

Effect of acetic acid treatment on salt permeability and microstructure of egg shells ⁽¹⁾

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Abstract

The purpose of this study was to evaluate the effect of acetic acid treatment on the salt permeability of egg shells, and to establish a technique of egg processing. White Leghorn chicken eggs were used. The eggs were randomly divided into an experimental group treated with 5% acetic acid for 30 min and a control group, and eggshell microstructure and quality were determined. The results showed that microstructure of the eggshell surface experimental group was relatively uneven, and the eggshell strength was significantly decreased ($P < 0.05$). Then, the eggs of two groups were soaked in 20% salt solution. The salt concentrations of egg white were detected at days 0, 7, 14, and 21. The results showed that the salt permeability of the eggs, treated with 5% acetic acid, was significantly increased ($P < 0.05$). The eggs of two groups were boiled and soaked in pickling solution for 15 days under 4°C to produce flavored eggs. From the 6th day of soaking, the salt concentration of egg yolk and egg white in the acetic acid group was significantly higher than the control group ($P < 0.05$). Analyzed the components and detected the sensory evaluation of the flavored egg. The results showed that the components were no significant difference between the two groups. In the sensory evaluation, the total acceptance of the experimental group tended to be higher than the control group ($P = 0.07$). In conclusion, the egg pre-treated with 5% acetic acid for 30 min could increase the permeability of salt for eggshell. The manufacturing procedure can be used in shell egg processing.

Key words: Eggshell, Permeability, Acetic treatment.

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