www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2020; 9(3): 668-671

www.thepharmajournal.com
Received: 12-01-2020
Accepted: 14-02-2020

Rewatkar HN
Department of Animal Nutrition, Post Graduate Institute of Veterinary & Animal Sciences, Akola, Maharashtra, India

Vipin
Divison of Animal Nutrition, ICAR-Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh, India

Kundan K
Divison of Animal Nutrition, ICAR-Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh, India

Pramod KS
Divison of Animal Nutrition, ICAR-Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh, India

Corresponding Author:
Kundan K
Divison of Animal Nutrition, ICAR-Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh, India

Assessment of supplementation of oregano oil and probiotic on carcass yields of broiler chicken

Rewatkar HN, Vipin, Kundan K and Pramod KS

DOI: https://doi.org/10.22271/tpi.2020.v9.i3l.4659

Abstract
To assess the effect of essential oils and probiotics on carcass yields of broiler, this study was carried out on day-old broiler chicks of Ven-Cobb 400Y strain (n=240) for forty-two days. These broiler chicks were randomly divided into four equal treatment groups with T_0 (Control), T_1, T_2 and T_3 with 60 birds in each group having 4 replicates of 15 birds in each group. The treatments were T_0 (Control, Standard broiler chicken diet as per BIS, 2007), T_1 (Standard broiler chicken diet as per BIS, 2007 + oregano essential oil @ 0.15 gm/kg diet), T_2 (Standard broiler chicken diet as per BIS, 2007 + probiotic (encapsulated *Saccharomyces cerevisiae*) @ 200 gm/ tonnes) and T_3 (Standard broiler chicken diet as per BIS, 2007 + oregano essential oil @ 0.15 gm/kg diet + probiotic (encapsulated *Saccharomyces cerevisiae*) @ 200 gm/ tonnes). Their dressing percentage was significant ($P<0.05$) and giblet, boneless breast, boneless leg and abdominal fat percentage showed non-significant ($P>0.05$) differences among all treatment groups. So the supplementation of probiotics and essential oils in broiler chicken diet improve the carcass yield by increasing the dressing percentage.

Keywords: Broiler, oregano essential oil, probiotics, carcass yield

1. Introduction
The poultry sector needs maximum performance from broilers as well as layer**.** Nowadays, essential oils (EOs) are used in poultry feed, as these have antimicrobial, antioxidant, antifungal, antiparasitic and antiviral properties. Besides this, other beneficial effects of EOs also include appetite stimulation, improvement of enzyme secretion related to food digestion and immune response activation. Many kinds of natural substances, prebiotics and probiotics have been supplemented to broilers to increase poultry production by activating intestinal function. (Awaad *et al*., 2014) [4]. The effect of a specific combination (SC) of carvacrol (active constitute of oregano essential oil), cinnamaldehyde on productive performance and immune response in broiler chickens. The probiotics are used in poultry for "competitive/ exclusion" of bacterial pathogens (Barrow P *et al*., 1992) [5]. Probiotics are living microorganisms which upon ingestion in adequate amounts confer health benefits to host (FAO/WHO 2002) [9]. Khattak *et al.* (2014) [13] evaluated the carcass weight, breast weight, and relative percentage of breast meat increased ($P < 0.05$) when diets were supplemented with Tecnaroma Herbal Mix PL compared with that from birds fed the control diet. Peng *et al.* (2016) [20] investigated the effects of diets containing oregano essential oil (OEO) supplementation exhibited a significantly positive effect on the growth performance, carcass traits and intestinal health of broilers, indicating that OEO may be a promising alternative to antibiotic growth promoters. Giannenas *et al.* (2016) [11] reported oregano essential oil alone or as a mixture with laurel essential oil can be used to improve growth performance with less fat meat. Manafi *et al.* (2016) [15] compared the effects of a new multispecies probiotic containing four Bacillus species and *Saccharomyces boulardii* with a commercial probiotic and a commonly used antibiotic in broilers. Carcass yield, liver weights, breast muscle values, and abdominal fat weights were reduced in groups fed with 100 or 150 g/ton of Microguard. So in the present study is aimed to see the effect of essential oil and probiotic on growth performance carcass yield of these birds.

