

Discussion: Food Consumption to Embody Multidimensionality: The Role of Information: Viewpoints and Issues

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1. Environmental Impact in Food Consumption in Japan

In this discussion, we would like to discuss perspectives to understand the nature of food consumption with pro-social values.

We continue to put a burden on the environment in order to live. Food consumption is also a source of environmental load (Godfray *et al.*, 2018). The food products that emit the most greenhouse gases are meat, milk, eggs, and other livestock products, which emit 50-60 kg of carbon dioxide equivalent per 10,000 JPY¹). The environmental burden of meat, milk and eggs is significant. Greenhouse gas emissions from food consumption are on the rise in the 2000s.

2. New Food Tech for Sustainability

One way to reduce the sustainability problems caused by food consumption is to apply new technologies to food production. New food-related technologies, also known as “food tech“, are being researched and developed in many countries. For example, gene-editing technology can be used to develop new varieties with new characteristics with high efficiency (Ma *et al.*, 2018). Technologies such as plant-based meat and cultured meat have the potential both to meet consumer needs for livestock products and to reduce the environmental burden (Slade, 2018).

However, proper safety management and technical communication are essential and need to be addressed for these new food technologies to be accepted by society (Kato-Nitta *et al.*, 2019).

3. Importance of Various Food Culture

In addition, various foods other than animal products have traditionally been used as protein sources all over the world (Muranaka, 2016). These foods have rich user experiences and have credible achievements as human foods. Moreover,

they do not require advanced production facilities or new intellectual property. Therefore people can produce them using just mature technologies and can produce them anywhere as long as materials are available.

These kinds of traditional non-meat protein sources may become more popular to reduce the environmental burden. However, consumer neophobia and disgust should be overcome (La Barbera *et al.*, 2018).

Rather than aiming to return to the traditional Japanese diet, we would need to use new foods produced by food tech and various traditional diets from around the world to optimize the sustainability and enjoyment for the maintenance of health, based on each individual's values.

4. Mitigation of Cognitive Load in Food Consumption with ICT

Incidentally, we have to make a lot of decisions in food consumption. However, human information processing capacity and cognitive resources are limited. In those situations, we have the motivation to reduce the cognitive load in each decision. Heuristics is the concept of simplified decision making.

The difficulty of making decisions based on various pro-social values, such as the environment, fairness of food system, and rationalized nature may increase. In order to promote pro-social-value-based food consumption, it is necessary to create a social environment and institution for heuristics in food consumption. ICT will be very important to mitigate consumers' cognitive load to make decisions in food consumption.

Some level of intervention in food consumption by government may be affordable to ensure sustainability and improve health. However, we need to consider that eating habits are an important part of private life. We must carefully discuss the extent to which intervention in dietary habits is

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1) The evaluation of intensity of greenhouse gas emission in food

consumption is calculated using a dataset combining 3EID (Nansai *et al.*, 2012) Input-output Table and Family Income and Expenditure Survey, based on Ihara *et al.* (2009).

permissible from the perspective of improving the public interest.

Various previous studies have pointed out that consumers positively evaluate product attributes that contribute to sustainability and other social benefits (Tully and Winer 2014; Briggeman and Lusk, 2011). It is hoped that manifesting these consumer motivations will lead to the implementation of food consumption with pro-social values.

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