

INFLUENCE OF THE LACTATE ON THE MICROBIOLOGICAL AND SENSORY PROPERTIES IN SEMIDURABLE SAUSAGES

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This paper presents the influence of the lactate on the microbiological and sensory properties of semi-durable sausage. The addition of lactate a favorably affect the microbiological picture of the total number of bacteria and the sensory properties of semi-durable sausage. The addition of lactate preserved the sensory properties of the treated samples with lactate and their extended period of use.

Key words: lactate; microbiological image; sensory properties; semi-durable sausage

ВЛИЈАНИЕ НА ЛАКТАТИТЕ ВРЗ МИКРОБИОЛОШКИТЕ И СЕНЗОРНИТЕ СВОЈСТВА НА ПОЛУТРАЈНИ КОЛБАСИ

Во овој труд е испитувано влијанието на лактатите врз микробиолошката слика и сензорните особини на полутраен народен колбас. Додавањето на лактатите поволно влијае на микробиолошката слика во однос на вкупниот број бактерии и на сензорните особини на народниот колбас. Додатокот на лактат ги зачувал сензорните особини на третираните примероци и им го продолжил рокот на употреба.

Клучни зборови: лактат; микробиолошка слика; сензорни карактеристики; полутраен колбас

INTRODUCTION

Extending the durability of meat products propound a request before producers and processors to introduce new technological barriers for reproduction of the microorganisms. The challenge of achieving security and control product is tied to the manner and conditions of manufacture and the storage and distribution of products in order to obtain a quality and safe product. Meat products are perishable products and therefore are looking for ways to maintain and extend its. For this purpose it is used, citrate, acetate, lactate individually or in combination. The addition of lactate to the product in the processing effectively retained in the development of microorganisms whit acidic environment. Rapid reduction of the pH leads to termination of the life activities of microorganisms penetrate lactate addition in microbial cells and stop processes sharing them. As a result, morphological

changes occur (Dragoev, 2004; Paul et al., 2007). Besides bacteriological effect and the lactate contribute to better profitability arising from the impact of reducing Kahlo production during thermal processing and storage of meat products. Moreover, lactate positively affect the reduction of color, texture, flavor and aroma products (Bloukas et al., 1997). The addition of 1 to 2% sodium lactate in vacuum packaged fresh pork sausages were continued for 14 days duration (Brewer et al., 1993). The impact of potassium lactate and type of fresh pork sausage fresh light and darkness in the area studied by Schmidt et al. (2009). They examined the influence of potassium and sodium lactate in different combinations on minced beef meat packaged in modified atmosphere and stored at 2°C and 8°C. Determined that the addition of lactate in all combinations at improving the microbiological and sensory characteristics in the treated samples compared with untreated. Ramanathan and

Mancini (2008) confirmed the positive effect of lactate on the color stability of meat and meat products. Because there are not or very little information on the impact of lactate on the sausages, we decided to examine the impact of lactate on microbiological image (total number of bacteria) and sensory properties of the sausages.

MATERIAL AND METHOD

As material for examination we have used the type: semi-durable sausage "National". Sausage was produced by all veterinary sanitary regulations which apply to R. Macedonia (Gazette of RM, No. 63/2013) is classified as a rough-hewn boiled semi-durable sausage. Sausage was produced from fresh pork and beef, dietary additives and spices. Two samples were prepared, one standard – without lactate, and other with lactate. Lactate was added to the product during the grinding in the amount of 2% compared to the weight of the product. After filling up and hanging the sausage was measured and it was heated by the following formula.

Thermal processing: 35 min of drying at 62°C, 20 min of smoking at 62°C, 35 min of digestion at 78°C. After heat treatment a vacuum type machine Vebomatik was using. After vacuum sausage is stored at + 4°C and 6°C. Of these samples is examination microbiological (total number of bacteria) and sensory properties.

Microbiological examination

For bacteriological examination material was taken from each sample – 20 g of material which before planting is homogenized with 180 ml sterile distilled water from which is made other dilutions. The number of bacteria is in log.CFU/g. It was examined the total number of bacteria in the method ISO 4833/2008. The test was performed immediately after charging to thermal treatment after the first heat treatment day, 15, 45, 55 and 65 days from the manufacture .

Sensory examination

Sensory examination are made using a quantitative descriptive test of numerical descriptive scale shown in Table 1 on a scale of 1 to 5. Assessed following sensory attributes: external appearance, color, smell, taste, consistency. The evaluation was performed by a 5 experienced spe-

cialists. Sensory examination was performed 1, 15, 45, 55 and 65 days production.

Table 1

Total number of bacteria (log / CFU/g) test specimens stored at temperature of 4°C and 6°C

Days	Untreated samples		Treated samples	
	4°C	6°C	4°C	6°C
Immediately after charging	5.42	5.75	4.20	4.50
1 day of production	5.50	5.58	3.45	3.90
15 days of production	5.58	5.82	3.90	3.70
45 days of production	5.65	5.85	4.20	4.85
55 days of production	5.78	6.58	4.55	5.12
65 days of production	6.80	7.20	4.98	5.42

Statistical processing

The obtained results have processed mathematical statistics using Microsoft Excel 2003 and his standard accessory Data Analysis Tool Pak.

