EXTRACTION OF COLLAGEN FROM THE CONNECTIVE TISSUE OF IMMUNOCASTRATED PIGS TESTICLES USING FRACTIONAL FACTORIAL DESIGN

Gislaine Silveira Simões¹,², Expedito Tadeu Facco Silveira³, Elza Iouko Ida², Massami Shimokomaki¹*

¹Department of Food Science and Technology, Londrina State University, Londrina, PR, Brazil
²Federal Institute of Parana, Campus Jacarezinho, Jacarezinho, PR, Brazil
³Institute of Food Technology, Meat Technology Center, Campinas, SP, Brazil
* mshimo@uel.br

In pork production chain, male animals are castrated to prevent the unpleasant odor in the carcass. The immunological castration of pigs has been applied in many countries as an efficient technology to control the undesirable odor and ensure animal welfare. With the application of this technology there is a need to have a beneficial application of their testicles. These organs are surrounded by a thick capsule tissue, called the tunica albuginea, composed of collagen fibers. Collagen is widely used in the, medicine, cosmetic and food industries because of its technological properties. The objective of this study was to extract pepsin solubilized collagen from the connective tissue of immunocastrated pigs testicles by applying fractional factorial design (2⁴⁻¹). Four independent variables were investigated (X₁= mol L⁻¹ acetic acid; X₂= h of treatment with acetic acid; X₃= % enzyme and X₄= h of enzymatic digestion), with three levels of variation with a total of eleven experiments. The dependent variable was Y= % collagen quantified by the method of hydroxyproline. The raw material presented 17.7% of collagen. It was observed that X₂ had no significant effect (p>0.05) in the extraction of pepsin-soluble collagen. The other variables showed significant positive effect (p<0.05). The variables X₁ and X₃ showed significant positive interaction (p<0.05). Analyzing the response surface it was observed an increase in the collagen extraction with the highest values of X₁, X₃ and X₄, and the maximum content collagen extracted was 75%.