



## Improving the Carcass Characteristics of Boiler Chickens Fed on Diets Containing the mixture Toxbond Forte

Abeer Sweed Jasim<sup>1</sup> [abeer.sweed.jasim@gmail.com](mailto:abeer.sweed.jasim@gmail.com) Mohammed Sabah Bahauddin<sup>2</sup> [mo\\_ha\\_mm\\_ed\\_sa@uokirkuk.edu.iq](mailto:mo_ha_mm_ed_sa@uokirkuk.edu.iq) Nidhal Abdulghani Mustafa<sup>3</sup> [nidhal.mustafa@su.edu.krd](mailto:nidhal.mustafa@su.edu.krd)

<sup>1</sup> Directorate of Kirkuk Agriculture, Kirkuk, IRAQ.

<sup>2</sup> Department of Animal production, College of Agriculture, University of Kirkuk, Kirkuk, IRAQ.

<sup>3</sup> Department of Animal Resources, College of Agricultural Engineering Sciences, University of Salah-Aldeen, Erbil, IRAQ.

- Date of research received 25/06/2023 and accepted 25/07/2023
- Part of M.Sc. Dissertation for the first author.

### Abstract

The study is conducted in Kosar's company experimental fields / Erbil to study the improvement of the carcass characteristics of broiler chickens, specifically those feeding on diets including "Toxbond Forte". The experiment lasted for 35 days and used 120 unsexed one day old chicks from Rose 308 type with an average of  $42 \pm 3$  g per chick. The chicks were randomly classified into five treatments with three replications; each treatment had eight birds / replicate). The first treatment (T1) is called the control treatment in which the feed was without any addition, the second treatment (T2) included the addition of the compound with an average of 0.5 g / kg of feed, the third treatment (T3) included the addition of the mixture with a percentage higher than the second one, i.e. with a rate of 1 g / kg of feed, the fourth treatment (T4) included the rate of 1.5 g / kg of feed, and last treatment (T5) had the percentage of 2 g / kg of feed addition to the mixture. Results have shown that there are no big differences ( $p \leq 0.05$ ) in the relative weight of the main segments (chest and thigh piece), while the relative weight of the drumstick is significantly higher than the other treatments. Moreover, no differences have been seen for the secondary cuts, internal viscera and empty carcass weight, ( $p \leq 0.05$ ). Finally, the study has noted a significant difference ( $p \leq 0.05$ ) in the percentage of the net weight.

**Key words:** Broiler, Toxbond Forte, Carcass.

**Citation:** Jassim, A., BahaAldeen, M., & Mustafa, N. (2023). Improving the Carcass Characteristics of Boiler Chickens Fed on Diets Containing the mixture Toxbond Forte". *Kirkuk University Journal For Agricultural Sciences*, 14 (3), 82-87. doi: 10.58928/ku23.14309

**Correspondence Author:** Abeer Sweed Jasim- [jasim@gmail.com](mailto:jasim@gmail.com)

**Copyright:** This is an open access article distributed under the terms of the creative common's attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

## **Introduction**

Poultry meat is an important source of human nutrition because it contains high value of nutritional proteins. Besides, it is rich with amino acids, unsaturated fatty acids, mineral elements, and some vitamins such as group B vitamins (the most important group). In terms of health, it is also one of the most desirable types of meat for most consumers on a global scale [1] [2]. Bentonite is considered one of the most important clay minerals as an adsorbent, as it consists of a group of smectite [3] [4]. These clay minerals have been widely incorporated into poultry food to treat poisoning. Many researchers have recommend using these minerals as an ingredient in poultry feed. [5] [6] . The inclusion of yeast to chicken feed has led to an improvement in feed conversion efficiency and live body weight. Yeast has been used in poultry feed on a large scale as growth stimuli if its addition leads to an improvement in body weight and weight gain. The amount of improvement varies depending on Addition rates, nutritional status and other environmental factors [7]. The aim of the research is to improve the qualitative characteristics by adding the mixture compound (Toxbond Forte).

## **Materials and methods**

The current study was carried out to investigate the improvement of carcass characteristics of broiler feeding on diets included the mixture "Toxbond Forte". A closed hall with 15 cages with (1 x 1m) dimensions. The floor was covered by sawdust with 5 cm with addition of chicken paper. The chicks were distributed randomly to five treatments with three replicates. 8 birds for each replicate, and the replicates were also classified randomly from the 7th day of the experiment. The chicks were fed during the first ten days on the initial diet, which included 23% protein and 3000 kilocalories / kg of

energy, while the growth fed was used for the period 11 to 24 days. The growth fed contained 21% protein and 3100 kilocalories / kg. Lastly, the final fed was from 25 to 35 days and it contained 20% protein and 3175 kilocalories / kg of energy. The chicks were left in the first week to live at a temperature of 33 °C and freely feed was used. The feed was mixed with the mixture called Toxbond Forte (Equipped from Kosar Company) on the seventh day while the temperature was gradually decreasing according to the program of the company until it reached 22-23 C, and also with regard to the relative humidity within the required limits according to the directions of the production guide of the company.

