

Impact of microbial growth on frozen meat based on defrost time and freeze-thaw process

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ABSTRACT

Introduction: Contamination can occur with good practice of food storage but with poor handling. However by leaving it to defrost and through multiple cycle of defrosting and refreezing, there is an increase in bacterial count. Thus, objective of this study was to determine the correlation between growth of bacteria and defrost time interval and number of freeze thaw cycles.

Materials and methods: This experimental study was conducted in Microbiology Lab, Universiti Kuala Lumpur Royal College of Medicine Perak (UniKL RCMP). Two types of meats were used in this study which are beef and chicken. After defrosting, a meat cubes were allowed to stand at room temperature and chopped into little pieces. One inch incisions were made in the refrozen meat and streaked on nutrient agar and incubated for 24 hours at different one-hour time interval; 1, 2, 3 and 4 hours. Nutrient and MacConkey agar medium were used for both Gram positive and negative bacteria to assess their growth. Experiment was repeated two times after 24 and 48 hours. Bacterial growth was counted using colony forming unit (CFU) and their characteristics properties were identified using gram staining, catalase test, coagulase test and qualitative biochemical test. The results were analysed by using SPSS. **Results and conclusion:** The colony count was significantly increased in every defrosting time interval and also in second cycle ($p < 0.01$). Based on the tests provided, *Staphylococcus aureus*, Coagulase negative *Staphylococcus aureus* (ConS) and *Salmonella* species were identified from both red and white meat. Therefore, we conclude that defrosting and refreezing process at different time intervals accelerated growth of bacteria to be increased significantly on meat.