Understand the impact of different pretreatments on fruit drying through microstructure

王彥婷 (5152)

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Outline

1. introduction
2. Ethanol and blanching pretreatments change the moisture transfer and physicochemical properties of apple slices via microstructure and cell-wall polysaccharides nanostructure modification
3. Effects of blanching on drying characteristics, quality, and pectin nanostructures of dried cut-persimmons
4. Conclusion

Abstract

Vegetables and fruits are easily spoiled during transportation and cause waste, so someone came up with a drying method to store it. However, traditional hot air drying takes a long time, so pretreatment is required to prevent changes in color, texture, etc. Pretreatment was performed using high-humidity hot air impingement blanching (HHAIB), normal blanching (at 95℃ for 2 min), and ethanol pretreatment. Ethanol pretreatment mainly reduced the internal resistance of moisture diffusion, and the cell wall structure became loose, thereby increasing the permeability. Blanching caused the structural collapse, as well as the depolymerization and β-elimination degradation of cell wall polysaccharides. No matter which pretreatment method is used, the drying rate and drying time decrease compared with the control group. The effects of blanching and drying on pectin to examine the relationships between these processes and hardening. The observed changes in Galacturonic acid (GalA) contents suggested that water-soluble pectin (WSP) was converted to chelator-soluble pectin (CSP) by the blanching step, and that CSP and diluted alkali-soluble pectin (DASP) were converted to WSP by the drying step. Scientists hypothesize that the changes that occurred during drying were caused by enzymatic digestion because the heating temperature was not high enough to inactivate the relevant enzymes. In terms of the color, the lowest browning index was found in ethanol pretreated samples with drying temperature of 80℃. After blanching, all dried samples had lower a* values than the dried samples. Blanching caused a greater effect on carotenoid degradation than was observed after drying the results confirmed that this pretreatment can enhance the mass transfer, improve the quality profile, and food safety. This study on the relationships between pectin nanostructures and textures can serve for controlling of the textures of dried fruits by manipulating processes, such as blanching and drying.

Reference

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