The birds were divided into five treatments with three replicators; each replicate had 8 birds as follows:

T1: The control treatment: no addition.

T2: The second treatment: adding the mixture (Toxbond Forte) with a percentage of 0.5 g to each kg of feed.

T3: The third treatment: adding Toxbond Forte with a rate of 1 g to each kg of feed.

T4: The fourth treatment: adding Toxbond Forte at a rate of 1.5 g to each kg of feed.

T5: The fifth treatment: adding the Toxbond Forte with a percentage of 2 g to each kg of diet.

## **Results**

Statistical analysis in Table (1) indicates significant differences ( $p \leq 0.05$ ) in the carcass weight where T5 is superior than other treatments. In addition to that, the drumstick relative weight in T2 has the same when comparing with T4. In contrast to that, the relative weight of the major parts (breast and thigh) showed no differences. In fact, the differences were only arithmetic.

Table (1) indicates the impact of adding the mixture (Toxbond Forte) to the empty weight of the carcass (g) and the relative weight of the main cuts % (breast, thigh piece, drumstick) of 308 ROSS broilers (mean ± standard error).

Treatments	characteristics			
	Empty carcass weight(gm)	Breast%	Thigh piece%	Drumstick%
T1	1476.7±27.06 e	38.13±0.20 a	13.67±0.53 a	11.89±0.02 ab
T2	1583.3±26.17 d	37.56±1.23 a	14.71±0.75 a	12.08±0.22 a
T3	1648.7±31.10 c	38.89±1.12 a	14.48 ±0.99 a	11.39±0.20 ab
T4	1816.0±46.15 b	38.44±2.59 a	14.31 ±0.67 a	11.06±0.45 b
T5	1848.7±26.65 a	36.47±0.20 a	14.67±0.91 a	11.95±0.23 ab

\*The non-identical letters in the same column show that there are huge differences ( $P > 0.05$ ) among the treatments.

\*\*T1: control treatment (standard diet without additives), T2: adding the mixture with a concentration of 0.5 g/kg of diet, T3: mixing the mixture with a concentration of 1 g/kg of diet, T4: adding the mixture compound with a percentage of 1.5 g for each kg of feed, T5 Adding the mixture with a concentration of 2 g / kg of diet.

Table 2 shows significant differences in the live body weight specifically in T5. The table also shows no differences in the relative weight of the secondary cuts (neck, back), but the

differences were only arithmetic. In contrast, it a significant superiority ( $p \leq 0.05$ ) is noticed in the wings weight in T2 comparing with T3 and T5.

Table 2 shows the impact of adding Toxbond Forte on the live body weight at slaughter (gm) and the relative weight of the by-products % (wings, neck, back) of 308 ROSS broilers (mean ± standard error)

Treatments	Characteristics			
	Live body weight at slaughter(gm)	Wings%	Neck%	Back%
T1	2206.7±57.75 c	10.41±0.26 ab	4.88±0.13 a	20.67±0.98 a
T2	2140.0±30.00 e	11.15±0.50 a	3.88±0.75 a	20.16±1.09 a
T3	2173.3±31.66 d	9.73±0.37 b	3.94 ±0.43 a	21.39±0.69 a
T4	2426.7±53.41 b	10.13±0.16 ab	3.63 ±0.71 a	22.15±1.25 a
T5	2500.0±33.29 a	9.95±0.30 b	4.43±0.29 a	22.79±0.97 a

\*The non-identical letters in the same column note huge differences exist ( $P > 0.05$ ) among the treatments.

\*\*T1: control treatment (standard diet without additives), T2: adding the mixture compound with a concentration of 0.5 g/kg of diet, T3: mixing the mixture with a concentration of 1 g/kg of diet, T4: mixing Toxbond Forte with a a rate of 1.5 g to each kg of diet, T5 Adding the mixture at a concentration of 2 g / kg of diet.

Table 3 shows a significant superiority ( $p \leq 0.05$ ) in the percentage of purification in T4 comparing with the other treatments. No significant differences were noted in the relative weight of the internal organs (liver,

heart), and the differences were only arithmetic. While a significant ( $p \leq 0.05$ ) superiority was observed in the relative weight of the gizzard in T4

Table (3) mentions the impact of adding Toxbond Forte mixture on the percentage of grafts and the relative weight of the internal organs (liver, gizzard, heart) of 308 ROSS broilers (mean  $\pm$  standard error).

