changes. Barrett and Scott <sup>[7]</sup> suggested that GHG emissions can be reduced significantly through changes in the food sector. The European Commission <sup>[8]</sup> stated that the food sector was the cause of approximately 22% of global warming in Europe.

In terms of the total world population, in some regions people suffer from hunger and poor nutrition because of the inaccessibility of safe food and water <sup>[9][10]</sup>. On the other hand, in some other regions people are overweight or obese and still have an increasing tendency to dietary shifts toward more sugar, animal protein, and trans fats <sup>[11]</sup>. There are approximately 155 million overweight or obese children on this planet, whereas 148 million children are undernourished

<sup>[12]</sup>. To achieve sustainability in food consumption, food security and food safety issues should be considered together for both under- and over-consumption regions. Additionally, policymakers should pay more attention to complex interdependencies along the food chain and the complexities of modern global food systems <sup>[11]</sup>.

There is also a moral aspect of the sustainable consumption of food because consumers are assumed to feel guilty or uneasy about wasting food <sup>[13][14][15]</sup>. However, in a recent study, Watson and Meah <sup>[16]</sup> report that consumers are not conscious of the environmental impacts of food waste, and only a few accept social impact as a reason for feeling guilty about their food waste. Additionally, the most important drivers for consumers that prevent food waste are found to be time and money. Nevertheless, food consumption is not only an environmental and economic problem but also a social and ethical one. According to Ayala <sup>[17]</sup>, the perception of needs and desires; understanding of quality of life, progress, growth, and development in society; as well as cultural and ethical values, which are linked to consumption patterns, need to be emphasized.

There are some indexes that evaluate the countries according to food sustainability indicators. One of these indexes is the Food Sustainability Index (FSI). The FSI ranks 67 countries in terms of the sustainability of food systems. Environmental, social, and economic performance indicators are the three key indicators of this index. This index, which evaluates this concept in the three categories of “food loss and waste,” “sustainable agriculture,” and “nutritional challenges,” was formed by qualitative and quantitative evaluations of 38 indicators and 90 individual scales. France is in first place among 35 high-income countries in the 2018 edition of the FSI, followed by the Netherlands and Canada. In this index, Turkey is ranked as 58th out of 67 countries <sup>[18]</sup>.

The sustainable consumption of food has become one of the key priorities of national strategies and policies. The 2013–2017 Strategic Plan of Ministry of Food, Agriculture and Livestock of Turkey identifies three main missions—ensuring access to safe food and high-quality agriculture products, which are demanded by Turkish and global markets; ensuring sustainable usage of agricultural and ecological resources; and determining and implementing policies to increase the standard of living in rural areas <sup>[19]</sup>.

## **2. Sustainable Development and Consumption**

The concept of sustainability is accepted as an important issue to examine by a variety of disciplines, such as economics, marketing, and environmental sciences. Nkamnebe <sup>[20]</sup> defines sustainability as “...a global approach towards securing lasting welfare for the entire human race.” It has primarily risen from environmental or ecological aspects, followed by economic, social, and political dimensions <sup>[21]</sup>. Within this framework, sustainable development represents development that meets the present needs without compromising the abilities of future generations to meet their needs <sup>[22]</sup>. However, it is possible only through the integration of environmental, economic, and social components of development <sup>[23]</sup>. In terms of sustainable development, sustainable solutions should protect social equity; respect cultural pluralism; be ecologically sound and economically viable; be based on science, which considers the material and non-material bases of life equally; adapt to technologic developments; and be designed to empower and develop human capacity and potential. Sustainable development aims to find a balance amongst these objectives <sup>[24]</sup>. With the widespread objectives and scope of sustainability, sustainable consumption is an important topic that has attracted much attention in research and industry.

