Study of Some Characteristics of Shang-do

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Introduction

Shang-do is a traditional Chinese meat product which was manufactured by pork ham and lard processing with grinding, curing, stuffing (porcine bladder), drying and aging. A shang- do, which surface like a red apple, can be tasted with steam cooking and slicing. This product is belonged to a semi-fermented and dry meat product and also is famous in Nanking, China. Not too much information about this product can be used for the studies. Some characteristics (moisture, crude fat, ash, pH value, water activity, total plate count and lactic acid bacteria count) of shang-do, therefore, were set up in this study.

Materials and Methods

The pork ham and lard were ground with a 1/6" plate and then adjusted different fat percentages (25% and 33%). The ground materials were mixed with salt, wine, nitrite, sodium polyphosphate, MSG, spices and sugar. The mixture was curing at 4 C for 2 days and then stuffed into a porcine bladder (average weight: 200g) and dried at 48-50 C for 48hrs then smoking for 2 hrs or not. The final products were put into an incubator (20 C) for aging (90 days). The chemical contents of shang- do were determined by AOAC 's method (1996). Water activity and pH of the products were measured with a super fast water activity instrument (CX-2, Pecagon Devices Inc.,) and a pH meter, individually. L, a and b value of the samples were measured with a colorimeter. Total plate count and lactic acid bacteria counts were performed by FDA's method (1995). All data in this study were analyzed by a statistical system of SAS (1996).

Results and discussions

The moisture and water activity of all shang-dos decreased with aging time increasing (Table 1 and 2) but the fat and ash of all products increased with aging time increasing. A stable condition of the chemical content of all shang-dos was found after one month during aging (Table 1). The pH value of all products increased slightly with aging time up at the 21st day then maintained stable (Table 3). The total plate count of all products reduced in initial aging time but kept stable after the 7th day during aging period (Table 4). L value of all samples decreased with aging time but a and b value increased with aging time (Fig. 1). The panel score aspects, unsmoked shang-do with higher fat percentage (33%) had the highest color and texture score but the highest flavor score was obtained by unsmoked shang-do with lower fat percentage (25%). However, The highest total acceptance score of the product in all was unsmoked shang-do with higher fat percentage in this study (Table5).

Conclusions

Shang do is belonged to a slightly higher pH but lower water activity meat product. The products can be kept in a stable quality condition at aging or on sale for over 3 months. A defect of this product is too salty, so a low salt product will be done in the further.

References

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Table 1 Analysis of moisture of shang-do with different fat additions and smoking during aging

	Fat addition			
	25 %		33 %	
Aging (day)	Unsmoking	Smoking	Unsmoking	Smoking
0	54.33 ± 0.86^{ax}	55.36 ± 0.51^{ax}	56.99 ± 0.34^{ax}	54.38 ± 1.30^{ax}
4	35.93 ± 3.64^{bxy}	41.64 ± 1.00^{bx}	34.66 ± 1.04^{by}	32.81 ± 1.90^{by}
7	33.76 ± 0.78^{bx}	28.42 ± 0.50^{dz}	30.83 ± 0.32^{cy}	29.45 ± 0.52^{cyz}
14	29.29 ± 0.79^{cx}	31.31 ± 1.15^{cx}	28.02 ± 2.48^{cdx}	30.54 ± 2.20^{bcx}
21	29.97 ± 1.49^{cxy}	30.21 ± 0.23^{cx}	28.71 ± 1.17^{cy}	26.06 ± 1.24^{dz}
28	28.19 ± 2.73^{cxy}	29.16 ± 2.27^{cdx}	26.26 ± 1.06^{dy}	22.50 ± 2.92^{dez}
60	23.87 ± 1.34^{dy}	27.83 ± 2.84^{cdx}	26.82 ± 1.77^{cdx}	22.99 ± 1.80^{ey}
90	22.36 ± 1.31^{dx}	24.05 ± 1.09^{ex}	24.76 ± 1.06^{dx}	21.90 ± 2.08^{ex}

a, b, c, d and e Means within the same column without the same superscripts are significantly different ($P<0.05$)

x, y and z Means within the same row without the same superscripts are significantly different ($P<0.05$).

