Research Article

Effect of Dietary Thyme Essential Oil on Carcass Parameter of Broiler Chickens

M.R. Wade*[1], Satish Manwar[1], S.V. Kuralkar[2], Sunil Waghmare[3], V.C. Ingle[4] and Sunil Hajare[5]

[1]Poultry Research Center, Department of Poultry Sciences, Post graduate Institute of Veterinary and Animal Sciences, Akola, Maharashtra, India
[2]Department of Animal Genetics and Breeding, Post graduate Institute of Veterinary and Animal Sciences, Akola, Maharashtra, India
[3]Teaching Veterinary Clinical Complex, Post graduate Institute of Veterinary and Animal Sciences, Akola, Maharashtra, India
[4]Department of Veterinary Microbiology, Nagpur Veterinary College, Seminary Hills, Nagpur, Maharashtra, India
[5]Department of Veterinary Pharmacology and Toxicology, Post graduate Institute of Veterinary and Animal Sciences, Akola, Maharashtra, India

Abstract

An experiment was conducted to study the effect of thyme essential oil on the carcass parameter of broiler chickens. Two hundred fourty Mareks disease vaccinated straight run day-old commercial broiler chicks were equally and randomly distributed into four treatment groups which were subdivided into three replicates containing 20 chicks in each, reared on deep litter system in pens up to 6 weeks of age. The dietary treatment groups were the Control diet without Thyme essential oil (A), Broiler ration containing Thyme essential oil, 100 mg/kg diet (B), Broiler ration containing Thyme essential oil, 200% mg/kg diet (C). Broiler ration containing Thyme essential oil, 300 mg/kg diet (D).The results reveal that the) higher dressing yield was obtained in B group. Significantly ($P<0.05$) higher Breast %, Thigh% and back % was obtained in thyme oil supplemented group than control. However, Giblet yield and drumstick % were not affected in thyme oil supplemented groups. In conclusion, the feed supplemented with thyme essential oil at 100mg/kg resulted in improved dressing yield and cut up parts of carcass traits.

Keywords: Broiler Chicken, Thyme Essential oil, Carcass traits

***Correspondence**
Author: M.R. Wade
Email: drmangeshwade@gmail.com

Introduction

Selection of meat-type chickens has previously focused not only on increased growth performance but also on improved carcass quality [1].Carcass evaluation in poultry considered as an important part of poultry-processing activities because it involves observation of standards and quality for the birds according to grading and expected yield [2]. The profitability of broiler production is therefore largely determined by the possibility of increasing the proportion of prime parts in the carcass, mainly breast meat, and by reducing fat [1]. In broiler production herbs as feed additive has been used for improved growth performance and carcass quality [2-4].Plant extracts, such as essential or volatile oils, are usually utilized in poultry feeding and are considered growth and immune enhancers due to their antioxidant, antimicrobial and digestion properties[5]. Thyme (Thymus vulgaris) is medicinal herbs and is reported to increase appetite and feed intake as well as the secretion of endogenous digestive enzymes, and to strengthen the immune system when added to poultry feed, owing to the phenolic compounds it contains [6]. The beneficial value of thyme in poultry has been reported by Al-Kassie et al. [7] and Attia et al. [8].The aim of this work was to determine the effect of thyme essential oil supplemented in the diet on the carcass parameters of the broiler chickens

Materials and Methods

Two hundred forty day old straight run broiler chicks of "*Vencobb*" strain were purchased from private hatchery. The chicks were equally and randomly distributed in to four treatment groups. Each treatment groups were further divided in to three replicates with twenty chicks in each. The dietary treatment groups were the Control diet without Thyme essential oil (A), Broiler ration containing Thyme essential oil, 100 mg/kg diet (B), Broiler ration containing Thyme