RESULTS AND DISCUSSION

The table shows that untreated control samples stored at temperature 4°C and 6°C had the highest values of the total number of bacteria. After filling immediately the number of bacteria determined in untreated samples stored at 4°C and 6°C was 5.42 and 5.75 log / CFU/g. A treated with 4.20 and 4.50 log / CFU/g. The 1, 15, 45 and 55 and 65 days production total number of bacteria in untreated samples kept at a temperature of 4°C and 6°C increases by 5.50 and 5.58 log / CFU/g. to 6.80 and 7.20 log / CFU/g the 65th day of storage. Treated samples stored at temperature 4°C and 6°C had a total number of bacteria 4.20 and 4.0 log / CFU/g immediately after charging the 65 days of storage had a total number of bacteria 4.98 and 5.42 log / CFU/g. The differences between the values obtained at 1, 15 and 45 days production in sausages stored at 4°C and 6°C between the control sample and treated samples are statistically significant ($p > 0.05$).

Crossing the limits at 7.0 log/CFU/g occurs in untreated samples kept at a temperature of 6°C to 65 days. The table shows that untreated control samples stored at temperature 4°C and 6°C had the

highest values of the total number of bacteria and compared values of the treated samples is probably due to the application of lactate in their production.

Sensory analysis

Tables 2 and 3 show at the first day to the 45 days haven't significant deviations of sensory characteristics in both groups studied sausages kept at a

temperature of 4°C and 6°C. Significant differences were observed after 55 days of storage with the greatest deviation in samples without addition of lactate. Samples with added lactate is a well rated in all evaluated sensory properties of the samples without addition of lactate which confirms the contention of some authors that lactate positively affect the reduction of color, texture, flavor and fragrance products (Bloukas et al. 1997).

Table 2

Sensory analysis of tested samples kept at a temperature of 4°C

Sensory properties	D a y s									
	Untreated samples					Treated sample				
	1	15	45	55	65	1	15	45	55	65
Color section	8,20±0,10	7,40±0,12	6,70±0,20	5,45±0,20	4,48±0,20	8,78±0,05	8,58±0,20	7,90±0,25	6,78±0,18	5,80±0,28
Smell	8,12±0,25	7,28±0,12	6,40±0,18	5,28±0,52	4,42±0,28	8,55±0,48	8,42±0,18	7,58±0,22	6,55±0,12	5,72±0,10
Taste	8,40±0,12	7,20±0,18	6,20±0,42	5,20±0,48	4,28±0,40	8,58±0,12	8,72±0,42	7,58±0,48	8,88 ± 0,20	5,55±0,40
Consistency	8,72±0,28	7,42±0,42	6,20±0,10	5,25±0,20	4,28±0,50	8,88±0,20	8,78±0,45	7,58±0,72	6,58±0,52	5,70±0,20

Table 3

Sensory analysis of tested samples kept at a temperature of 6°C

Sensory properties	D a y s									
	Untreated samples					Treated sample				
	1	15	45	55	65	1	15	45	55	65
Color section	7,80 ± 0,20	7,20±0,18	6,50±0,28	5,10±0,10	4,20±0,42	8,70±0,10	8,52±0,25	7,70±0,28	6,80±0,10	5,50±0,58
Smell	8,05±0,25	7,10±0,18	6,28±0,20	5,18±0,28	4,58±0,72	8,40±0,48	8,42±0,18	7,58±0,22	6,48±0,15	5,55±0,52
Taste	8,18±0,22	7,42±0,42	6,12±0,52	5,05±0,12	4,72±0,12	8,50±0,42	8,72±0,42	7,58±0,48	6,48±0,22	5,28±0,72
Consistency	8,25±0,28	7,22±0,42	6,20±0,10	4,82±0,18	4,20±0,52	8,80±0,22	8,42±0,40	7,58±0,22	6,85±0,78	5,18±0,12

The color samples without addition of lactate had little stability after and got low grades in samples kept at a temperature of 4°C and 6°C compared to samples with addition of lactate kept the same temperatures probably due to the action of lactate which positively affect the color of meat and meat products (Püssa et al., 2009). On days 55 to 65 samples without addition of lactate at all tested sensory properties received low marks as a result of declining quality of sensory attributes with the greatest departure in samples not containing lactate held at a temperature of 6°C .

CONCLUSION

With the addition of lactate production in the semi-durable sausage is visible improvement the microbiological and sensory evaluation. In sausages treated with lactate interesting is the appearance of reducing the number of microorganisms and better grades of sensory properties held temperature and 4°C except that a slightly higher total number of bacteria after weak sensory grades there in treated sausages with lactate kept at a temperature of 6°C .

The obtained results show a positive effect on lactate coupled with vacuuming sausages on the microbiological and sensory characteristics picture, and therefore an extension the durability of sausages. The addition of lactate production during the popular sausage is desired and desirable as a positive influence on the product that is continuing durability of the products in it without breaking the sensory properties of the sausages.

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