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Examination of the carcass in terms of quality and sanitation in broiler chickens fed with marine hydrobionts

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ABSTRACT

The objective of this study was to examine the quality and sanitary characteristics after post slaughter period of the carcasses of chickens which fed with marine hydrobiont. A total of 240, 12 day-old broiler chickens from Ross 308 breed were used in the study. The chickens were divided into three groups as two experimental groups and a control group. The chickens in the control group were fed with basal diet (BD) during the experiment. In the first experimental group, 7% of the basal diet was replaced with mineral additive (MA) while in the 2nd group 7% percent protein mineral additive was added to the feed of chickens. The chicks were fed with these feeds from 21 to 42 days of age. During the study the broilers were constantly observed considering the disposal of feed consumption and their general conditions. The chickens were slaughtered at the end of the study and following slaughtering process morphologic and sanitary assessment of carcasses was carried out. In addition, external appearance, visceral organs and carcass samples of slaughtered chickens were checked during the veterinary inspection. The microbiological investigation were performed by using *Colpoda steinii* infusorium. There was no abnormal changes in organs or appearance of tissues among control and experimental groups according to the post slaughter veterinary inspection. In addition, visually examination revealed that carcasses were identical for the control group and the experimental groups. There was no difference between the control and experimental group according to microbial contamination results. As a conclusion, it is evaluated that the meat of broiler chicken in the experimental groups are safe for consuming. Therefore, it was concluded that the prepared hydrobionts could be used safely in the poultry feeding.

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Introduction

In modern conditions animal production especially, meat is one of the main sectors in agricultural of Ukraine. Accordingly, researches for new feed sources which will contribute to covering traditional raw material shortage and increasing of animal production is getting more important. In European and many other countries of the world the problem of ration enrichment in animal husbandry is solved by using marine hydrobionts as a cheap source of raw protein, vitamins, mineral and bioactive substances.

There were numerous researches conducted by Odessa veterinary and sanitary school scientists to design modern technologies allowing to utilize marine hydrobionts especially mussels (Dankevych and Rozum 2018).

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They were also investigated the effect and efficiency of those feed stuff on farm animals and poultry production (Kovbasenko and Danylova,1981; Dankevych, 2018a).

This article represents the study results (veterinary and sanitary) on using feed stuff containing marine hydrobionts (Dankevych, 2018b), protein-mineral and mineral additives in poultry meat production produced by from the waste of processed marine hydrobionts. The technology of their production was approved by two useful model patents of Ukraine No34634 MPK (2008) A23 K 1\10, A 23 K 1\175 "Method of food additives production from marine hydrobionts for the poultry." No 4200808275; No 42687 MPK (2009) A 23 K1\10, A 23 K 1\175 "Method of food additives production from marine hydrobionts for the poultry" No 4200908402 (Kovbasenko and Dronova, 2008; Kovbasenko and Karaivan, 2009).

In the course of the study the veterinary and sanitary assessment, the analysis of feed additives as well as the post slaughter veterinary and sanitary expertise of carcasses were held.

The aim of this study is to examine the quality and sanitary characteristics of chicken carcasses, fed with marine hydrobiont after post slaughter period.

Materials and methods

The experiment was conducted in a broiler-growing company. Veterinary and sanitary examinations were conducted department of Odessa State Agrarian University.

Chickens and diet: Totally 12 day old 240 Ross 308 broiler chicken were used in the study. The chickens were divided into three groups as a control and 2 experimental groups each consist of 80 chicken (forty of them were fed with a diet consist of mineral additive and the other forty fed diet consist of protein-mineral-additive). The chickens in the control group were fed with basal diet (BD) during the experiment. In the 1th experimental group (group 1), 7% of the basal diet was replaced with mineral additive or protein mineral additive, while %7 percent mineral or protein-mineral additive was added to the feed of chickens in the 2nd group. The chicks were fed with these feeds from 21 to 42 days old age. Feed consumption and general conditions of broilers were continuously checked during the study.

Experimental procedures: At the end of the study, the chickens were slaughtered (10 chicken were selected from each groups), morphologic and sanitary assessment of carcasses was carried out. In the veterinary inspection, external appearance of chicken, visceral organs and carcass samples were checked. To determine whether the feeds given to chickens had an any harmful effect, *Colpoda steinii* infusoria was used (SVMM Gudlines, 2002). The method for identifying general toxicity of animal products designed by the veterinary and sanitary examination department of Odessa State Agrarian University and approved by the State Veterinary Medicine Department in 2000 (SDV. (2003).