Treatments	Characteristics			
	Dressing percent %	Liver%	Gizzard%	Heart%
T1	67.63 $\pm$ 4.60 c	2.28 $\pm$ 0.26 a	1.02 $\pm$ 0.13 b	0.43 $\pm$ 0.06 a
T2	74.80 $\pm$ 8.17 b	2.12 $\pm$ 0.30 a	1.25 $\pm$ 0.10 ab	0.49 $\pm$ 0.06 a
T3	76.33 $\pm$ 7.15 ab	2.57 $\pm$ 0.41 a	1.15 $\pm$ 0.16 ab	0.40 $\pm$ 0.08 a
T4	77.00 $\pm$ 13.56 a	2.65 $\pm$ 0.20 a	1.54 $\pm$ 0.18 a	0.57 $\pm$ 0.17 a
T5	74.20 $\pm$ 4.65 b	2.55 $\pm$ 0.15 a	1.14 $\pm$ 0.07 ab	0.50 $\pm$ 0.03 a

\*The non-identical letters in the same column clarifies that there are worthy differences ( $P > 0.05$ ) among the treatments.

\*\*T1: Control Treatment (standard ration without additives), T2: adding the mixture compound at a concentration of 0.5 g/kg of feed, T3: adding the mixture compound at a concentration of 1 g/kg of feed, T4: adding the mixture compound at a concentration of 1.5 g/kg of feed, T5 Adding the mixture with a percentage of 2 g to each kg of feed.

## Discussion

The reason behind the improvement of the qualitative characteristics in this study is that the empty carcass weight showed significant differences in T5. These results do not agree with what was obtained [8], [9] stating that different types of mineral clays in the diet of broiler chickens do not affect the carcass weight. As well as the absence of significant differences in the relative weight of the thigh, this result was consistent with the result obtained by [8], which stated that there were no significant differences in the weight of the thigh of a bird when feeding on a diet containing mineral clay, but it contradicted the result of the researcher [9] that the mineral clay in the diet of broiler chickens led to an increase in thigh weight. As for the secondary segments, there was a significant superiority in the percentage of the wing. These results are consistent with the findings of the researcher [10]. As for the percentage of net weight, the increase in the percentage of net weight is due to the increase in the body weight and the rate of weight increase in the fourth week, specifically in the Fourth Treatment, the

superiority was clear perhaps it is due to the fact that bentonite is capable to increase its size 20 times when it is exposed to moisture, leading to increasing the surface area for absorption and thus increasing the utilization of ingested foodstuffs [11]. As for internal organs, it did not appear in the relative weight of the liver and heart, only a significant superiority appeared in the relative weight. For the gizzard, this study agrees with the results of the researcher [10].

## Conclusion

The addition of the mixture (Toxbond Forte) which is composed of bentonite and yeast to the diet of broilers led to significant ( $p \leq 0.05$ ) improvement in carcass characteristics of broiler chickens with a concentration of 1.5 g/kg.

## References

- [1] Kamboh, A. and Zhu, W.Y. (2013). Effect of increasing levels of bioflavonoids in broiler feed on plasma antioxidative potential, lipid metabolites and fatty acids composition of meat poult sci. 92:454-461 Microbiol Methods. 2013; 92:289-292. DOI: 10.1016/j.mimet.2012.12.010.
- [2] Jayasena, D.D., Jung, S., Kim, Boe, Ys., Yong, HI., Lee, JH., JG. And Jo,C. (2013). Comparison of quality traits of meat from korean native chickens

