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Opinion
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Trends and Future Research in Food Science

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Opinion

The interdisciplinary approach to food science has led continuous improvement in food safety, wholesomeness, and quality. Food science is generally classified into food chemistry, food microbiology, food analysis, food engineering, and food processing. Over the last few decades, these areas have been more advanced and specified by the application of new technologies. Food Science has been rapidly changed with developing other areas such as molecular biology, biochemistry, biotechnology, genetics, and statistics. The most important areas for the food industry in the future could be assumed through the understanding of current development in food science and technology [1].

Analytical instruments such as infrared spectroscopy (IR), gas chromatography mass spectroscopy (GC/MS), liquid chromatography mass spectroscopy (LC/MS), and nuclear resonance spectroscopy (NMR) have dramatically improved the qualitative and quantitative methods for analyzing unknown chemical structures in foods. NMR is one of the promising tools to evaluate food safety and quality. In general, NMR can be used to identify toxicants, determine the content of ingredients, and determine the purity of food products. In future, the advanced analytical technology will be further required to flavor industry. The control of flavor development will be one of the most interesting parts in food processing. Therefore, a selective, sensitive, and rapid tool will be essential in flavor chemistry. Electronic nose is to simulate human nose, which is a group of sensors responding to volatile compounds. Volatiles bind to sensors in the electronic nose and then sensors send to a computer to determine flavor characteristic. Electronic nose will be used to differentiate sensory quality by rapid detection of flavors. The development of electronic nose would be considerable impact on food quality in terms of sensorial properties [2].

Since foodborne pathogens cause serious health problems, rapid detection method of foodborne pathogens has been necessarily required to food industry, specifically meat industry. Recently, polymerase chain reaction (PCR) has been known as the most powerful tool for detecting foodborne pathogens in molecular biology. PCR technique benefits on enhancing food safety. Because of its effectiveness and rapidness, PCR has been continuously developed and mostly used for detecting foodborne pathogens in food products. Quantitative PCR (QPCR) is another genetic molecular technique to provide identification and enumeration of pathogens. Reverse transcription-PCR (RT-PCR) is a new detection tool that RNA is converted into complementary DNA (cDNA) by reverse transcriptase. PCR is more rapid, sensitive, and specific, compared to the conventional tools. PCR technique can be a superior tool for the control of food safety. Nevertheless, a more rapid and accurate detection tool will be still needed to improve food safety in the future. Therefore, novel biosensor would be developed to quickly and accurately detect and quantify contaminated pathogens in meats and other foods. The ideal biosensor can quantify total foodborne pathogens and also specific pathogens. Novel biosensor would significantly enhance the food safety as well as protect human health [3].

Genetically modified (GM) foods have attributed to solve the food shortage problem and also provided many other benefits such as faster growing, lower in cost, improved sensorial properties, nutritional content, and yield. GM foods are considered as new food category, which has been produced by genetic technique taking target DNA from animal, plant, insect, or fish and inserting it into another. Although GM food has the potential and significant improvements in the food quantity, the safety issue of GM foods is continuously in debating all around world. Thus, food scientists and technologists have to more intensively consider GM food safety and environmental concerns and also have to minimize the risks by performing proof tests. In addition, consumers still have safety concern on irradiated foods and genetically modified (GM) foods because of the formation of toxic byproducts and potential risks to human health. Irradiated foods and GM foods can cause undesirable, unintended, and unpredictable problems. This will lead to irradiated foods and GM foods being clearly

leveled. As a result, in the future, reliable and convenient detection methods would be needed to differentiate between irradiated and non-irradiated and between GM foods and non-GM foods. Novel detection tools called GM and/or irradiated food detectors would be used as safety indicators against irradiated foods and GM foods [4].

For food safety control, Hazard Analysis and Critical Control Point (HACCP), was established for meat and poultry processing plants. A systematic approach of HACCP is to provide a preventive system of quality control and ensure food safety, which reduces the risk of microbiological contamination, chemical hazard, and physical hazard during production, processing, handling, distribution, storage, and preparation to use. Good Manufacturing Practice (GMP) is another important control system to prevent health hazards in poor quality and poor safety from raw material to finished product. Quality standards are applied for GMP to consistently produce and control the products. GMP is to produce the safety and reliable foods, which satisfy the consumers' expectation. GMP is used in combination with ISO-9000 as well as HACCP for accuracy and double assurance. HACCP and GMP are guideline for controlling food quality and safety. The rule of HACCP would protect consumers as well as manufacturers. Therefore, the HACCP would become more important part in the future [5].

With the growing interest in food safety, organic food grown without pesticides, herbicides, or artificial fertilizers will extensively increase in the future. Organic fruits, vegetables, grains, dairy products, and meats will be more popular food category. Ultimately, the development of organic foods will definitely protect future generation from diseases and environmental destruction. New rules and strict regulations will be also established for organic food certification. According to these rules and regulations, organic foods will be grown and processed without the use of synthetic compounds, radiation, and biotechnology. In addition, genomic technology will give a significant impact on food and nutritional science in the future, which is called nutrigenomic. With more information of genetic profiles, potential dietary diseases will be precisely predicted and effectively controlled in the molecular level. A genomic tool can provide a new understanding of the interaction between food and health. Nutrigenomic technology would help to make functional food designed to individual genetic trait that will help reduce cancer, cardiovascular, diabetes, arteriosclerosis, and other chronic diseases [6].

Conclusion

In conclusion, current technologies and systems will be more appropriately modified and improved, and new state of the art technologies will be continuously invented in the future. With the growing concern in human health, new products and technologies concerned with food safety and quality control will be primarily developed in all food areas associated with food science and technology, which include flavor detector, biosensor, contaminant detector, safety guideline, natural foods, and nutritious products.

References

1. Ohlsson T (2003) Reports provide insight into future of food science research. Trends in Food Science & Technology 14: 123-124.
2. Wasilewski T, Migoń D, Gębicki J, Kamysz W (2019) Critical review of electronic nose and tongue instruments prospects in pharmaceutical analysis. Analytica Chimica Acta 1077: 14-29.
3. Ye Y, Guo H, Sun X (2019) Recent progress on cell-based biosensors for analysis of food safety and quality control. Biosensors and Bioelectronics 126: 389-404.
4. Loo JFC, But GWC, Kwok HC, Lau PM, Kong SK, et al. (2019) A rapid sample-to-answer analytical detection of genetically modified papaya using loop-mediated isothermal amplification assay on lab-on-a-disc for field use. Food Chemistry 274: 822-830.
5. Hu K, Liu J, Li B, Liu L, Gharibzahedi SMT, et al. (2019) Global research trends in food safety in agriculture and industry from 1991 to 2018: A data-driven analysis. Trends in Food Science & Technology 85: 262-276.
6. Reddy V, Palika R, Ismail A, Pullakhandam R, Reddy G (2019) Nutrigenomics: Opportunities and challenges for public health nutrition. Indian Journal of Medical Research 148: 632-641.

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