Preparation of Colpada steinii culture: In the first step, a matrass with dry colpoda culture and another one with growing medium were opened. Then the matrass with colpoda is mixed with 4 ml of growing medium, closed with a cotton plug and placed into a thermostat at 26-28C° for 16-24 hours. At the same time, 2ml infusoria culture transferred into 2 clean matrasses. (one of them for the test, the other one for the control).

Preparation of aqueous extract: 20g animal materials (taken from chicken meat) were transferred into a matrass and added 250 ml of distilled water. The matrass was shaken at the speed of 120 rpm for 20 minutes, afterwards the aqueous dispersion filtered using filter paper. Thus, the aqueous extract was obtained. 2 ml of this extract added to the matrass which consist of active colpoda infusoria. In addition, 2 ml of distillated water added to control matrass. Both matrasses were placed in an incubator (26-28°C) for 10 minutes. After the incubation, a drop of sample was investigated under the light microscopy. If the sample does not contain live infusoria the examination was stopped, but if lots of active infusoria were observed, the experiment was continued for 3 more hours. After 3 hours, if 80-90% of infusoria didn't die, the incubation was extended for more 16- 24 hours. At the end of the incubation period 1 drop of 5% iodine solution was added to the test and control samples to fix the infusoria. The quantity of infusoria was counted using Fuks-Rosenthal counting chamber. Toxicity was determined according to the following criteria: very toxic= death of 100% infusoria during 10 minutes, toxic = death of 100% infusoria during 3 hours; low toxic = death of less than 80-90% infusoria and 90% intensity of growth for 3 hours, non-toxic = if all infusoria are alive and the intensity of growth is same or higher than control sample.

Bacterial contamination of broilers' carcasses: Bacterial contamination was determined by washing the carcass samples obtained different part of the chickens. For this purpose, samples were taken from

the surface of the carcasses (back area), inside (abdominal cavity – serous membrane) of the body and into the femur muscles (from 0,5-1cm depth of tissue). After the samples taken coliform and salmonella species were counted according to "Compulsory minimal list of raw material, animal and plant products research." guide of the State Department of Veterinary Medicine. №87 from 18.11.2003).

Results and Discussion

According to the post slaughter veterinary and sanitary assessment of broilers' carcasses, no abnormal changes were found in the tissue or organs of control and experimental groups. Visually control group carcasses were identical with those of the study groups. According to organoleptic examination, it was found that all the carcasses were high quality and complied with the following criteria: Exterior. Dry, yellow color with a shade of pink, closed glossy beak, a little gibbous eye bulb, glossy walleye, yellow color basting and visceral fat, wet glossy serous membranes without slime, hardly wet muscles in section of pale pink color (do not leave wet traces on the paper). Consistency: Firm and elastic muscles, when pressed with a finger a small pit appears but becomes even very fast when released. Smell. Specific smell of fresh meat.

Since marine products such as mussels accumulate in heavy metals, these products can also accumulate in chicken meat when used as feed additives. therefore, it may also cause toxic effects for those consuming these meats. For this reason, samples taken from chicken carcasses were test using *Colpada steinii*. The results obtained from the *Colpada steinii* test showed that the marine hydrobionts used as feed additives in this study did not have any toxic effect on chicken's meat.

Because it is observed that infusoria has grown as in control samples in carcass samples taken from chickens. The results similar with our previous results (Dankevych, 2018c ; Dankevych, 2018d).

The results obtained from the bacterial contamination showed that there are no significant differences between control and two experimental groups. The bacterial content of the carcasses in experimental group and test groups was almost the same (Table 1). In addition, it was also observed that considering the bacterial contamination, addition of mineral or protein-mineral in chicken feeds did not change the situation.

