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Synergistic Effects of Plasma and Organic Acids on Safety and Quality of Pork Loin

Hag Ju Lee*, Sethukali Anand Kumar, Dongbin Park, Dong-Gyun Yim, and Cheorun Jo

Department of Agricultural Biotechnology, Seoul National University, Seoul, Korea

This study aimed to investigate the effectiveness of combining plasma and organic acid treatments on the safety and quality of pork loin. The concentration of organic acid (0.5% and 1.0%) and plasma treatment (60 min) were determined through preliminary study. Pork loin was immersed in plasma-activated acetic acid, lactic acid, citric acid solution (PAA, PLA, and PCA, respectively) for 10 min and analyzed for antimicrobial activity and quality. Compared to non-plasma treated control group, PLA and PCA did not provide additional bactericidal effect on *Salmonella* Typhimurium, *Escherichia coli* O157:H7, and *Listeria monocytogenes*, regardless of their concentration. In contrast, 0.5% PAA showed a higher bacteria reduction, only except for *L. monocytogenes*, possibly due to the increase in H₂O₂ and O₃ concentration in 0.5% PAA solution. Meanwhile, organic acid and plasma treatment could induce negative effect on the quality of pork loin, especially color and lipid/protein oxidation. However, in this study, PAA minimized the adverse effect on its quality compared to the other plasma-treated organic acids. Therefore, 0.5% PAA can be effective way to control microbial contamination in the meat without significant quality deterioration during storage.