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**INTERNATIONAL CONFERENCE ON QUALITY
IMPROVEMENT AND DEVELOPMENT OF FOOD PRODUCT
(QID-Food 2015)**

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The Characteristics of Chicken Legs Skin Gelatin with Combination of Acetic Acid Concentration and Immersion Time

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ABSTRACT

Gelatin is a denaturalized protein that is derived from collagen by acidic or alkaline hydrolysis and is an important functional biopolymer that has a very broad application in many industrial fields. This research was aimed to determine the effect of combination between acetic acid concentration and immersion time on characteristics of chicken legs skin gelatin. The experiment used Completely Randomized Design (CRD) with two factors and three replicates of treatment. The first factor was concentration of acetic acid solution, consisted of (1, 3 and 5 %). The second factor was immersion time in acetic acid (12, 24 and 36 hours). The result showed that concentration acetic acid solution had no significant effect ($P>0.05$) on the pH value but had significant effect ($P<0,01$) on the yields, gel strength, viscosity, pH value and water content of chicken legs skin gelatin. The immersion time had no significant effect ($P>0.05$) on the pH value, yields, gel strength and viscosity of gelatin. The best characteristics of chicken legs skin gelatin was produced from 3 % acetic acid concentration and 24 hours immersion time.

Keywords : Acetic acid, gelatin, chicken legs skin and immersion time.



THE CHARACTERISTICS OF CHICKEN LEGS SKIN GELATIN WITH COMBINATION OF ACETIC ACID CONCENTRATION AND IMMERSION TIME

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Introduction

Gelatin is a denaturalized protein that is derived from collagen by acidic or alkaline hydrolysis and is an important functional biopolymer that has a very broad application in many industrial fields. The quality of gelatin depends on its physicochemical properties, rheological properties and manufacturing method. Gelatin has been applied within the food, pharmaceutical, medical, cosmetic and photographic industries because of its unique functional (Karim and Bath, 2008). Most gelatins are currently made from beef bone and hide, different species of fish (Gomez-Estaca et al., 2009). Scientists has been doing many research of gelatin from pigskin (Sompie et al., 2012), from goat skin (Said et al., 2011), and gelatin from tunafish skin (Gudmundsson, 2002). Gelatin production required a curing step to improve quality of gelatin. Curing materials from the group of acids have been widely applied in gelatin production. Effect of acetic acid concentration and immersion time to produce gelatin from chicken skin was limited information. Thus, this research was conducted to study the effect of combination between different concentration acetic acid solution and immersion time on characteristics of chicken leg skin gelatin.

Materials and Methods

Materials. Five thousand g chicken leg skin were used as a raw material, acetic acid solution (CH₃COOH 0,5M), and distilled water.

Preparation of gelatins. Gelatine was prepared by the acid extraction method (Ockerman and Hansen, 2000). Acetic acid (CH₃COOH 0.5M) concentrations of 1%, 3% and 5% (v/v) were used as a treatments. The raw material were soaked at different time immersion of acetic acid solution 12 hours, 24 hours and 36 hours. After soaked, samples were neutralized to pH 6, weighed and extracted. The extraction process were performed on three steps (each step for 3 hours), the first step at 500C, second step at 550C and then at 600C. Solubilized gelatin was separated from residual skin fragments by filtration through a nylon filter. The extracted gelatin was concentrated at 700C for 5 hours and it was stored in the refrigerator 5-100C for 30 minutes, then dried at 600C for 24-36 hours until the gelatin sheet solid. Gelatin sheets were milled and packaged in vacuum plastic and stored in a desiccator for subsequent process.

Experimental Design and Data Analysis. The experiment were determined by analysis of Completely Randomized Design (Steel and Torrie, 1991) with two factors and three replicates of treatments. The first factor was concentration of acetic acid solution consisting of 3 levels (1, 3 and 5 percents). The second factor was different immersion time consisting of 3 levels (12, 24 and 36 hours). The significant differences of the average were determined using Duncan's new multiple range test.



Results and Discussion

Parameters	Immersion (hours)	Acetic acid (%) + Sd			Average
		1	3	5	
Yields (%)	12	12.10±0.05	14.42±0.02	14.22±0.01	13.58±0.02 ^a
	24	12.31±0.03	12.55±0.21	13.12±0.11	12.66±0.03 ^a
	36	12.01±0.07	13.21±0.10	14.21±0.14	13.14±0.03 ^a
	Average	12.14±0.02 ^c	13.39±0.05 ^d	13.87±0.23 ^e	
Gel Strength (g/Bloom)	12	64.84±0.62	65.81±0.56	66.07±0.65	65.67±0.21 ^a
	24	64.16±0.40	66.02±0.02	67.09±0.81	65.75±0.11 ^a
	36	64.12±0.17	66.09±0.91	66.44±0.21	65.21±0.01 ^a
	Average	64.37±0.17 ^c	65.96±0.02 ^d	66.53±0.21 ^e	
Viscosity (%)	12	5.70±5.37	4.43±1.04	4.28±2.034	4.80±8.16 ^b
	24	5.50±1.12	4.40±5.11	4.30±1.105	4.73±8.31 ^b
	36	4.50±0.16	4.41±1.14	4.27±1.972	4.39±9.01 ^a
	Average	5.23±5.15 ^c	4.41±3.79 ^d	4.28±3.72 ^e	
pH Value	12	5.26±0.08	5.28±0.17	5.31±0.08	5.28±0.54 ^a
	24	5.33±0.10	5.26±0.12	5.23±0.48	5.27±1.33 ^b
	36	5.23±0.34	5.25±0.56	5.30±0.16	5.26±0.43 ^b
	Average	5.27±0.62 ^c	5.29±0.06 ^c	5.28±0.63 ^c	

Different letters in the same row and column indicated the significant differences (P<0,05)

Conclusion

Chicken leg skin gelatin from with concentration of acetic acid 1, 3 and 5% had similar characteristics to the commercial gelatin. The best characteristics of chicken legs skin gelatin was produced from 3% acetic acid concentration and 24 hours soaking time.

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