

LIPID OXIDATION AND DEGRADATION DURING DRYING AND STORAGE OF CHINESE GUANGDONG BACON

F.Y. Bai¹, S. G. Guo¹, A.M.Jiang^{1*}, R.Liu¹, Z.J.Liao², Y.H.He², X.M.Shao², Q.Z.Yi²

¹ College of Food Science, South China Agriculture University, Guangzhou, Guangdong Province, China, 510642,

² Group of Dongjin Agriculture Herd, Huizhou, Guangdong Province, China, 516300

Key words: Chinese Guangdong bacon, acid value, peroxide value, drying, storage

Introduction

Lipid oxidation often spoils Guangdong bacon and is characterized by acid value and peroxide value. With people pay close attention to the food safety, the improved sanitation standard of Chinese bacon (2005) was published. Whether or not Chinese Guangdong bacon produced in the current process accords with the new standard and what was the relation between variety of acid value and peroxide value during the process and storage are deserved to be researched for providing a science theory about accelerating continual development of Chinese Guangdong bacon.

Materials and Methods

The roasting and solarizing Chinese bacon separately fetched from Group of Dongjin Agriculture Herd, Huizhou, Guangdong province. The drying sample was determined everyday, and idle and vacuum packaging sample, temperature maintaining 10°C, room temperature (10-32°C), 30°C, separately, was measure per 20 days. The roasting sausage was dried in the drying-house in which temperature maintained about 60°C at days and went down to 30-40°C at nights, and the solarizing sausage was dried in natural condition, temperature maintaining 10-40°C.

Acid value was measured according to the method of GB/T5009.44 and sample handled according to GB/T5009.44. Determination of peroxide value was accorded to GB/T 5009.37. All experiments were performed in triplicate. The statistical analysis software was Microsoft office Excel 2003. The ANOVA tables obtained were further analyzed for the comparison of means by Least Significant Difference procedures.

Results and Discussion

Triglyceride can oxidate and hydrolyze for the effect of enzyme (Johansson, G., et al, 1996) which influence food quality. Fig 1 and 2 show that acid value and peroxide value of Chinese bacon ascends remarkably in the drying process ($P<0.05$) and accord the standard. Spanish dry-cure sausage and Chinese sausage showed similar result in drying process (Fanco I, et al, 2002; Cai, et al, 2000). The acid value and peroxide value of sausage kept on rising in different storage condition (see from table 1 and 2). Vacuum and low temperature can significantly inhibit lipid oxidation during storage ($P<0.05$). Acid value and peroxide value had correlation ship and coefficient correlation (R^2) was 0.9147.

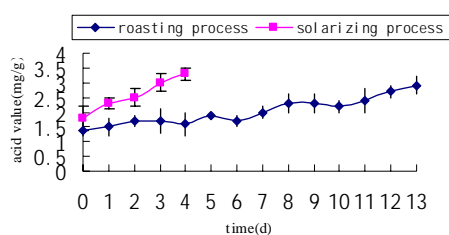


Figure 1 Variety of acid value in the roasting and solarizing process of Chinese bacon

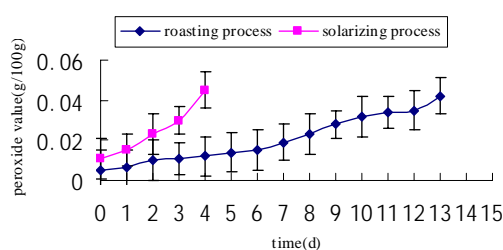


Figure 2 Variety of peroxide value in the roasting and solarizing process of Chinese bacon