Table 1: Bacterial contamination of the chicken carcasses

Area of the taken sampling	Total cont. (CFU per 100 ml)	E. coli (CFU per 100ml)	Salmonella (CFU per 100 ml)
	Chicken fed with protein-mineral additive diet		
Surface of carcass (Back area)			
Control	110.4 ± 4,50	1.8 ± 0.21	36.7 ± 1.27
Group 1	112.1 ± 5,42	2.4 ± 1.26	40.1 ± 2.18
Group 2	100.6 ± 3,42	2.9 ± 0.12	38.8 ± 1.19
	NS	NS	NS
Inside of carcass (A. Cavity-Serous membrane)			
Control	48.6 ± 2.64	1.2 ± 0.18	19.4 ± 0.48
Group 1	51.2 ± 3.24	2.9 ± 0.18	20.4 ± 3.24
Group 2	50.2 ± 2.17	2.9 ± 0.17	27.6 ± 2.04
	NS	NS	NS
Muscles (Femur Muscles)			
Control	-	-	-
Group 1	-	-	-
Group 2	-	-	-
	Chicken fed with mineral additive diet		
Surface of carcass (Back area)			
Control	124.5 ± 6.12	2.1 ± 0.72	41.2 ± 3.41
Group 1	118.6 ± 2.08	1.8 ± 0.36	39.6 ± 2.12
Group 2	120.2 ± 5.41	2.4 ± 0.37	20.0 ± 2.64
	NS	NS	NS
Inside of carcass (A. Cavity-Serous membrane)			
Control	52.2 ± 5.04	2.6 ± 1.21	23.2 ± 6.81
Group 1	49.2 ± 1.18	2.0 ± 0.42	21.7 ± 1.24
Group 2	50.1 ± 4.46	2.1 ± 0.62	22.4 ± 1.18
	NS	NS	NS
Muscles (Femur Muscles)			
Control	-	-	-
Group 1	-	-	-
Group 2	-	-	-

Total cont. = total contamination, CFU = colony forming unit, A. cavity = abdominal cavity, NS = non-significant. Group 1 = chicken fed basal diet, Group 1 = chicken fed 7% feed additive (7% of basal diet replaced with mineral or protein-mineral additive), Group 2 = chicken fed %7 feed additive (extra % 7 percent mineral or protein-mineral additive was added to the diet).

Conclusion

The results obtained from this study showed that the marine hydrobionts used in poultry feeds do not adversely affect the microbiological contamination and quality of the carcass. Therefore, it was thought that mineral additive or protein-mineral additives obtained from marine hydrobionts could be used safely in chicken feeds.

References

Dankevych, N. I. (2018a). Sanitary evaluation of waste from the processing of sea hydrobinotes used for the production of fees. *Scientific reports of NULES of Ukraine,4*(74). (2018.04.018). Retrieved from htpp: // dx.doi.org/10.31548/dopovidi 2018.04.018. [in Ukrainian].

Dankevych, N. (2018b). Non-waste hydrobionts management. *Journal of Istanbul veterinary Sciences, 2*(2), 61-65.

Dankevych, N. I. (2018c). The technology for producing marine hydrobiont feed additives for the poultry, their fodder value and sanitary evaluation. *Veterinary biotechnology*, *33*(2),16-24 (in Ukrainian).

Dankevych, N. I. (2018d). The impact of sea hydrobionts additives on boiler ducks. *Bulletin of Poltava state agrarian Academy*, *3*(90). [in Ukrainian].

Dankevych, N. I. & E. Y. Rozum (2018). The impact of hydrobionts additives on ducks. Agrarian Bulletin of the Black Sea Region. *Agricultural and biological sciences*,91. 75. [in Ukrainian].

Kovbasenko, V. M., & Danylov, A. A. (1981). Guidelines for processing mussels into feed additives. Guidelines. Odessa: OAI [in Ukrainian].

Kovbasenko, V. M., & Dronova, N.I. (2008). Method of producing feed supplement for poultry from marine hydrobionts. Patent of Ukraine for useful model. A23K 1/175. № 34634; declared 19.06.2008; published 11.08.2008, № 15. [in Ukrainian].

Kovbasenko, V. M., & Karaivan, N.I. (2009). Method of producing feed supplement for poultry from marine hydrobionts. Patent of Ukraine for useful model. A23K 1/10, A23K 1/175. № 42687; declared 09.04.2009; published 10.07.2009, № 13. [in Ukrainian].

Kovbasenko, V. M., & Karaivan, N. I. (2009). Method of producing feed supplement for poultry from marine hydrobionts. Patent of Ukraine for useful model. A23K 1/10, A23K 1/175. № 42687; declared 09.04.2009; published 10.07.2009, № 13. [in Ukrainian].

SDV. (2003). Mandatory minimum list of research materials, products of animal and vegetable origin, animal feed raw materials, feed, medicines and fortified al., Which should be in public veterinary laboratories. Order of the State Department of Veterinary Medicine №87 from 18.11.2003. www.document.ua.Retrievedfrom:http:// document.ua/obovjakovii-minimalnii-perelik-doslidzhensirovini-produkciy-nor8259.html[in Ukrainian].

SVMM Gudlines (2002). Method of application of culture of *Colpoda steinii* (kolpoda) dry for toxicological researches of meat and meat products from animals and poultry. Guidelines from 11.03.2002. State Department of Veterinary Medicine Ministry of Ukraine Policy. [in Ukrainian].