In the marketing context, sustainable consumption is mostly discussed from economic and societal aspects. Wolff and Schönherr <sup>[25]</sup> define sustainable consumption as a socially and ecologically concerned way of buying, using, and disposing of goods and services. From a more comprehensive and analytical perspective, it covers the complex social, economic, and political drivers of global environmental change, including global climate change <sup>[26]</sup>. Thus, the focus is on a resource-efficient and low carbon economy. Lee <sup>[27]</sup> also suggests that ecological and socially responsible citizens make their private consumption decisions focusing on environmental concerns. Kymäläinen et al. <sup>[28]</sup> focus on Generation Z, the future consumers, and their habits relating to sustainable food consumption, and suggest that the consumption behavior in the future can be associated with large-scale global concerns relating to sustainability, intertemporal consumer choices and life cycle models. They found that the attitudes of younger generations towards sustainable food consumption came from their families and that their spontaneous lifestyles made it difficult to manage their food waste behaviors. Additionally, the economic factors, e.g., price, are found to be more important than the environmental aspects, so that studying their attitudes required a business perspective. According to Jones et al. <sup>[29]</sup>, sustainable consumption requires an integrated approach including the individuals' consumption decisions, marketers' business policies, and authorities' supervision and monitoring. Finally, Balan <sup>[30]</sup> focuses on retailers' role in engaging consumers in sustainable consumption and states that retailers must accomplish consumers and shoppers during the entire chain from awareness creation to waste reduction. The retailers are supposed to have many effective tools to engage consumers in sustainability, such as merchandising

techniques, assistance to consumers throughout the sales process, promotions, etc., in order to provide sustainable choices to consumers, staging shopping experiences that enable consumers to make sustainable choices, reshaping norms to foster sustainable consumption, etc. [30].

Although it is not explored and well defined yet, sustainable consumption has three main aspects: caring for the environment, considering the needs of future generations, and meeting basic needs wisely. In studies such as Vermeir and Verbeke [31], sustainability is explained with the combination of economic, ecological, and social aspects. Furthermore, from the consumers' point of view, sustainable consumption incorporates attitudinal, cognitive, and behavioral aspects. While attitudes, beliefs, and knowledge about food are suggested to influence the food consumption choices, according to Wongprawmas et al. [32], personality, social groups, and socio-cultural position of individuals cause differences in the effects these factors create on them. In other words, sustainable consumption practices cannot be assured only by the behavioral aspect; it also requires individuals' positive intention and deep commitment [33]. Thus, there is no exact consensus on the aspects of sustainable consumption in the existing literature.

### **3. Sustainable Food Consumption: Concept, Aspects, Challenges, and Strategies**

In terms of the politics regarding sustainable consumption and production, food consumption is a major issue with its impact on the environment, individual and public health, social cohesion, and the economy. The sustainable consumption of food has been studied using various approaches. Some studies focused on meat consumption [34][35][36][37] and organic foods [38][39], while many others include environmental impact [40][41] and nutrition and health [42][43][44][45]. Some others have studied psychosocial determinants [46][47] as well as challenges and barriers [11][48]. Food consumption behavior on an individual level is mostly affected by cultural traditions, norms, fashion, and physiological needs. Grunert and Juhl [49] found that environmentally concerned people are more likely to buy more sustainable foods. Similarly, Nguyen et al. [39] also state that consumers with greater environmental concern are more likely to engage in environmentally friendly behaviors. Additionally, personal experiences such as tastes, health, and exposures, such as the availability of foodstuff, are other determinants. Furthermore, affordability, time availability, and household decision-making are effective in food consumption choices. Wongprawmas et al. [32] have also researched the determinants of food consumption choice and classified the factors as biological determinants (e.g., hunger, appetite, and taste), psychological determinants (e.g., mood, stress, and guilt), physiological determinants (e.g., access, education, and time), social determinants (e.g., culture, family, and peers), and economic determinants (e.g., cost, income, and availability). In addition, restricted food, green consumption, local consumption, and meat and protein substitutes are the derived factors for sustainable food consumption [50]. In demographic characteristics of households' context, there are remarkable differences in terms of age as well as gender. For example, women tend to behave more sustainably [51][52][53]. In terms of age, there are controversial findings in the literature. For instance, Verain et al. [54] revealed that consumers with a less sustainable lifestyle are younger, while Azzurra et al. [51] found older people tend to be low-intensity consumers. Using these behavioral and demographic factors, some studies determined consumer typologies. De Barcellos et al. [55] identified consumer clusters of indifferents, environmentally conscious, or sustainability-oriented citizens, while Bulut et al. [56] classify consumers as "indifferents", "sustainability enthusiasts", or "sustainability pioneers".