Table2 Analysis of water activity of shang-do with different fat additions and smoking during aging

	Fat addition			
	25 %		33%	
day	Unsmoking	Smoking	Unsmoking	Smoking
0	0.97 ± 0.01^{ax}	0.96 ± 0.01^{ax}	0.96 ± 0.01^{ax}	0.96 ± 0.01^{ax}
4	0.89 ± 0.00^{bx}	0.91 ± 0.01^{bx}	0.91 ± 0.00^{bx}	0.91 ± 0.00^{bx}
7	0.88 ± 0.01^{by}	0.91 ± 0.00^{bx}	0.87 ± 0.01^{cy}	0.83 ± 0.01^{cz}
14	0.83 ± 0.00^{cy}	0.84 ± 0.01^{dx}	0.85 ± 0.00^{cx}	0.81 ± 0.01^{dz}
21	0.83 ± 0.01^{cx}	0.84 ± 0.01^{dx}	0.81 ± 0.01^{dy}	0.83 ± 0.01^{cx}
28	0.83 ± 0.00^{cy}	0.86 ± 0.00^{cx}	0.85 ± 0.00^{cx}	0.84 ± 0.01^{cxy}
60	0.81 ± 0.00^{dy}	0.84 ± 0.01^{dx}	0.80 ± 0.00^{dy}	0.80 ± 0.00^{dy}
90	0.80 ± 0.00^{dy}	0.83 ± 0.00^{dx}	0.80 ± 0.01^{dy}	0.81 ± 0.00^{dy}

Table 3 Analysis of pH value of shang-do with different fat additions and smoking during aging

	Fat addition			
	25 %		33 %	
Day	Unsmoking	Smoking	Unsmoking	Smoking
0	6.03 ± 0.02^{bx}	6.05 ± 0.02^{bx}	6.01 ± 0.02^{cx}	6.07 ± 0.04^{abx}
4	6.05 ± 0.02^{bx}	6.12 ± 0.05^{ax}	6.09 ± 0.01^{bx}	6.11 ± 0.02^{ax}
7	6.11 ± 0.03^{abx}	6.09 ± 0.06^{abxy}	6.10 ± 0.03^{abx}	6.00 ± 0.02^{cy}
14	6.10 ± 0.05^{abx}	6.10 ± 0.05^{abx}	6.08 ± 0.04^{bcx}	6.03 ± 0.02^{bx}
21	6.13 ± 0.07^{abx}	6.10 ± 0.02^{ax}	6.03 ± 0.02^{cy}	6.16 ± 0.10^{ax}
28	6.14 ± 0.01^{ax}	6.11 ± 0.03^{ax}	6.11 ± 0.03^{abx}	6.14 ± 0.07^{ax}
60	6.16 ± 0.02^{ax}	6.12 ± 0.03^{ax}	6.12 ± 0.03^{abx}	6.13 ± 0.06^{ax}
90	6.16 ± 0.02^{ax}	6.10 ± 0.03^{ax}	6.16 ± 0.06^{ax}	6.09 ± 0.03^{ax}

Table 4 Analysis of total plate count(CFU/g) of shang-do with different fat additions and smoking during aging

