

QUALITY PROPERTIES OF LOW FAT PORK SAUSAGE WITH ADDED BOVINE HEART SURIMI LIKE MATERIALS

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1. INTRODUCTION

Pork sausages are a widely consumed meat product throughout the world. However, the demand for healthier food products, especially low-fat products, is rapidly increasing, with the development of low- and reduced-fat meat products [1]. Surimi is defined as a concentrate of myofibrillar protein obtained after mincing and water washing of fresh meat from fish and other animal species. Surimi-like material (SLM) can be applied as a useful ingredient to manufacture low-fat meat products [2]. SLM from bovine heart can be used to produce low animal fat content meat products with extended texture and flavor [3]. Therefore, the aim of this study was to investigate the effect of SLM from bovine heart on the properties of low-fat pork sausage.

2. MATERIALS AND METHODS

The manufacture of sausage was accomplished with three batches for each treatment. For each batch of each treatment, 1.5 kg of sausages was prepared. Four different types of pork sausages were considered: 1) without animal fat and SLM (control), 2) added with 30% animal fat (T1), 3) added with 10% SLM (T2), and 4) added with 20% SLM (T3). Then sausages were cooked at 90°C for 40 min to keep an internal temperature of 75.5°C (CHS-76, Alto-Shaam Inc., FL, USA). After cooking, sausages were granted to cool at 4°C for 40 min for laboratory analysis by packaging with oxygen-permeable bags (polyethylene, Thai Griptech Co. Ltd., Bangkok, Thailand). All data from three replications were represented as mean \pm standard deviations. By using the SAS® software package, the data were analyzed. Analysis of variance (ANOVA) was utilized, and Duncan's multiple range tests ($P < 0.05$) were performed to evaluate the differences among the means.

3. RESULTS AND DISCUSSION

In this study, the pork sausage with T2, T3 and control had a significantly higher moisture and protein content than the T1 ($P < 0.05$). Some researchers demonstrated that SLM increased protein and moisture content, and decreased fat content [3]. The T3 treated sausage exposed a higher cooking yield than control and T1 sausage, whereas no significant differences were identified among all treatments ($P > 0.05$). The pork sausage with T1 and T3 exhibited significantly higher flavor score compared to those of T2 and control ($P < 0.05$). Panelists evaluated T2 and T3 sausages to be significantly more tender than control and T1 sausage ($P < 0.05$). Furthermore, T1, T2 and T3 treated sausage scored significantly higher overall acceptability than the control ($P < 0.05$). The overall acceptability of meat products was determined by regarding all sensory attributes, and meat products with added SLM had increased flavor, tenderness and overall acceptability scores [2]. Hardness, gumminess and chewiness were significantly lower in T1 and T3 samples than control and T2 samples ($P < 0.05$). However, no significant differences were detected among all treatments of cohesiveness and springiness ($P > 0.05$). Reduced level of fat could direct to unacceptable texture of meat products, and SLM containing meat products showed higher hardness, cohesiveness, springiness, gumminess and chewiness properties [2]

Table 1. Effect of surimi-like material from bovine heart on the proximate composition, cooking yield and sensory characteristics of low fat pork sausage

Treatments	Proximate composition			Sensory characteristics			
	Moisture (%)	Fat (%)	Protein (%)	Cooking yield (%)	Flavor	Tenderness	Overall acceptability
C	68.69 ^a	5.80 ^b	23.71 ^a	3.67	5.66 ^b	4.55 ^a	5.11 ^b
T1	54.36 ^b	27.81 ^a	16.18 ^b	2.16	6.59 ^a	4.01 ^a	6.10 ^a
T2	71.07 ^a	5.03 ^{bc}	22.58 ^a	2.90	5.77 ^b	5.13 ^b	6.21 ^a
T3	69.51 ^a	4.17 ^c	24.58 ^a	4.46	6.21 ^a	5.74 ^b	6.03 ^a

^{a-c}Means with different superscript in a column within each treatments are significantly different (P<0.05).

Table 2. Effect of surimi-like material from bovine heart on the texture profile analysis of low fat pork sausage

Treatments	Hardness (N)	Cohesiveness	Springiness	Gumminess	Chewiness (N)
C	6.69 ^a	0.37	0.85	2.48 ^a	2.11 ^a
T1	3.09 ^b	0.31	0.99	0.96 ^c	0.95 ^c
T2	5.13 ^a	0.33	0.89	1.69 ^b	1.50 ^b
T3	2.82 ^b	0.33	0.89	0.93 ^c	0.83 ^c

^{a-c}Means with different superscript in a column within each treatments are significantly different (P<0.05).

4. CONCLUSION

Pork sausage, especially manufactured with 20% SLM had a lower fat content, and exposed higher cooking yield, and flavor, tenderness and overall acceptability scores. Therefore, SLM made from bovine heart can be used to improve the quality properties of low fat pork sausage.

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