2. Material and method
2.1 Experimental birds and housing
The present study was conducted to assess the effect of supplementation of oregano (*Origanum vulgare*) oil as phytobiotic growth promoter with probiotic on carcass yields of

Broiler Chicken. Total 240 "Ven-Cobb 400Y" strain commercial day-old broiler chicks were equally and randomly divided into 4 groups. Each treatment was again subdivided to 4 replicates with 15 chicks in each group.

2.2 Management of Bird

Before to conduct the experimental trial, the broiler shed, its boundary and the equipment were cleaned, wash and disinfected. All the broiler chicks were given glucose with drinking water immediately after arrival. The brooding temperature in the shed was maintained by using electric bulbs. The experimental broilers chicks were housed in 16 different sheds. Each shed was having 15 birds. The experimental broiler birds were also vaccinated against Ranikhet disease through intraocular route on 7th day with B1 strain, Infectious bursal disease (IBD) on 14th day of age by the intraocular route and booster vaccination of Infectious bursal disease (IBD) Invasive intermediate strain (B2K) was carried out on 21st day and vaccination of Ranikhet disease with Lasota strain on 28th day through drinking water.

2.3 Acquiring Feed Ingredients for birds

The good quality feed ingredients were acquired from the market for the preparation of experimental diets. Oregano essential oil was acquired from karma essential oil pharmaceuticals. The probiotic (encapsulated *Saccharomyces cerevisiae*) was acquired by Venkateshwara Pvt. Ltd was undergone to chemical analysis in the laboratory at the Department of Animal Nutrition, PGIVAS, and Akola. The chemical analysis of Maize and Soybean was carried out as per the procedure of AOAC, 2012 [3] (Table1). The diets were formulated for prestarter, starter and finisher chickens with standard given by BIS 2007 [6] (Table 2).

Table 1: Chemical Composition of Feed ingredients (% DM basis)

S. No.	Particulars	Maize	Soya-DOC
1	Dry matter	91.07	92.1
2	Crude protein	9	44
3	Crude fibre	2.35	6.3
4	Ether Extract	3.58	1.5
5	Total ash	1.65	2.38
6	Nitrogen free extract	83.42	58.42

Table 2: BIS (2007) Standard for broilers

BIS (2007)			
	Pre starter	Starter	Finisher
CP (%)	23	22	20
ME (kcal/kg)	3000	3100	3200

2.4 Dietary Treatment of Experimental Birds

The experimental broiler birds were given to the following dietary supplements.

Table 3: Details of the dietary treatment given to birds during the experimental period

Groups	Dietary Treatments No. of bird in replicate	No. of Replicate	No. of Birds
T_0	Standard broiler chicken diet as per BIS, 2007.	4	60
T_1	Standard broiler chicken diet as per BIS, 2007+ oregano essential oil @ 0.15 gm/kg diet	4	60
T_2	Standard broiler chicken diet as per BIS, 2007 + probiotic (encapsulated *Saccharomyces cerevisiae*) @ 200 gm/ tones)	4	60
T_3	Standard broiler chicken diet as per BIS, 2007 + oregano essential oil @ 0.15 gm/kg diet + probiotic (encapsulated *Saccharomyces cerevisiae*) @ 200 gm/ tonnes T_1)	4	60
	Total birds	16	240

2.5 Calculation of Carcass Yield

At the end of 6thweeks, two birds from each replicate were randomly selected as per the bodyweight close to the mean. The birds were starved 12 hrs and *ad-lib* access for drinking water was made available after 12 to 16 hrs. The bird was slaughtered by severing the jugular vein and allowed to bleed for 1 to 2 minutes. Defeathering was done by keeping the bird in hot water for 3-4 minutes and feathers were removed manually. Different carcass traits such as dressed carcass, edible meat yield and giblet yield were recorded and expressed in terms of live weight.

2.5.1 Boneless breast and leg meat

Deboning broiler chicken leg meat by dislocation of articular cartilage followed by stripping periosteum. The whole thickness of articular cartilage at its centre part was cut vertical to the articular surface. The cut covered the whole width of the cartilage and reached the top portion (~3 mm) of the periosteum; the cartilage was then dislocated to expose the surface of underlying growth plate attached to the subchondral bone and the portion of the cartilage attached to periosteum was pulled down to strip the periosteum tissue from the diaphysis to obtain bones (Nakano *et al.*, 2012) [18]. Breast is separated and muscles were removed from the left and right sides of each carcass.

