

# PHYSICOCHEMICAL AND TEXTURAL PROPERTIES OF CHICKEN BREAST SAUSAGES ADDED WITH DIFFERENT SALT LEVELS

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## I. INTRODUCTION

In meat products, fat and salt play a key role in emulsion stability and functionality enhancement. But excessive intake of them may be hazard factors for human health [1], [2]. As consumers are increasingly interested in health, there is much need for the development of low-fat and low-salt meat products [3]. Therefore, this study was conducted to evaluate physicochemical and textural properties of chicken breast sausages added with different salt levels (0.5, 1.0, 1.5, 2.0 and 2.5) and to find the optimal salt level.

## II. MATERIALS AND METHODS

Chicken breasts used in the manufacture of sausages was provided from local meat market in Gwangju, South Korea. The sausages were produced at different salt concentration (0.5, 1.0, 1.5, 2.0 and 2.5). pH, color, expressible moisture (EM, %), cooking loss (CL, %), textural profile analyses, total plate counts (TPC) and violet red bile (VRB)-agar for *Enterobacteriaceae* were measured. The whole experiment was repeated 3 times, and statistically analyzes were performed by one-way-analysis of variance (ANOVA) at the significant level of 0.05%.

## III. RESULTS AND DISCUSSION

Table 1 shows color values of chicken breast sausages, lightness tended to decrease with increasing salt concentration. pH (6.22~6.32), springiness (mm, 6.83 to 7.03), TPC and VRB were not different among treatments ( $P>0.05$ ). And, redness and yellowness values of chicken sausage less than 1.0% salt level were higher than those of the others ( $p<0.05$ ). This results might be contribute to water holding capacity (WHC).

Table 1 Color values of chicken breast sausages as affected by salt concentrations

		Treatments				
		0.5%	1.0	1.5%	2.0%	2.5%
L* (lightness)	Mean	82.4 <sup>a</sup>	80.5 <sup>b</sup>	80.1 <sup>bc</sup>	79.6 <sup>cd</sup>	79.2 <sup>d</sup>
	S.D.	0.34	0.48	0.34	0.30	0.45
a* (redness)	Mean	5.91 <sup>a</sup>	5.36 <sup>ab</sup>	5.03 <sup>b</sup>	4.99 <sup>b</sup>	4.74 <sup>b</sup>
	S.D.	0.46	0.37	0.22	0.36	0.35
b* (yellowness)	Mean	5.58 <sup>a</sup>	5.11 <sup>ab</sup>	4.79 <sup>b</sup>	4.78 <sup>b</sup>	4.92 <sup>b</sup>
	S.D.	0.50	0.36	0.13	0.14	0.04

As shown in Table 2, expressible moisture and cooking loss values tended to decrease moisture loss with increasing salt concentration ( $p<0.05$ ). Salt level higher than 1.5% showed low values in the most parameters, and 2.5% was the highest among the various salt levels ( $p<0.05$ ). This results indicate that the addition of salt reduces moisture loss during cooking.

Table 2 Expressible moisture and cooking of chicken breast sausages as affected by salt concentrations

		Treatments				
		0.5%	1.0	1.5%	2.0%	2.5%
Expressible moisture (%)	Mean	30.6 <sup>a</sup>	23.1 <sup>b</sup>	21.8 <sup>bc</sup>	20.9 <sup>bc</sup>	20.3 <sup>c</sup>
	S.D.	1.64	0.80	1.67	1.88	0.37
Cooking loss (%)	Mean	3.00 <sup>a</sup>	1.13 <sup>b</sup>	0.54 <sup>bc</sup>	0.33 <sup>c</sup>	0.27 <sup>c</sup>
	S.D.	0.61	0.48	0.16	0.08	0.01

Table 3 shows the results of texture properties. Chicken sausage containing the salt levels between 1.0 and 2.5% had hardness values twice as much as those with 0.5% ( $p < 0.05$ ). Gumminess and chewiness also showed significant difference, like the results of hardness. These data indicated that increased salt addition in sausage manufacture had a positive impact on sausage texture. Cohesiveness values of sausage with 0.5% salt level was the lowest ( $p < 0.05$ ) and the other salt concentrations were not different among other salt levels ( $p > 0.05$ ).

Table 3 Textural properties of chicken breast sausages as affected by salt concentrations

		Treatments				
		0.5%	1.0	1.5%	2.0%	2.5%
Hardness (gf)	Mean	6354 <sup>c</sup>	11995 <sup>b</sup>	13224 <sup>ab</sup>	12350 <sup>b</sup>	16893 <sup>a</sup>
	S.D.	133	2850	2431	974	2577
Gumminess	Mean	65.0 <sup>c</sup>	175 <sup>b</sup>	202 <sup>ab</sup>	188 <sup>b</sup>	290 <sup>a</sup>
	S.D.	5.23	64.6	54.5	21.6	74.4
Chewiness	Mean	443 <sup>c</sup>	1222 <sup>b</sup>	1375 <sup>ab</sup>	1312 <sup>b</sup>	1920 <sup>a</sup>
	S.D.	14.0	429	306	128	402
Cohesiveness	Mean	10.2 <sup>b</sup>	14.1 <sup>a</sup>	14.9 <sup>a</sup>	15.3 <sup>a</sup>	16.8 <sup>a</sup>
	S.D.	0.67	2.21	1.18	0.80	1.71

#### IV. CONCLUSION

As the salt level increased in the chicken sausage mixture, color values, expressible moisture and cooking loss decreased, but texture properties values increased. In this study, 1.5% salt concentration is the best condition in terms of health and functionality of chicken breast sausages. In future, sensory evaluation could be applied to have an optimum salt levels for the consumer.

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