

EFFECTS OF PROPOLIS ON STORAGE STABILITY AND SENSORY EVALUATION OF CHICKEN PATTY

Gyutae Park¹, Sanghun Park¹, Yunhwan Park¹, Sehyuk Oh¹, Nayoung Choi¹, Youngho Lim¹, Taeyeon Moon² and Jungseok Choi^{1*}

¹Department of Animal Science, Chungbuk National University, Republic of Korea

² Orge, Agricultural corporation, Republic of Korea

*Corresponding author email: jchoi@chungbuk.ac.kr

I. INTRODUCTION

Chicken contains high-quality, easily digestible proteins and a high ratio of unsaturated fatty acids [1]. However, chicken meat is a biological product subjected to microbiological activities and physiological and chemical changes [2]. So, synthetic additives are used to prevent lipid and protein oxidation [3]. However, consumers prefer food prepared with natural additives over synthetic additives for health reasons [4]. Bee products have long been used in traditional medicine and therapy [5]. Propolis among bee products has effects such as anti-inflammatory, antidiabetic, antibacterial and antioxidant activities [6]. In this study, different amounts of propolis were added to chicken patties, and the effects on sensory evaluation and refrigerated storage stability were investigated.

II. MATERIALS AND METHODS

Table 1 is the formulation of chicken patties with different concentrations of propolis. The refrigerated storage stability (4°C, 0-14 days) of chicken patties was investigated by performing volatile basic nitrogen (VBN), 2-thiobarbituric acid reactive substance (TBARS), and total microbial count (TMC). For sensory evaluation, 7 trained panelists subjectively evaluated 5 items (flavour, texture, juiciness, hardness and total preference). Data were analyzed using Duncan's Multiple Range Test to determine the differences between different concentrations.

Table 1. The formulation of a chicken patty with different concentrations of propolis

Item (g)	Treatments			
	CON	T1 (0.1%)	T2 (0.2%)	T3 (0.4%)
Chicken patty ¹	1,000	1,000	1,000	1,000
Propolis	0	1	2	4

¹Chicken patty : chicken breast (22.5%), chicken thigh (52.5%), chicken skin (5.7%), defatted soy protein (2.9%), water (11.4%), NaCl (1.2%) and ricebran powder (3.8%).

III. RESULTS AND DISCUSSION

Table 2 shows the results of storage stability of chicken patties with different concentrations of propolis. In the case of VBN, there was no significant difference between 0-7 days, but at 14 days, T3 showed a significantly lower value than CON. TMC was generally lower in T1, T2, and T3 treated with propolis than in the CON. Phenolic compounds in propolis have antibacterial and antioxidant activities [7, 8]. Therefore, it is considered that protein degradation and microbial growth of patties were inhibited.

Table 2. Storage stability (VBN, TBARS, TMC) of a chicken patty with different concentrations of propolis

	Storage (days)	Treatments				SEM	p-value
		CON	T1 (0.1%)	T2 (0.2%)	T3 (0.4%)		
VBN (mg/100g)	0	14.9	14.7	14.6	15.0	0.25	0.942
	3	17.4	16.9	16.5	16.8	0.16	0.286
	7	19.4	19.0	18.1	19.1	0.22	0.198
	14	21.0	21.1	20.7	20.0	0.16	0.028
TBARS (mg MDA/kg)	0	0.09	0.07	0.06	0.06	0.01	0.433
	3	0.10 ^B	0.13 ^B	0.24 ^A	0.10 ^B	0.02	<.0001

	7	0.15	0.15	0.10	0.11	0.01	0.377
	14	0.11	0.10	0.08	0.08	0.01	0.515
TMC (log cfu/g)	0	4.50 ^A	3.00 ^B	4.00 ^{AB}	4.53 ^A	0.24	0.034
	3	5.28 ^A	4.70 ^{AB}	4.30 ^B	4.59 ^B	0.15	0.017
	7	7.19 ^A	6.92 ^B	7.03 ^{AB}	6.85 ^B	0.04	0.014
	14	6.64 ^A	6.28 ^{AB}	6.01 ^B	6.56 ^A	0.10	0.049

^{A-B}Means with different superscriptions within the same row differ significantly ($p < 0.05$, $n = 3$).

Figure 1 show the results of sensory evaluation of chicken patties with different concentrations of propolis. The total preference score tended to decrease as the amount of propolis added increased. The addition of propolis is considered to have received a low score because it has a unique strong, unpleasant taste and odor [9].

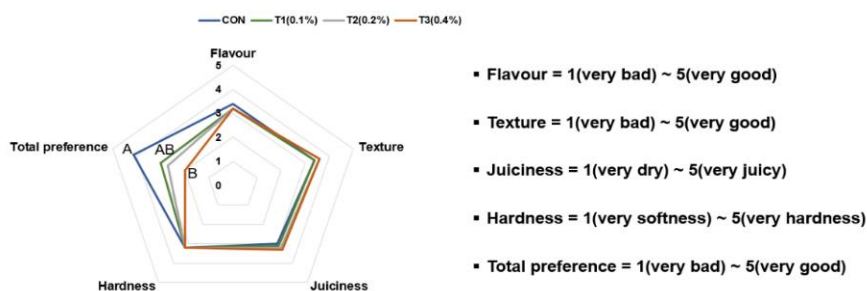


Figure 1. Sensory evaluation of a chicken patty with different concentrations of propolis. ^{A-B}Means with different letter differ significantly ($P < 0.05$)

IV. CONCLUSION

Addition of propolis to chicken patties improves refrigeration storage stability but degrades sensory properties due to its unique smell. Therefore, when using it, it should be considered at the 0.2% level. In addition, it is considered that propolis can be used as a natural additive in chicken products.

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