Using the Multispectral imaging for Predicting the Water Status in Mushroom and Moisture Content and Water Holding Capacity in Cooked Pork Sausages

廖頌賢 (5139)

Outline

1. Introduction
2. Multispectral imaging for predicting the water status in mushroom during hot-air dehydration
3. Potential use of multispectral imaging technology to identify moisture content and water-holding capacity in cooked pork sausages
4. Conclusion

Abstract

Moisture as general component of food, it can maintain the texture and appearance of food, but it will also become a condition for the growth of microorganisms. Therefore, moisture form and content are used to the detection indicators of factories. In traditional technology, drying method and LF-NMR are mostly used. But these methods are very time-consuming, so the purpose of this research is to use multispectral imaging technology (wavelength range from 405 to 970nm) to detect moisture content, status and water holding capacity. The results show that the best predictive model for detecting the moisture form of mushrooms during drying is BPNN, with R^2_P of 0.9369 and RMSEP of 0.2291%. In addition, for cooked pork sausages, the best models for monitoring moisture content and water retention are PLSR combining spectrum and texture data of PC1, and PLSR combining spectrum and texture data of PC2, respectively. Its r_p is 0.948 and 0.832. In conclusion, The prediction model established by the use of multispectral image technology can accurately predict the moisture content, status and water holding capacity.

Reference

Antmann, G., Ares, G., Lema, P., & Lareo, C. (2008). Influence of modified atmosphere pack- aging on sensory quality of shiitake mushrooms. *Postharvest Biology and Technology, 49*(1), 164–170.

Ayadi, M. A., Kechaou, A., Makni, I., & Attia, H. (2009). Influence of carrageenan addition on turkey meat sausages properties. *Journal of Food Engineering, 93*(3), 278–283.

Chen, C., Wang, R., Sun, G., Fang, H., Ma, D., & Yi, S. (2010). Effects of high pressure level and holding time on properties of duck muscle gels containing 1% curdlan. Innovative *Food Science and Emerging Technologies, 11*(4), 538–542.

Dissing, B. S., Papadopoulou, O. S., Tassou, C., Ersbøll, B. K., Carstensen, J. M., Panagou, E.Z., & Nychas, G.-J. (2013). Using multispectral imaging for spoilage detection of pork meat.*Food and Bioprocess Technology, 6*(9), 2268–2279.

Guo, X., Xia, C., Tan, Y., Chen, L., & Ming, J. (2014). Mathematical modeling and effect of various hot-air drying on mushroom (Lentinus edodes). *Journal of Integrative Agriculture, 13*(1),207–216.

Li, M., Wang, H., Zhao, G., Qiao, M., Li, M., Sun, L., . . . Zhang, J. (2014). Determining the drying degree and quality of chicken jerky by LF-NMR. J*ournal of Food Engineering, 139*, 43–49.

Liu, C., Liu, W., Lu, X., Ma, F., Chen, W., Yang, J., & Zheng, L. (2014b). Application of multispectral imaging to determine quality attributes and ripeness stage in strawberry fruit. *PloS One, 9*(2), e87818.

Ma, F., Zhang, B., Wang, W., Li, P., Niu, X., Chen, C., & Zheng, L. (2018). Potential use of multispectral imaging technology to identify moisture content and water-holding capacity in cooked pork sausages. *Journal of the Science of Food and Agriculture, 98*(5), 1832–1838.

Walde, S. G., Velu, V., Jyothirmayi, T., & Math, R. G. (2006). Effects of pretreatments and drying methods on dehydration of mushroom. *Journal of Food Engineering, 74*(1), 108–115.

Younas, S., Liu, C., Qu, H., Mao, Y., Liu, W., Wei, L., Yan, L., & Zheng, L. (2020). Multispectral imaging for predicting the water status in mushroom during hot-air dehydration. *Journal of Food Science, 85*(4), 903–909.

Xiong, C., Liu, C., Pan, W., Ma, F., Xiong, C., Qi, L., . . . Zheng, L. (2015). Non-destructive determination of total polyphenols content and classification of storage periods of Iron Buddha tea using multispectral imaging system. *Food Chemistry, 176*, 130–136.