Asia-Pacific Journal of Food Safety and Security

OPEN ACCESS

ISSN 2422-9555

Volume 4, Issue 2 (http://apjfss.wix.com/apjfss)

2050SCIENCE PUBLISHERS
Solutions to Global Challenges

April – June 2018

Special Issue Sustainability in Food Technology

Theme: *Food Sustainability*

Editorial

Innovation as the key driver for sustainable food systems

Dayang Norulfairuz Abang Zaidel

School of Chemical and Energy Engineering, Faculty of Engineering, Universiti Teknologi Malaysia, Johor Bahru, Malaysia

***Corresponding author's email address:** dnorulfairuz@utm.my

Received: July 1, 2018/ Accepted: July 11, 2018/ Published online: July 19, 2018

Academic Editors: William Riley and Malik A. Hussain

To cite this article:

Zaidel, D.N.A. (2018). Innovation as the key driver for sustainable food systems. *Asia-Pacific Journal of Food Safety and Security*, 4(2), 1-4.

Highlights

- Four main goals in sustainable food development include ending hunger, achieving food security, improving food nutrition and promoting sustainable production.
- Innovation in food technology and processing is one of the key drivers that can significantly contribute to meeting the needs of the human population and at the same time ensure the sustainability of food systems in the future.
- Fourth Industrial Revolution has huge potential to revolutionize the food systems by improving the food supply chain and creating more effective food production.

About Author

Dr. Dayang Norulfairuz Abang Zaidel is a senior lecturer at the School of Chemical and Energy Engineering, Faculty of Engineering, Universiti Teknologi Malaysia in Johor Bahru, Malaysia. She is an active member of Food and Biomaterial Engineering Research Group (FoBERG) and Asia Pacific Institute of Food Professionals. Her research focus is on food processing and technology, food rheology, food nutrition, and green technology involving enzymes.

Food systems provide food products and services that are essential to humanity, but at the same time affect the environment and ecosystem. As the world is facing serious issues in global population growth, climate change and natural resource scarcity, the food industry is challenged to ensure enough food to feed the human population. Globally, 4 billion tonnes of food are produced, and this is expected to increase more than 60% to feed at least 9 billion population by 2050 (FAO, 2009). By looking closely into this issue, technology is playing an important role in finding solutions to ensure sustainable food systems development. There are four main goals in sustainable food development which include ending hunger, achieving food security, improving food nutrition and promoting sustainable production. In achieving these goals, food systems need to be; i) inclusive – including economic and social aspects, ii) sustainable – minimizing negative environmental impacts, conserving scarce natural resources, saving biodiversity loss and strengthening resiliency against future shocks, iii) efficient - producing adequate quantities of nutritious and healthy foods for global needs while minimizing loss and waste, and iv) nutritious and healthy – providing and promoting the consumption of diverse nutritious and safe foods for a healthy diet (WEF, 2018).

Innovation in food technology and processing is one of the key drivers that can significantly contribute to meeting the goals of a sustainable food supply. This includes meeting both the quantity (to ensure production and delivery of sufficient food for all) and quality (includes the provision of safe and nutritious food for healthy and sustainable diets) of food. For instance, development of probiotic beverages as functional food that could provide sustainable health solutions, design of new food processing that could minimize food consumption while maximizing the nutrient content of food, recycling of food waste into biofuels and biochemicals that could reduce environmental impact, innovation in food technology tools such as urban farming tools and environmentally friendly food solutions, and many more to come.

Almost one-third of global food production (approximately 1.3 billion tonnes) is lost along the supply chain or wasted by consumers and retailers (WEF, 2018). Innovative food supply chains need to be highlighted to address the issue of food waste and thus promote sustainability in food systems. This may also include better land management, lower pollution and better hygiene during processing, usage of safe and sustainable packaging, reduced discrepancies in supply-demand, creation of consumer trust for food products, use of bio-fertilizers, and waste segregation and composting (Zaidel, 2017).

