Uji Toksisitas Nanokitosan dari Limbah Selongsong Maggot BSF (*Hermetia illucens*) Sebagai Bahan Aktif *Hand Sanitizer* (*Toxicity Test of Nanochitosan from BSF Maggot (Hermetia illucens) Casing Waste as an Active Ingredient in Hand Sanitizer*) Supervisor: Dr. Titik Budiati, S.TP., M.T., M.Sc.

Meilya Indrawati
Study Program of Food Engineering Technology
Majoring of Agricultural Technology

ABSTRACT

BSF maggot casings contain chitin which can be extracted into chitosan and nanochitosan. Nanochitosan has antibacterial properties so it has the potential to be used as an active ingredient of hand sanitizer. This study aims to determine the characteristics of chitosan and nanochitosan, the toxicity effect of applying nanochitosan hand sanitizer from BSF maggot casings to the skin and its effect on the skin cell regeneration process. The characteristics of chitosan and nanochitosan were analyzed by FTIR, SEM, TEM, PSA, and Zeta potential. Visual observation to determine the toxicity effect of nanochitosan hand sanitizer and histological observation of skin tissue to determine its effect on skin cells. The results of chitosan characterization have met SNI with pH 7, water content 5.58%, ash content 0.41%, nitrogen content 6.98%, deacetylation degree (DD) 81.75% and yield 30%. The characteristics of nanochitosan based on SEM and TEM tests are in the form of small granules, PSA test shows an average particle size of 670 nm with a PI of 0.564, and a zeta potential value of -30.2 mV. Nanochitosan hand sanitizer has a pH value between 5-6. Based on observations of toxicity effects, there were no differences in body weight, abnormal behavior changes or death in mice, no signs of irritation appeared after applying nanochitosan hand sanitizer to the skin of mice and histology results showed no cell damage to normal skin, wounds or skin of hyperglycemia mice indicating the presence of toxicity characteristics. The application of nanochitosan hand sanitizer to wound skin is known to contribute to the wound closure process based on skin tissue histology. So it can be said that nanochitosan hand sanitizer products are non-toxic and safe when used on the skin.

Key words: *BSF maggot casings, nano chitosan, hand sanitizer, toxicity*