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THE EFFECT OF GARLIC ON THE QUALITY TRAITS OF BROILER CARCASS

Petričević V.¹, Lukić M.¹, Škrbić Z.¹, Petričević M.¹, Dosković V.²,
Rakonjac S.², Cekić B.¹

Abstract: The aim of the study was to study the effect of the addition of different concentrations of garlic to feed for broiler chickens on the quality of the carcass. The trial was carried out on 800 chickens divided into 4 groups with 4 repetitions per group. Chickens were fed *ad libitum* and the composition of the feed mixture differed only in the amount of added garlic powder. In the control group (K) no garlic was added. Chickens in the first (I) group consumed feed with the addition of 0.2% garlic powder, in the second group (II) 0.4% was added while 0.6% of garlic was added in the third group (III). At the end of the experiment, at the age of 42 days, the randomly selected 12 chickens (6 males and 6 females) from each group were sacrificed in order to determine the carcass quality traits. The results showed, that increasing the ratio of garlic significantly ($p < 0.01$) decreased the abdominal fat content.

Keywords: broiler chickens, nutrition, garlic, carcass quality

Introduction

Garlic has an important role in the human diet, used as a spice and is also known as a medicinal plant. Traditionally, it is used for antibacterial, antiviral and antioxidant properties (Konjufca et al., 1997). Because of these properties, it is considered a natural growth promoter and can replace artificial growth promoters such as antibiotics. Thanks to its useful properties, garlic is increasingly used in poultry nutrition. The use of garlic in nutrition of broilers has a stimulating effect on the immune system (Demir et al., 2003), it contains allicin, which is an active ingredient that provides a distinctive smell and aroma (Rahmatnejad and Roshanfekar, 2009). Examination of the beneficial effects of garlic in nutrition of broiler chickens is primarily aimed at determining production results (Oladele et al., 2012; Karangiya et al., 2016). Improvement of production performance as a result of

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the use of garlic was most often achieved when the participation of this additive did not exceed 1%. Puvača et al. (2015) confirmed positive effects on production results due to the use of garlic at a concentration of 0.5% in the mixture. In some studies, increasing the share of garlic over 1% caused negative effects on the studied parameters (Raesi et al., 2010).

The aim of this study was to examine the effect of the addition of different levels of garlic in the nutrition of broiler chickens on the carcass quality.

Material and Methods

The experiment was carried out with 800 one-day broiler chickens of the Ross 308 hybrid. Chickens were divided into 4 groups and placed in 16 boxes, 50 chickens in each box, so there were 4 repetitions per treatment. During the research broilers were fed with three diets, starter (23% CP), grower (21% CP) and finisher (19% CP). The feed was provided ad libitum. The composition of experimental diets differed only in the amount of added garlic powder. In the control group (K) no garlic was added. Chickens in the first (I) group consumed mixtures with 0.2% garlic powder added, in the second group (II) 0.4% was added, while 0.6% garlic was added in the third group (III). After final stage of fattening, at the age of 42 days, by using the method of completely random selection, 6 male and 6 female chickens were measured and slaughtered after 12 hours of starvation. After slaughtering the carcasses were cooled to 4 ° C for 24 hours, and then processed in accordance with *Regulation on the quality of meat of feathered livestock* (1981). In this way the following carcasses parameters were:

- "Conventional processing" - carcasses with head, neck, legs and edible internal organs (heart, lung, liver, stomach, kidneys and spleen);
- "Ready to roast" - carcasses without head and legs, but with neck and edible intestines;
- "Ready to grill" - carcasses without head, legs, neck and edible intestines.

Abdominal fat was removed in the treatment of the carcasses. The obtained weight of the carcasses and abdominal fat were put in relation to the live weight of the chickens. In this way, the values for slaughter yield and the share of abdominal fat in the carcass were obtained.

Cutting of chicken carcasses to the basic parts was done in order to determine their share in the carcass. In this way, the share of the breast, drumstick, thigh and wings were calculated.

For the statistical analysis, the software package STATISTICA, version 12 (StatSoftInc.) was used. The degree of statistical significance of differences between groups was determined by the LSD test.

Results and Discussion

The effects of using different concentrations of garlic in feed mixtures for broiler chickens on pre-slaughter weight, slaughter yield, and share of valuable carcass parts and abdominal fat are shown in Table 1.