2.6 Statistical Analysis

The data were analyzed by using Statistical Package for the Social Sciences (SPSS) Version 17.0. The differences between means were subjected to ANOVA by univariate analysis using the General Linear Model.

3. Result and Discussions

3.1 Carcass traits

The mean de-feathered weight, eviscerated weight, giblet weight, dressing yield, edible meat and abdominal fat was calculated by sacrificing eight birds from each treatment (two birds from each replicate) and are given in Table 4 & 5.

Table 4: Average per cent carcass yield in broiler

Treatment	Giblet	Dressing	Boneless breast	Boneless leg	Abdominal fat
T0	$4.32^{a}\pm0.13$	$71.74^{a}\pm0.78$	$28.33^{a}\pm1.88$	$20.52^{a}\pm0.87$	$1.97^{a}\pm0.13$
T1	$4.08^{a}\pm0.08$	$72.76^{ab}\pm0.5$	$30.9^{a}\pm0.25$	$20.49^{a}\pm0.34$	$1.93^{a}\pm0.1$
T2	$4.34^{a}\pm0.12$	$72.63^{ab}\pm0.68$	$28.98^{a}\pm1.96$	$20.5^{a}\pm0.76$	$1.72^{a}\pm0.1$
T3	$4.4^{a}\pm0.14$	$74.05^{c}\pm0.6$	$28.37^{a}\pm2.44$	$21.53^{a}\pm0.89$	$1.81^{a}\pm0.09$
Total	4.29±0.06	72.8±0.34	29.15±0.89	20.76±0.36	1.86±0.05

Treatment mean end in a column bearing common superscripts doesn't differ significantly (P<0.05)

Table 5: Average carcass yield in (g) broilers at the end of 6th week of age

Treatment	Fasting BW	Debleeding weight	Defeathering weight	Eviscerated Weight	Giblet weight
T0	2391^{a}±92.35	2319.13^{a}±90.99	2201.5^{a} ±92.78	1604.5^{a} ±85.06	102.88^{a}±2.97
T1	2395.3^{a}±46.87	2341.63^{a}±45.37	2188.25^{a} ±70.1	1648.88^{a} ±45.68	97.63^{a} ±2.08
T2	2409.5^{a}±99.95	2344.25^{a} ±98.49	2221.5^{a} ±96.53	1728.5^{a} ±97	104^{a} ±2.5
T3	2356.88^{a}±36.36	2296.5^{a}±36.85	2160.88^{a} ±52.26	1619.75^{a} ±76.75	103.5^{a} ±2.24
Total	2388.13±35.44	2325.38 ±34.93	2193.03 ±38.2	1650.41 ±38.26	102± 0.26

Treatment mean end in a column bearing common superscripts doesn't differ significantly (P<0.05)

3.1.1 Dressing percentage

There were significant differences (P<0.05; Table 4) among all treatment groups. The highest value dressing percentage was observed in treatment group T_3 was fed by oregano essential oil @ 0.15 gm/kg diet and probiotic (encapsulated *Saccharomyces cerevisiae*) @ 200 gm/ tones, followed by T2, T1 and T0. The similar result was observed by Alçiçek *et al*. (2004) [1] who observed that the dressing percentage was improved by the inclusion of the essential oils in the diet. However, Jamroz *et al.* (2003) [12] reported that dressing percentage was not changed in all groups (70.6% on average) of plant extracts and no significant improvement was observed in the treatment. Alp *et al.* (2012) [2] also seen similar results, fed with the oregano essential oil. Çabuk *et al*. (2006) [7] shown carcass yield and dressing percentage were not affected by the addition of the essential oil mixture to the diet.

3.1.2 Giblet

There were no significant differences (P>0.05; Table 4) among all treatment groups were observed in the giblet yield. The highest value for giblet percentage was observed in the treatment group T_1 (oregano essential oil @ 0.15 gm/kg diet).