Recently, the Fourth Industrial Revolution (4IR) has attracted the attention of many researchers and food industry players. The 4IR combines artificial intelligence and data technology as a new solution to address mainly industrial and social issues by integrating digital and physical fields. The 4IR technologies have huge potential to revolutionize food systems by improving the food supply chain and creating more effective food production. Figure 1 shows the combinations of 4IR that can enable innovation to solve challenges faced in food systems. For example, innovation in precision agriculture such as yield monitoring, diagnosing insect pests, measuring soil moisture, diagnosing harvest time, and monitoring crop health status, which will allow improvements in the agriculture

sector (Sung, 2018). Other emerging technologies, such as sensor technology for food safety, non-thermal pasteurization and sterilization, nano- and micro technology, development of novel preservation alternatives, extending the shelf life of fresh products, alternative processes requiring less energy or water, plant-based meat alternatives and many more, are possible as well.

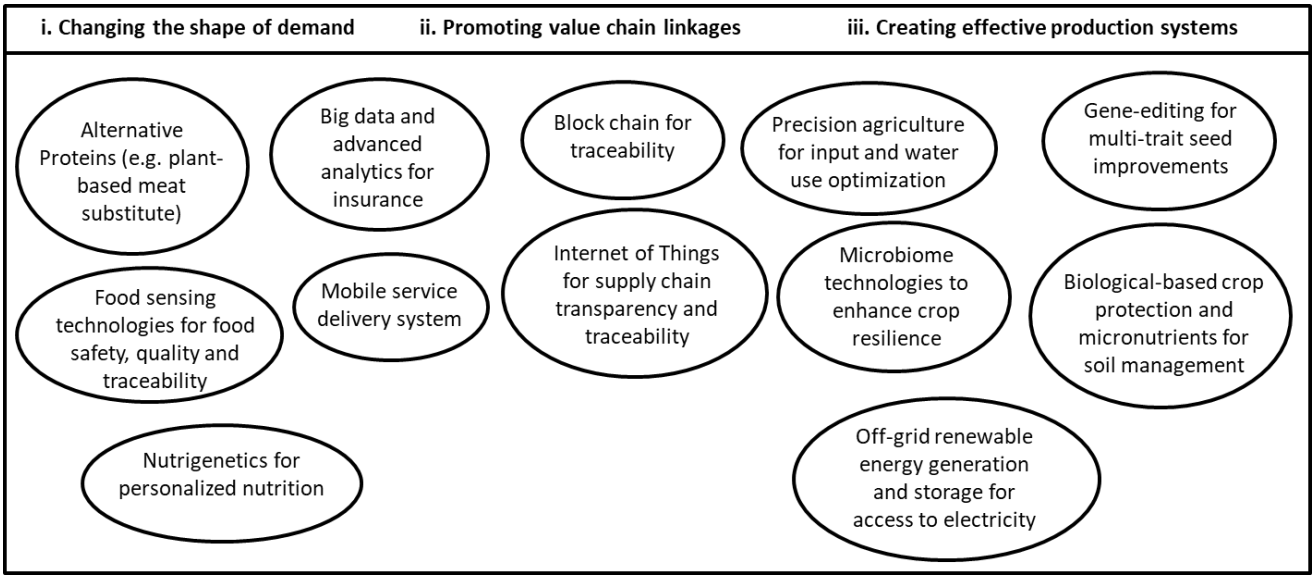

Figure 1. Combinations of 4IR technologies that enable innovation for solving challenges faced in food systems (adapted from WEF, 2018).

There are no limits when it comes to innovation. New challenges will always be faced when it comes to creating new technologies in order to address the issues of global food security. Two-way communications between the public and private sectors are very important to ensure an effective way of sharing information and creating new technologies. It is now important for us to start thinking towards sustainability in food technology and what we can do to help our future generations.

References

FAO [Food and Agriculture Organization]. (2009). How to feed the world 2050. Food and Agriculture Organization of the United Nation. Available online: http://www.fao.org/news/story/en/item/35571/icode/ (Accessed on 28 June 2018).

Sung, J. (2018). The fourth industrial revolution and precision agriculture. In Hussmann, S. (eds.). Automation in agriculture, Securing food supplies for future generations. Available online: http://dx.doi.org/10.5772/intechopen.71582 (Accessed on 1 July 2018).

WEF [World Economic Forum]. (2018). Innovation with a purpose: The role of technology innovation in accelerating food systems transformation.
Available online: http://www3.weforum.org/docs/WEF_Innovation_with_a_Purpose_VF-reduced.pdf. (Accessed on 28 June 2018).

Zaidel, D.N.A. (2017). Sustainability of food resources and the supply chain. *Asia-Pacific Journal of Food Safety and Security*, 3(2), 1-3.