Table 1. Slaughter traits of broiler chickens

	Treatments				SEM	p
	C (0%)	I (0.2%)	II (0.4%)	III (0.6%)		
Body weight, g	1976.7	1995.1	2050.9	2057.5	29.448	ns
Conventional processing, %	81.82	81.90	82.19	82.25	0.197	ns
Ready to roast, %	75.47	75.75	76.16	76.13	0.201	ns
Ready to grill, %	67.80	68.12	68.16	68.41	0.196	ns
Abdominal fat, %	0.89 ^a	0.70 ^{ab}	0.64 ^{ab}	0.51 ^b	0.036	<0.01
Breasts, %	19.65	20.47	20.29	20.04	0.175	ns
Thigh, %	10.26	10.28	10.40	10.57	0.087	ns
Drumsticks, %	11.55	11.89	11.69	11.88	0.069	ns
Wings, %	7.89	7.84	8.13	7.84	0.062	ns

^{a-b} In a row, the least squares means with a different superscript differ significantly ($p < 0.01$); SEM, standard error of mean; ns, not significant

Pre-slaughtered weight of broilers did not differ statistically significantly ($p > 0.05$) between the studied treatments. Similarly, the slaughter yields „Conventional processing“, „Ready to roast“ and „Ready to grill“, were not statistically significantly influenced by the examined factor. The share of abdominal fat was statistically significantly lower ($p < 0.01$) in chickens fed with the addition of 0.6% garlic powder compared to the control group. An analysis of the effect of garlic on the share of valuable carcass parts showed that there were no significant differences in the share of breasts, drumsticks, thighs and wings.

The obtained results indicate the importance of garlic use, which is reflected in the reduction of abdominal fat in the carcass. Similarly to our results Milošević et al. (2013), in their examination of the effect of different concentrations of garlic in broiler nutrition on quality of carcass quality traits, have found statistically significantly lower abdominal weight in groups with the addition of garlic compared to the control group. The authors state that there are no significant differences in the slaughter yield „Ready to roast“ and share of valuable carcass parts. Also, Stanačev et al. (2011) conclude that the use of garlic results in substantially better production performance, but that there are no significant differences in the carcass quality traits. Contrary to our results, Raeesi et al (2010) have found significant differences in the values for share of breast and slaughter yield „Ready to grill“ between broilers fed with the addition of 1% garlic and control group.

Conclusion

On the basis of the results of the study of the effect of garlic supplement on the quality of broiler carcass, the following can be concluded: the use of garlic in mixtures at a concentration of 0.6% caused statistically significant ($p < 0.01$) reduction of the share of

abdominal fat relative to the control group. The negative effects of the use of garlic on the slaughter yields and the share of valuable carcass parts have not been determined.

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References

1. Demir E., Sarica S., Ozcan M.A. and Suicmez M. 2003. The use of natural feed additives as alternatives for an antibiotic growth promoter in broiler diets. *Br. J. Poultry Science* 44, 44-45.
2. Karangiya VK., Savsani HH., Shrikant SP., Garg DD., Murthy KS., Ribadiya NK. and Vekariya SJ. 2016. Effect of dietary supplementation of garlic, ginger and their combination on feed intake, growth performance and economics in commercial broilers. *Veterinary World* 245-250.
3. Konjufca VH., Pasti GM. and Bakalli RI. 1997. Modulation of cholesterol levels in broiler meat by dietary garlic and chopper. *Poultry Science* 76, 1264-1271.
4. Milošević, N., Stanaćev V., Perić L., Đukić Stojčić M. and Veljić M. 2013. Effects of different levels of garlic powder in the diet on production parameters and slaughter traits of broiler chickens. *European Poultry Science* 77, 254-259.
5. Oladele OA., Emikpe BO. and Bakare, H. 2012. Effects of dietary garlic (*Allium sativum* Linn.) supplementation on body weight and gut morphometry of commercial broilers. *International Journal Morphol.* 30, 238-240.
6. Regulation on the quality of meat of feathered livestock 1981. *Official Gazette SFRJ* 1, 27-30.
7. Puvača N., Kostadinović Lj., Ljubojević D., Lukač D., Lević J., Popović S., Novakov N., Vidović B. and Đuragić O. 2015. Effect of garlic, black pepper and hot red pepper on productive performances and blood lipid profile of broiler chickens. *European Poultry Science* 79, 1-13.
8. Raesi M., Hoseini-Alibad SA., Roofchae AA., Shahneh Z. and Pirali S. 2010. Effect of periodically use of garlic (*Allium sativum*) powder on performance and carcass characteristics in broiler chickens. *World Academy of Science, Engineering and Technology* 68, 1213-1219.
9. Rahmatnejad E. and Roshanfekar H. 2009. Evaluation the effect of several non-antibiotic additives on growth performance of broiler chickens. *Journal of Animal and Veterinary Advances* 8, 1757-1760.
10. Stanaćev V., Glamočić D., Milošević N., Puvača N., Stanaćev V. and Plavša N. 2011. Effect of garlic (*Allium sativum* L.) in fattening chicks nutrition. *African Journal of Agricultural Research* 6, 943-948.