3.1.3 Boneless Breast (g)

There were no significant (P>0.05; Table 4) differences among treatment groups were observed for the boneless breast. No significant differences in the analysis of variance are seen but the highest numerical value for the boneless breast was seen in the T_1 -30.9±0.25 *ie*. Group fed with oregano essential oil. Numerically lowest boneless leg meat yield percentage was found in control. Similar results were reported by Ilias *et al*. (2016) [11] who used oregano essential oil alone or as a mixture with laurel essential oil observed less fat meat with the decreased relative weight of the breast meat. Manafi *et al.* (2018) [16] compared the effects of a multispecies probiotic containing four Bacillus species and *Saccharomyces boulardii* with a commercial probiotic and a commonly used antibiotic in broilers and found no significant in breast meat weight in the treatment group whereas contrast results were obtained by Mansoub (2011) [17] who found the increase in breast weight with the use of oregano oil 200 ppm of body weight. Khattak *et al*. (2014) [13] observed the effect of a novel commercial preparation of natural blend of essential oils from basil, caraway, laurel, lemon, oregano, sage, tea, and thyme had a significant effect on breast weight in the treatment. Paryad *et al*. (2008) [19] reported that ration containing 1.5 and 2% yeast contribute to higher breast muscle yield. Jamroz *et al*. (2003) [12] studied the carcass traits of broiler chicken at 48 days of age. The highest breast and thigh meat yield were observed in the group receiving 300 ppm XT when fed with oregano essential oil. While breast muscle shares in the experimental groups were 1.8 -3.6% higher than in the control group, Edward *et al*. (2004) [8] studied the effect of dietary supplementation of oregano oil (*Origanum sp*.), carcass trait of broiler chickens and reported the highest per cent of breast yield was in experimental group 3 (200 ppm of oregano oil). Lehmann *et al*. (1996) [14] given the relation between a numerically increase in breast meat and increased dietary availability of lysine and threonine in young turkey and reported that better breast muscle retention in the body of chicken was due to increases in apparent ileal digestibility of lysine and threonine. This might be the reason for the increase in the breast muscle size in the birds of T_3 and T_2 group.

3.1.4 Boneless leg (g)

From the table of values of boneless leg meat yield percentage of the carcass was found to be non-significant (P>0.05; Table 4). Numerically lowest boneless leg meat yield percentage was found in Oregano essential oil group (T_1). The contrast results were observed by Paryad *et al.* (2008) [19] who found the inclusion of 1.5% of yeast improved leg meat compared with control. The results were per Ilias *et al*. (2016) [11] who reported that the effects of essential oils of oregano laurel and their combination on thigh meat weight were significantly lower than the control group.

3.1.5 Abdominal Fat

There were non-significant (P>0.05; Table 4) differences among treatment groups. The highest abdominal fat yield was seen in T_0 - 1.97±0.13. These results are per Haj Ayed *et al*. (2004) [10] and Jamroz *et al*. (2003) [12] reported that abdominal fat in the percentage of live body weight was significantly (P<0.05) lower in the group fed the diet supplemented with 150 ppm XT, whereas in the other groups these values ranged between 1.40 - 1.66% of body weight. The present results are in contrast with Edward *et al.* (2004) [8] who studied the effect of dietary supplementation of Oregano oil (*Origanum sp*.) medicinal plant on, carcass trait of broiler chickens. The lowest per cent of abdominal fat was observed in the experimental group fed 150 ppm of oregano oil compared with the control.

4. Conclusions

From the results obtained, it is concluded that the performance in commercial broiler chickens fed with Oregano (*Origanum Vulgare*) Oil as Phytobiotic Growth Promoter with Probiotic (encapsulated *Saccharomyces cerevisiae*) in broiler chicken showed a positive impact on growth performance and increases their carcass yields.

5. References

1. Alçiçek Bozkurt M, Çabuk M. The effects of a mixture of herbal essential oil, an organic acid or a probiotic on broiler performance. S. Afr. J Anim. Sci. 2004; 34:217-222.
2. Alp M, Midilli M, Kocabağlı N, Yılmaz H, Turan N, Gargılı A *et al*. The effects of dietary oregano essential oil on live performance, carcass yield, serum immunoglobulin G level, and oocyst count in broilers J