	Fat addition			
	25 %		33 %	
day	Unsmoking	Smoking	Unsmoking	Smoking
0	5.79 ± 0.11^{ax}	5.90 ± 0.03^{ax}	5.90 ± 0.13^{ax}	6.10 ± 0.08^{ax}
4	4.50 ± 0.03^{bz}	4.69 ± 0.05^{bz}	5.18 ± 0.03^{by}	5.48 ± 0.14^{ax}
7	4.65 ± 0.04^{bx}	4.69 ± 0.13^{bcx}	4.78 ± 0.19^{cx}	4.71 ± 0.23^{bx}
14	4.22 ± 0.10^{cx}	4.48 ± 0.11^{cx}	4.64 ± 0.40^{cx}	4.48 ± 0.13^{bx}
21	4.33 ± 0.06^{cx}	4.36 ± 0.11^{cx}	4.29 ± 0.09^{dx}	4.43 ± 0.18^{bx}
28	4.57 ± 0.27^{bcx}	3.89 ± 0.16^{dy}	3.76 ± 0.26^{ey}	3.75 ± 0.12^{cy}
60	4.34 ± 0.06^{cx}	3.37 ± 0.04^{ey}	3.64 ± 0.21^{ey}	3.45 ± 0.17^{cdy}
90	3.88 ± 0.07^{dx}	3.37 ± 0.10^{ey}	3.24 ± 0.09^{ey}	3.35 ± 0.12^{dy}

Table 5 Analysis of panel score* of shang-do with different fat additions and smoking

	Fat addition			
	25 %		33 %	
Items	Unsmoking	Smoking	Unsmoking	Smoking
Color	5.00 ± 1.41	3.83 ± 0.94	4.50 ± 1.45	3.92 ± 1.24
Texture	4.75 ± 1.22	3.83 ± 0.83	4.25 ± 1.22	4.08 ± 1.00
Flavor	4.42 ± 1.14	3.58 ± 1.08	4.58 ± 1.24	4.00 ± 1.54
Salty	3.92 ± 1.43	3.00 ± 1.48	3.33 ± 1.61	3.75 ± 1.54
Total Accept	4.42 ± 1.62	3.25 ± 1.06	4.25 ± 1.36	3.67 ± 0.98

* A 7 point system is used in this study. 1- extremely dislike , 7- extremely like.

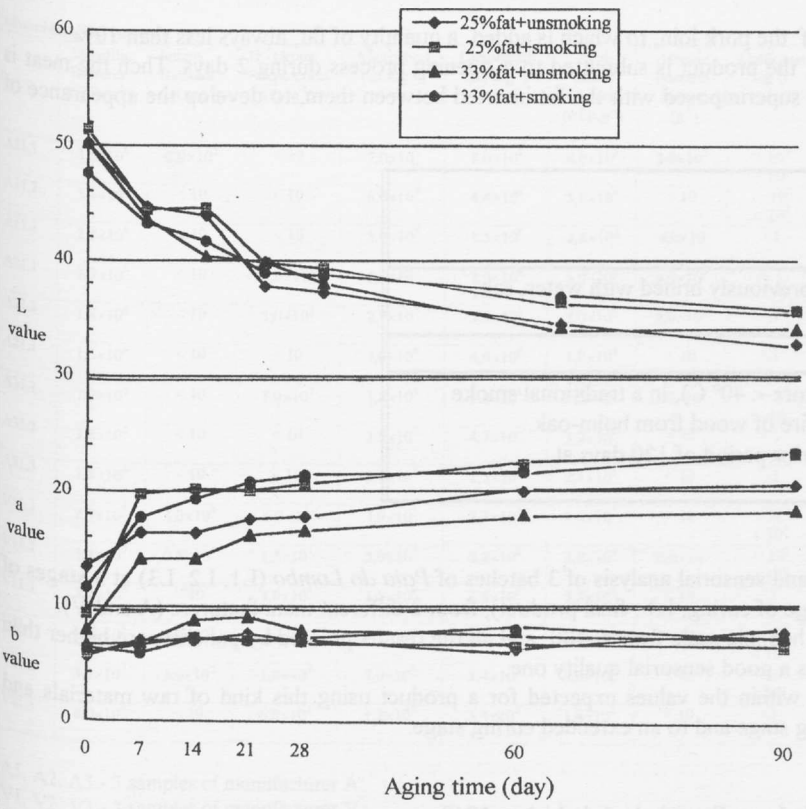

Figure 1 Change of L, a and b value of shang-do with different fat additions and smoking during aging period.