



1. 450046 2. 454450

摘要: NaCl KCl MgCl₂

0.5% KCl 0.5% 2.0% 1.0% NaCl
50% NaCl
L* a*
NaCl 4 5 6
P 0.05

关键词:

Effect of Low-Sodium Salt on Quality of Beef Meatballs

FU Li¹, ZHANG Xiufeng¹, DANG Meizhu^{1,*}, YANG Baojin¹, HUANGPU Youyu²

(1.College of Food Engineering, Henan University of Animal Husbandry and Economy, Zhengzhou 450046, China;

2.Henan Yisai Beef Co. Ltd., Jiaozuo 454450, China)

Abstract: In this paper, the thawing loss, cooking loss, water activity, texture, color, aerobic plate count and sensory quality of frozen beef meatballs added with different combinations of sodium chloride, potassium chloride, magnesium chloride, potassium lactate and yeast extract as low-sodium salts were determined. The aim was to evaluate the effect of low-sodium salt on the flavor, texture and storability of meatballs. The results showed that the optimum combination was 1.0% NaCl, 0.5% KCl, 0.5% potassium lactate and 2.0% yeast extract, which led to a 50% reduction of NaCl content in meatballs. Additionally, the thawing loss, cooking loss, chewiness, water activity, *L** and *a** values of meatballs with the low-sodium salt were similar to those observed with the addition of NaCl alone, and the microbiological indices were within the national standard limit. The gelling properties of other combinations were significantly better compared with the control group (*P* < 0.05). Furthermore, the addition of a certain amount of yeast extract could effectively improve the bad taste caused by potassium.

Key words: low-sodium salt; beef meatballs; potassium chloride; texture; potassium lactate

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[1-4]

[5-6]

6 g^[7-8]

12 g

2

[9-10]

26%

2017-07-12

2016

161100110700

HUAHE2015010

1971

E-mail ful071512@163.com

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1984

E-mail 249454290@qq.com



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表1 各组产品中盐类物质的添加量

Table 1 Control (NaCl alone) and combinations of salts with yeast extract

	2.0% NaCl				
1	1.0% NaCl	0.3% KCl	0.3% MgCl ₂	0.4%	1.0%
2	1.0% NaCl	0.5% KCl	0.5% MgCl ₂	1.0%	
3	1.0% NaCl	0.5% KCl	0.5% MgCl ₂	2.0%	
4	1.0% NaCl	0.5% KCl	0.5%	1.0%	
5	1.0% NaCl	0.5% KCl	0.5%	2.0%	
6	1.0% NaCl	0.4% KCl	0.4% MgCl ₂	0.2%	1.0%

5 4

2

表2 牛肉丸的感

2 h

1

$$\text{解冻损失}/\% = \frac{m_1 - m_2}{m_1} \times 100$$

1

m_1 /g /g m_2

90

70

2

$$\text{蒸煮损失}/\% = \frac{m_3 - m_4}{m_3} \times 100$$

2

m_3 /g /g m_4

50%

CT3

TA-AACC36

TA-DEC

2.00 mm/s

1.00 mm/s

1.00 mm/s

10 g

50% 2

2 cm

C

$$Y=89.2 \quad x=0.315 \quad y=0.322$$

L^*

a^*

b^*

GB 4789.2—2016

[26]

8

4

2 3 6
 P 0.05
 P 0.05 5
 P 0.05
 NaCl
 Gou ^[17]

1 4 5
 P 0.05

表 3 不同处

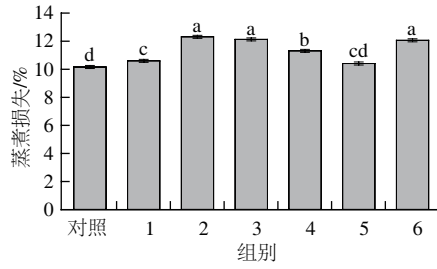


图 2 不同处理组牛肉丸的蒸煮损失

2.3

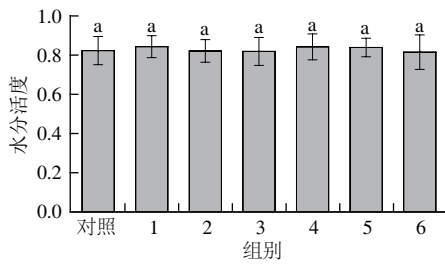


图 3 不同处理组牛肉丸的水分活度

3
 0.823
 0.839
 P 0.05
 P 0.05
 0.821 0.819 0.815
 P 0.05
 2 3 6
 1 4 5
 0.843 0.842
 0.9
 60 d
^[9]

2.4

L^* a^*
 3
 P 0.05
 P 0.05
 b^*
 5 6
 KCl
 L^*
 4 5 6
 a^*
 5
 P 0.05
 1
 5



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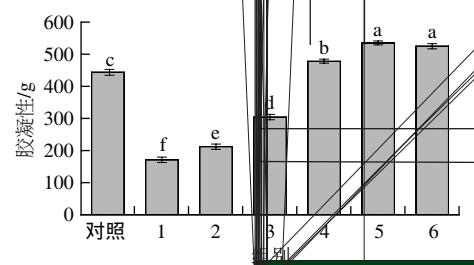
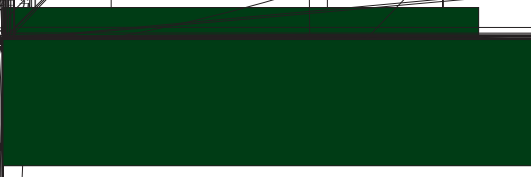


图3 不同工艺组



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