- and broilers used in two different traditional; olean cuisines. *Asian Austral as J Anim. sci.* 26:1038-1046.
- [3] Zhang, X., Yuan, X., Shi, H., Wu, L., Qian, H., and Xu, W. 2015. Exosomes in cancer: small particle, big player. *Journal of hematology and oncology.* 8.1: 83.
- [4] Mahmoud, M., Mohamed, A., Kamal, M. S., Sultan, A., & Hussein, I (2019). Upgrading Calcium Bentonite to Sodium Bentonite Using Seawater and Soda Ash. *Energy & Fuels*, 33(11), 10888-10894.
- [5] Fowler, J., Li, W., and Bailey, C (2015). Effects of a calcium bentonite clay in diets containing aflatoxin when measuring liver residues of aflatoxin B1 in starter broiler chicks. *Toxins.* 7.9: 3455-3464.
- [6] Yang, C. K., Cheng, Y. H., Tsai, W. T., Liao, R. W., Chang, C. S., Chien, W. C., and Yu, Y. H (2019). Prevalence of mycotoxins in feed and feed ingredients
- [7] Al-Shadidi, Scheherazade Muhammad Jaafar (2001). The effect of using percentages of locally isolated yeast culture and the treated feed with it on the productive performance of broiler chickens. Master Thesis - College of Agriculture / University of Baghdad.
- [8] Khanedar, F.; R.Vakili and S .Zakizadeh .(2012). Effects of Two Kinds of Bentonite on the Performance, Blood Biochemical Parameters, Carcass Characteristics and Tibia Ash of Broiler Chicks, *Global Veterinaria* 9 (6): 720-725
- [9] Safaeikatouli, M.; F. Boldaji; B. Dastar and S. Hassani.(2012). The Effect of Dietary Silicate Minerals Supplementation on Apparent Ileal Digestibility of Energy and Protein in Broiler Chickens, *international j. of agriculture &biology*, 11– 251/awb14–2–299–302
- [10] Ezzedine, Elham Nouredine. (2012). The effect of using mineral clay (Shurawah-1) on the weights of cuts and the weights of internal gizzards of broiler chickens fed on diets contaminated with aflatoxins, *College of Agriculture, Kirkuk University, Kirkuk University Journal of Agricultural Sciences* 4 (1).
- [11] Mousa, K. M.; O. M. El-Malky; O.F. Komonna and S. E. Rashwan (2012). Effect of some yeast and minerals on the productive and reproductive performance in ruminants. *Journal of American Science.* 8(2): 291-303.



## تحسين صفات الذبيحة لفروج اللحم المغذاة على العلائق الحاوية على المركب الخليط Toxbond Forte

نضال عبد الغني مصطفى<sup>3</sup>

محمد صباح بهاء الدين<sup>2</sup>

عبير سويد جاسم<sup>1</sup>

[nidhal.mustafa@su.edu.krd](mailto:nidhal.mustafa@su.edu.krd)

[mo\\_ha\\_mm\\_ed\\_sa@uokirkuk.edu.iq](mailto:mo_ha_mm_ed_sa@uokirkuk.edu.iq)

[abeer.sweed.jasim@gmail.com](mailto:abeer.sweed.jasim@gmail.com)

- <sup>1</sup> مديرية زراعة كركوك، كركوك، العراق
- <sup>2</sup> قسم الانتاج الحيواني، كلية الزراعة، جامعة كركوك، كركوك، العراق.
- <sup>3</sup> قسم الثروة الحيوانية، كلية علوم الهندسة الزراعية، جامعة صلاح الدين، اربيل، العراق.

- تاريخ استلام البحث 2023/06/25 وتاريخ قبول البحث 2023/07/25.
- البحث مستل من رسالة الماجستير للبحث الاول.

### المستخلص

أجريت هذه التجربة في الحقول التابعة لشركة كوسار - أربيل لدراسة تحسين الاداء الانتاجي وصفات الذبيحة لفروج اللحم المغذاة على العلائق الحاوية على المركب الخليط (Toxbond Forte) من 20/7/2022 ولغاية 25/8/2022 ولمدة 35 يوماً استخدمت في هذه التجربة 120 فرخاً من فروج اللحم غير مجنس من سلالة روز 308 بعمر يوم واحد وبوزن ابتدائي بمعدل  $3 \pm 42$  غم للفرخ الواحد أذ وزعت الافراخ عشوائياً الى 5 معاملات بواقع 3 مكررات لكل معاملة (8 طير/مكرر) وكانت المعاملات التجريبية كالآتي : المعاملة الاولى T1: معاملة السيطرة بدون أي إضافات، والمعاملة الثانية T2: إضافة المركب بنسبة 0.5 غم / كغم علف، والمعاملة الثالثة T3: إضافة المركب بنسبة 1 غم / كغم علف، والمعاملة الرابعة T4: إضافة المركب بنسبة 1.5 غم / كغم علف والمعاملة الخامسة T5: إضافة المركب بنسبة 2 غم / كغم علف، أظهرت نتائج التحليل الاحصائي عدم وجود فروقات معنوية ( $p \leq 0.05$ ) في الوزن النسبي للقطيعات الرئيسية (الصدر والقطعة الفخذية) أما الوزن النسبي لعصا الطبال فكانت متفوقة معنوياً على باقي المعاملات أما بالنسبة للقطيعات الثانوية والاحشاء الداخلية ووزن الذبيحة فارغ لم تظهر فروقات معنوية ( $p \leq 0.05$ )، وكذلك وجود فروقات معنوية ( $p \leq 0.05$ ) في نسبة التصافي.

الكلمات المفتاحية: فروج اللحم، المركب الخليط، صفات الذبيحة.