One of the primary consumption areas that has the largest impact on the environment is food consumption, which creates almost one-third of households' total environmental impact [3]. A Life Cycle Assessment (LCA) defines the environmental impacts as an open loop with an approach called "cradle-to-grave." LCA is suggested to be associated with only environmental components such as emissions, resource consumption, and environmental and health impacts associated with processes, products, or activities over their entire life cycles [57][58]. Consumers' behaviors during the handling and preparation stages also cause environmental impacts, through storage, cooking, and dishwashing. In addition, consumers affect the environment with their nutrition styles and diets. It is proven by many researchers that consumers are either unaware of or underestimating the relationship between food consumption and climate change [59][60][61][62][63]. In the study of Truelove and Parks [62], a survey performed in the US found that only 10% have associated meat consumption with climate change. According to the study of Lea and Worsley [60], 22% of respondents in Australia believe that it would provide an environmental benefit to consume less meat. Heiskanen et al. [64] highlighted the role of education to promote sustainable consumption. There is no doubt that nutrition lifestyle not only has an impact on our health but also on the health of the planet. However, these prior studies have focused on the impact of food consumption on the environment. They are limited in explaining the influence of consumers' knowledge and awareness on avoiding the unsustainable consumption of food.

As a measure of how consumers' activities affect the environment and sustainability from different aspects, knowledge of different types of footprints is important because footprints are the quantitative expressions of the appropriation of natural resources by humans [65]. Herva et al. [66] proposed the ecological and carbon footprints to be the most appealing indicators for enterprises. As an addition to this study, the OPEN: EU Project within the Seventh Framework Program has extended the integrated footprint family by adding the water footprint in collaboration with an environmentally extended multiregional input-output (MRIO) model [67]. The existing literature also accepts these three footprints (ecological, carbon, and water) as the most important indicators together with the energy footprint because they refer to four worldwide concerns over threats to human society: food security, energy security, climate security, and water security [68].

Apart from environmental issues, many factors are identified in the literature in terms of motives and barriers to the sustainable consumption of food. Nutrition, health consciousness, social identity, concern for farmers, ethical concerns, food security, perceived availability, store reputation, and concerns about animal welfare are among the factors that influence the purchase of sustainable products, whereas high prices, time limit, access, lack of information, trust in labelling, limited marketing communication, and unawareness of environmental impact are the main barriers [61][69][70][71][72][73]. More specifically, Sidali et al. [74] found five main motivations of consumers toward sustainable foods: ethical attributes, naturalness, health-related aspects, terroir, and innovation. On the other hand, Gorgitano and Sodano [75] defined three main obstacles: the rebound effect, the knowledge-action gap, and the behavior-impact gap, which are limiting the sustainable consumption of food. At the individual level, lack of planning and purchasing, shopping routines, and lack of knowledge about the storage, preparation, and reuse of food were defined as the major causes of the unsustainability of food [15][76].

At this point, two broad behavioral strategies toward sustainable food consumption can be distinguished. The first strategy is to make sustainable product choices concerning the way the product is produced, such as organic, free-range, or fair-trade products. The second strategy is to choose sustainable dietary patterns concerning dietary composition, consumption curtailment, and reduced quantity within product categories such as reduced meat consumption [54]. In addition, consumer behavior is also affected by perceptual biases, such as the halo effect, where products that are perceived as ecological are also perceived as better in other aspects, such as nutrition, health, etc. For example, an eco-labeled product may not only taste better and have a smaller environmental impact than the non-labeled alternative, but it is also perceived to be healthier [77]. This situation also reflects the fact that consumers may have limited factual knowledge about the environmental impact (footprint) of food [78]. Another bias is "compensatory green beliefs," according to which some consumers feel that every individual is entitled to a certain budget of resources, so that savings in some resources gives them the right to offset by consuming more of other resources (or increasing waste), within the limits of this budget. Combined with the "negative footprint illusion," this idea most likely causes consumers to engage in acts of green consumption without actually lowering their total environmental impact [41]. Despite the huge body of psychological, sociological, and anthropological literature about consumer behavior, there is still confusion about how to induce long-term behavior changes for a healthier and more sustainable lifestyle. Nudging consumers toward a more sustainable lifestyle seems to be promising, but it still needs more research for specific guidelines for practitioners [79][80].

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