

ABSTRACT

The demand and consumption of milk and its derived products in Indonesia are gradually increasing over the years. However, pasteurization as the predominant technology used in Indonesia's dairy industries fails to meet consumer demands on high quality liquid milk, especially long shelf life milk with low microbial content. Therefore, various non-thermal technologies are explored and investigated, including cold plasma. Argon-based cold plasma has successfully produced ESL (Extended Shelf-life) milk with good sensory characteristics. However, since argon is used, there are concerns regarding the projected cost of treatment for scaling up this technology in food industry. Therefore, the effectivity of nitrogen in substituting the expensive noble gas was investigated in this project. Fresh milk obtained from Tunghai Farm was processed using different treatments encompassing cold plasma periods (0, 1, 5, and 10 minutes) and/or pasteurization. The chemical (titratable acidity, pH, and color) and microbiological quality of samples were analyzed every 6 days over 21 days of storage at 4°C. Results indicated cold plasma and/or pasteurization process produced milk with higher whiteness index than raw milk. In terms of titratable acidity, pH, and microbial growth, milk processed with 10 minutes cold plasma and HTST (p10) had the slowest rate of quality deterioration. Nevertheless, it is still not as effective as the antimicrobial activity of argon-based cold plasma. Through implementing longer period of nitrogen cold plasma, better chemical and microbiological quality might be observed and extended shelf life of milk could be achieved.

Keywords: *milk, cold plasma, pasteurization, shelf life, microbiological quality.*