

Nuntaporn Aukkanit 2007: Collagen Extraction from Silver-line Grunt Skin and Some Characteristics of Extracted Collagen. Master of Science (Food Science), Major Field: Food Science, Department of Food Science and Technology. Thesis Advisor: Associate Professor Wunwiboon Garnjanagoonchon, Ph.D. 76 pages.

Collagen extraction from fresh silver-line grunt skin was carried out by using 0.5 M acetic acid combined with pepsin at a concentration of 0.1% (w/v) for 6 hours at 28°C. Collagen was precipitated by adjusting NaCl in the solution to a concentration of 0.9 M. The ratios of skin to acetic acid (g/ml) were tested at 1:10, 1:15, 1:20 and 1:25. The results showed that the yield of collagen decreased as ratio of skin to acid increased. Therefore, the ratio 1:10 was used for collagen extraction at different temperatures (4, 10, 20 and 28°C) for 6 hours. The extraction at 10°C with acid ratio at 1:10 gave the highest yield (439.32 mg/ g skin dry basis). The SDS-PAGE pattern of extracted collagen was type I collagen which comprised β α 1 α 2 chains. Extraction of fish skin at high temperatures (20 and 28°C) resulted in the formation of low molecular weight peptide fragments due to the rapid rate of acid and pepsin digestion which cannot be precipitated by 0.9M NaCl and gave a low yield of extracted collagen. The denaturation temperature of extracted collagen at 4°C is 39.5°C which is higher than that extracted at 10°C which the denaturation temperature is 37.5°C. The denaturation temperature of extracted collagen at 20 and 28°C could not be detected due to its high composition of low molecular weight peptide fragments. The study of collagen self-assembly showed that collagen extracted at 10°C gave the highest rate of collagen self-assembly. Examination of the structure of reconstructed collagen by confocal laser scanning microscope indicated that the fibril diameter of extracted collagen at 10°C is 0.5 μ m which is larger than that extracted at 4°C (fibril diameter is 0.41 μ m) within the same incubation time of collagen self-assembly (4 hours). The fibrils had a larger diameter when increase incubation time.

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