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Влияние на екстракт от чесън върху микробиологичня статус и сенсорните свойства на свинско мляно месо

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Effects of garlic extract on the microbiological status and sensory properties of pork minced meat

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Abstract

The paper presented the results of the impact of garlic extract on the microbiological status and sensory properties of pork minced meat. For this purpose were prepared four sets of ground meat from that first group without addition of the garlic extract (control group), second group with addition of 0.1g / kg. extract third group with addition of 0.2g / kg. extract and the fourth group with the addition of 0.3g / kg / ekstrakt.From each group were harvested randomly comes in nine samples and they were studied. In none of the tested samples was determined the presence of Proteus, clostridia, E. coli Salmonella, Listeria moncitogenes. They were determined only the total number of bacteria which were mostly bacilli.The greatest total number of bacteria were in the sample group of one group (control group). and lowest in samples from group 3. group best marks in respect of all three properties reviewed enzorni received samples from a group of 3.Exstract applied at a concentration of 0.3g / kg affect the microbiological status and does not affect the sensory characteristics of the minced meat.

Keywords: *Minced meat, microbiological status, sensory properties*

Introduction

Minced meat and other meat products belongs to the high risk meat products and is susceptible to spoilage. The sustainability of minced meat have a big impact of surface contamination and the oscillation of the temperature of storage. In such cases a decrease and deterioration of the quality of the minced meat, which occur chemical and microbial changes of the same. As a result of the growth and reproduction of microorganisms in minced meat a change of smell and taste appears. The intensity of change in these sensory qualities is connected with creation of undesirable volatile metabolites in minced meat. According to Jay et.al 2003 the number of

microorganisms greater than 7 log.CFU / g is responsible for the occurrence of odor, milky tint while decaying smell occurs with decomposition of free amino acids when the growth of microorganisms reach a value of 9 log.CFU / g. The most common causes of spoilage of the minced meat is bacteria *Pseudomonas Species, Bronchotrich Thermosphacta*, bacteria from the species *Seratia, Enterobacter, Proteus*, lactic acid bacteria etc . (labadie 1999;Ellis I Godachre 2000). Lately to preserve the durability and extension the term of minced meat are used vacuum packaging in modified atmosphere, application potassium and sodium lactate and its vacuum in MAP (Church et. al. 995; Rahman et.al. 1998). In the past few years, several studies are performed on the impact of extracts of spicy plants on the microbiological status of fresh meat, minced meat and meat products. In this study the garlic extract added in minced meat contains biologically active compounds with anti-microbial effect. The main bioactive components are sulfur compounds allin, diallyl sulfide, allyl sulfide and di allicin (Savic and Danon 1985; Kumar and Bervval 1998 ; Ankri and Milerman 1999; Dragoev 2004). In the literature there is very little data about the impact of extracts of garlic on the microbiological status of minced meat, so the aim of our research was to investigate the influence of different concentrations of garlic extract on the microbiological status and sensory properties of pork minced meat.

Material and method of work

As material for examination we have used the pork minced meat according to the rulebook for quality of minced meat, meat preparations and meat products (no.63 from 2013 in the Republic of Macedonia). After slaughter, primary processing, cooling of pork halves and removing the bones was made categorization of meat. After grinding, four group of minced meat were prepared:

Control group I control with no added garlic extract

group II – with 0.1 g/kg garlic extract

group III -with 0.2 g/kg garlic extract

group IV - with 0.3 g/kg garlic extract

The garlic extract was added after grinding the meat. The extract is 100% bacterial pure product from company Ecom Food Industry coporation Ontario Canada. After adding the extract minced meat was packaged in plastic containers with dimensions 240mm X 130 mm and depth 50mm. After filling, all samples were vacuumed with multifunctional vacuum machine MULTIVAC (German production). After vacuum packaging, groups were stored in a chamber at a temperature of +4^{o}C.

During storage the first, third and fifth day of production at random were taken five samples was examined microbiological status of the same. Sensory examination of the samples is done on the fifth day of production.

Microbiological analysis

For bacteriological examination, material was taken from each sample – 20 g of material, which before planting is homogenized with 180 ml steriled is tilled water from which is made other dilu-tions. The number of bacteria is in log/CFU/g. Microbiological tests were performed as examining the presence of Proteus, Clostridia, E. coli, Salmonella, Listeria monocytogenes and total number of bacteria. Proteus (brilliant green 37°C/ 24–48 h), E. coli (brilliant green bile lactose broth 42°C/24–48 h), Clostridia (blood agar 37o C/48 h), Salmonella (bismuth sulphite agar 37o C/24–48 h), Listeria monocitogenes (Fraser broth base Palcam agar, Oxoid) ISO 11290/2010, total number of bacteria (nutrient agar 37°C/24–48h) ISO 4833/ 2008.

Sensory examination

The evaluation was performed by a 8 experienced specialists following sensory attributes: external appearance, color, smell and appearance of drain.Sensory analysis was obtained with using 9 step scale for testing of sensory properties of meat and meat products established by VNIMP Moscow.

Statistical processing

The obtained results were statistically processed using the computer program Microsoft Exel 97/2003.

Results and Discussion

In samples of ground meat during the test period not determined presence of *Proteus,Clostridia, E. Coli, Salmonella, Listeria monocitogenes*. They were determined only the total number of bacteria that are mostly bacilli. The results of the microbiological status of the tested samples of minced pork are given in Table 1.

Tab 1.

Microbiological status of the tested samples of minced pork packaged in vacuum and kept at 4 ° C

Days	Control Group I	Group II	Group III	Group IV
1	3.53 log.cfu / g.	3.51 log.cfu / g.	3,41 log.cfu / g.	3,20 log.cfu / g.
3	3.50 log.cfu / g.	3.36 log.cfu / g.	3.30 log.cfu / g.	3.32 log.cfu / g.
5	3.39 log.cfu / g.	2.96 log.cfu/g	3.30 log.cfu / g.	3.17 log.cfu / g.

legend
group I- control group no added garlic extract
group II - with the addition of 0.1g / kg extracts
grupa III - with the addition of 0,2g / kg. extract
group IV - with the addition of 0.3 g / kg. Extract

The table shows that during vacuum storage of minced meat, the highest total number of bacteria was found in control samples not containing garlic extract and the smallest total number of bacteria was found in the sample III. In none of the examined samples during the test period the total number of bacteria didn't crossed the recommended limit of acceptability 7 log.cfu/g. During the test period the total number of bacteria do not cross the value of 3,53 log.cfu / g. The results of the sensory properties of minced meat are given in Table 2.

Table 2 .

Sensory evaluation of tested samples vacuum-packed minced meat store below + 4 ° C

Sensory properties	Control Group I ±SE	Group II ±SE	Group III ±SE	Group IV ±SE
Colored surface	5±0,22	7±0.15	6±0,25	7±0.20
Color section	5±0.20	7±0.17	6±0.18	7±0.12
Smell	6±0.18	6±0.20	5±0.28	5±0.15

Best estimates with regard to all three studied sensory properties received sample III and weakest control sample. There are no statistically significant differences between the tested samples in all tested sensory properties.

Conclusion

We can conclude that despite the piercing smell that has garlic extract applied in vacuum-packed minced meat with concentration of 0.3g / kg affects the bacteriological status of the same, while no effect on the sensory characteristics of the minced meat.

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