Table 1 Variety of acid value in the storage of Chinese bacon

<i>storage</i>	<i>0d</i>	<i>20d</i>	<i>40d</i>	<i>60d</i>
Solarizing sausage				
Idle stuff and room temperature	3.3±0.1 ^a	3.4±0.0 ^a	3.8±0.0 ^{ab}	4.0±0.0 ^{ab}
Idle stuff and 10°C	3.3±0.1 ^a	3.4±0.0 ^a	3.4±0.0 ^a	3.8±0.1 ^a
Idle stuff and 30°C	3.3±0.1 ^a	5.5±0.1 ^{ab}	6.8±0.0 ^b	7.1±0.0 ^b
Vacuum and room temperature	3.3±0.1 ^a	3.5±0.0 ^a	3.6±0.0 ^a	4.2±0.0 ^b
Vacuum and 10°C	3.3±0.1 ^a	3±0.0 ^a	3.3±0.0 ^a	3.5±0.0 ^a
Vacuum and 30°C	3.3±0.1 ^a	4.2±0.0 ^{ab}	4.7±0.0 ^b	5.4±0.0 ^c
Roasting sausage				
Idle stuff and room temperature	2.9±0.1 ^a	3.8±0.0 ^{ab}	4.1±0.0 ^{ab}	
Idle stuff and 10°C	2.9±0.1 ^a	3.3±0.0 ^{ab}	3.8±0.0 ^b	
Idle stuff and 30°C	2.9±0.1 ^a	5.6±0.0 ^{ab}	7.1±0.0 ^b	
Vacuum and room temperature	2.9±0.1 ^a	3.5±0.0 ^{ab}	4.3±0.1 ^b	
Vacuum and 10°C	2.9±0.1 ^a	3.1±0.1 ^a	3.7±0.0 ^{ab}	
Vacuum and 30°C	2.9±0.1 ^a	5.4±0.1 ^{ab}	6.9±0.1 ^b	

^{a, b, c}: Values with identical letters in the same column are not significantly different at P>0.05.

Table 2 Variety of peroxide value in the storage of Chinese bacon

<i>storage</i>	<i>0d</i>	<i>20d</i>	<i>40d</i>	<i>60d</i>
Solarizing sausage				
Idle stuff and room temperature	0.045±0.001 ^a	0.085±0.001 ^{ab}	0.1±0.001 ^b	0.12±0.001 ^{bc}
Idle stuff and 10°C	0.045±0.001 ^a	0.077±0.000 ^{ab}	0.088±0.002 ^{ab}	0.097±0.000 ^{ab}
Idle stuff and 30°C	0.045±0.001 ^a	0.097±0.003 ^{ab}	0.12±0.001 ^b	0.13±0.002 ^{bc}
Vacuum and room temperature	0.045±0.001 ^a	0.057±0.001 ^a	0.068±0.001 ^a	0.071±0.003 ^a
Vacuum and 10°C	0.045±0.001 ^a	0.049±0.001 ^a	0.054±0.001 ^a	0.059±0.000 ^a
Vacuum and 30°C	0.045±0.001 ^a	0.064±0.003 ^a	0.079±0.005 ^a	0.075±0.001 ^a
Roasting sausage				
Idle stuff and room temperature	0.042±0.001 ^a	0.08±0.000 ^{ab}	0.11±0.000 ^b	
Idle stuff and 10°C	0.042±0.001 ^a	0.74±0.000 ^{ab}	0.096±0.001 ^{ab}	
Idle stuff and 30°C	0.042±0.001 ^a	0.1±0.000 ^{ab}	0.14±0.004 ^b	
Vacuum and room temperature	0.042±0.001 ^a	0.059±0.000 ^a	0.069±0.002 ^a	
Vacuum and 10°C	0.042±0.001 ^a	0.05±0.000 ^a	0.058±0.000 ^a	
Vacuum and 30°C	0.042±0.001 ^a	0.063±0.001 ^a	0.075±0.001 ^a	

^{a, b, c}: Values with identical letters in the same column are not significantly different at P>0.05.

Conclusions

Methods of drying influence the quality of Guangdong bacon in which roasting improved the bacon quality. Oxidation and degradation of fat intensified in the storage, which was influenced obviously by drying way, packaging mode and storage temperature. Acid value may be the critical factor that impacts on the quality of Chinese Guangdong bacon.

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