Appl. Poult. Res. 2012; 21:630-636.
3. AOAC. Association of Official Analytical Chemist, official Method of Analysis of AOAC international, 19th Edn. Washington D.C., U.S.A, 2012.
4. Awaad MH, Elmenawey HM, Kawkab Ahmed A. Effect of a specific combination of carvacrol, cinnamaldehyde, and on the growth performance, carcass quality and gut integrity of broiler chickens. Vet. World, EISSN: 2231-0916, 2014.
5. Barrow PA. Probiotics for chicken (In Probiotics: The scientific basis, ed. by R. Fuller). Chapman and Hall, London, 1992, 225-257.
6. BIS. Nutrient Requirements of Poultry. Bureau of Indian Standards, 5th revision. New Delhi, India, 2007.
7. Çabuk M, Bozkurt, Alçiçek A, Akbaş Y, Küçükyılmaz K. Effect of a herbal essential oil mixture on growth and internal organ weight of broilers from young and old breeder flocks S. Afr. J Anim. Sci. 2006; 36(2).
8. Edwards J, Buck V, Shawcross R, Dawson S, Dunn M. The effect of essential oils on methicillin resistant Staphylococcus aureus using a dressing model. Burns. 2004; 30:772-777.
9. FAO/WHO. Guidelines for the evaluation of probiotics in food, Food and Agriculture Organization of the United Nations and World Health Organization Working Group Report, London Ontario, Canada), 2002.
10. Haj Ayed M, Laamari Z, Rekik B. Effects of incorporating an antibiotic "Avilamycin" and a probiotic "Activis" in broiler diets. American Society of Ani. Sci. 2004; 55:237-240.
11. Ilias G, Tzora A, Sarakatsianos I, Karamoutsios A, Skoufos S, Papaioannou N *et al*. The effectiveness of the use of oregano and laurel essential oils in chicken feeding. Ann. Anim. Sci. 2016; 16(3):779-796.
12. Jamroz D, Orda J, Kamel C, Wiliczkiewicz A, Wertelecki T, Skorupińska J. The influence of phytogenic extracts on performance, nutrient digestibility, carcass characteristics, and gut microbial status in broiler chickens. Int. Jamroz d. *et al*. J Anim. and Feed Sci. 2003; 12:583-596.
13. Khattak F, Ronchi A, Castelli P, Sparks N. Effects of natural blend of essential oil on growth performance, blood biochemistry, cecal morphology, and carcass quality of broiler chickens Poult. Sci. 2014; 93:132-137.
14. Lehmann D, Pack M, Jeroch H. Effects of dietary threonine in starting, growing, and finishing turkey toms. Poult. Sci. 1997; 76:696-702.
15. Manafi M, Hedayati M, Khalaji S. Effectiveness of phytogenic feed additive as alternative to bacitracin methylene disalicylate on hematological parameters, intestinal histomorphology and microbial population and production performance of Japanese quails. Asian-Australas. J Anim. Sci. 2016; 29(9):1300-1308.
16. Manafi M, Hedayati M, Khalaji S. Effectiveness of phytogenic feed additive as alternative to bacitracin methylene disalicylate on hematological parameters, intestinal histomorphology and microbial population and production performance of Japanese quails. Asian-Australas. J Anim. Sci. 2016; 29(9):1300-1308.
17. Mansoub. Performance, carcass quality, blood parameters and Immune System of broilers fed diets supplemented with oregano oil (*Origanum* sp.). Annals of Biological Research. 2011; 2(6):652-656.
18. Nakano T, Ozimek L, Betti M. Deboning broiler chicken legs and wings by dislocation of articular cartilage followed by stripping periosteum. Poult. Sci. 2012; 91:2938-2941.
19. Paryad A, Mahmoudi M. Effect of different levels of supplemental yeast (*Saccharomyces cerevisiae*) on performance, blood constituents and carcass characteristics of broiler chicks. Afr. J Agric., Res. 2008; 3(12):835-842.
20. Peng Li, Peng QY, Li JD, Li Z, Duan ZY, Wu YP. Effects of dietary supplementation with oregano essential oil on growth performance, carcass traits and jejunal morphology in broiler chickens. Anim. Feed Sci. and Tech. 2016; 214:148-153.
21. Sarica S, Corduk M, Yarim GF, Yenisehirli G, Karatas U. Effects of novel feed additives in wheat based diets on performance, carcass and intestinal tract characteristics of quail South Afr. J of Anim. Sci. 2009; 39(2).