essential oil, 200% mg/kg diet (C). Broiler ration containing Thyme essential oil, 300 mg/kg diet (D). The chicks were reared on deep litter system in pens up to 6 weeks of age. The feed was provided as per treatment and water was provided *ad-lib* to all the treatment groups throughout the experimental period. The broiler pre starter feed was provided up to seven days, later on broiler starter and broiler finisher feed were provided from second to third and fourth to six weeks of age, respectively. Uniform managemental practices were provided throughout the experimental period i.e. up to six weeks of age for all the treatments groups. The feed was provided as per treatment and water was provided *ad-lib* to all the treatment groups throughout the experimental period. The chicks were vaccinated against Ranikhet and Gumboro disease vaccines at 7th and 14th days, respectively. At the end of the experiment, six no. of birds from each treatment group were randomly selected to determine the various carcass yields like dressing yield, giblet yield and cut up parts. Processing (slaughter, bleeding, scalding and defeathering) of birds was carried out following standard procedures. The dressed weight of the carcass was noted after removing head, shank, tip of wings and oil glands and expressed on basis of pre-slaughtered live weight percentage. Evisceration was done following standard procedures. The gall bladder was detached from liver, heart was freed from pericardium, internal clots and adhering vessels, and gizzard was cleaned by removing the inner lining and faecal materials. These were weighed separately and expressed as relative weight (g/kg live weight). The liver, gizzard and heart were collected and considered as giblet, collectively. The data obtained on various parameters studied during this experimental trial were subjected to statistical analysis as described by Snedecor and Cochran [9].

Results and Discussion

Dressing yield (%)

Studies on carcass characteristics of broiler revealed that the dressing yield was numerically higher in group B (77.5±0.42) followed by group C (77.17±0.99), group D (75.59±0.79) and lowest in control group A i.e. (74.75±0.76).These results are in agreement with Abdulkarimi et al [10] who found numerically higher dressed yield in thyme extract fed broiler at dose 0.6 percent. Similar finding was observed by Amouzmehr et al [11] who also used 0.6 percent thyme extract. Thogyani et al [4] observed birds receiving 5g/kg thyme had the highest carcass yield percentage although, the differences were not statistically significant. AL-Kassie [7] noted that the chicks fed with 200 ppm essential oils derived from thyme had higher dressing yield, Recently, Ragaa et al. [12] reported the higher dressing yield in 1g/kg diet thyme fed birds. Enhancement of the metabolism of oil, carbohydrates and proteins in the major organs would increase growth rate of these organs [13].

Table 1 Dressings yield (%), Giblet yield (%) and cut up parts of broilers under various treatment groups' g/kg live weight

Treatment groups	Dressing %	Breast	Thigh	Drumstick	Back	Giblet
A	74.75 ±0.76	27.41^{b} ±0.35	9.44^{ab} ±0.19	9.23 ±0.15	11.94^{b} ±0.17	4.24 ±0.12
B	77.54 ±0.42	29.74^{ab} ±0.40	9.00^{b} ±0.27	9.67 ±0.32	12.42^{ab} ±0.29	3.73 ±0.16
C	77.17 ±0.99	30.22^{a} ±1.21	9.08^{b} ±0.36	9.12 ±0.31	12.79^{a} ±0.21	3.82 ±0.18
D	75.59 ±0.79	27.61^{b} ±0.96	10.19^{a} ±0.24	9.68 ±0.34	11.97^{b} ±0.20	3.95 ±0.13
CD	NS	2.407	0.792	NS	0.652	NS
CV	2.465	6.952	6.970	7.493	4.395	9.283

Means with at least one common superscript in a row do not differ significantly (P<0.05).

Giblet Yield (%)

Among the treatments, the percentage of giblet was obtained non significant(P>0.05). The similar finding was observed by Cabuk et al. (2006) [14] who found that some internal organ weights such as the liver, heart, gizzard and small intestine were not affected by the addition of the essential oil mixture to the diet. Lee et al. (2004) [15] who reported that thymol did not influence liver weight and Heart weight [3]. Also the reports by Ocak *et al.* [16] (2008) indicated no statistical variations the relative weights of the edible inner organs of broilers fed diets supplemented with peppermint and thyme essential oil.

Cut up parts (%)

The Cut up parts viz. breast, thigh and back was obtained the significantly ($P<0.05$) higher in thyme essential oil supplemented birds than the control birds. However, a difference in drumstick was not statistically significant. These results are similar attributed with AL-Kassie [7] who noted that the chicks fed with 200 ppm essential oils derived from thyme had higher breast yield, thigh yield and back yield. Raga et al, [12] reported significantly higher breast yield and thigh yield in birds fed diet thyme 1g/kg. The improved carcass traits might be due to utilization of nutrient from diet. Amino acids especially lysine is critical for muscle development such as breast muscle. The relationship between the dietary lysine level and breast weight (%) has been confirmed [17].The non beneficial intestinal bacteria stimulate the lysis of amino acids and di-aminasion process and consequently reduces the availability of lysine for broilers [18], the antimicrobial properties of thyme possibly prevents the lysis of lysine and increase the lysine absorption and hence enhanced breast and other relative weights of carcass [10].

Conclusions

In conclusion, the feed supplemented with thyme essential oil at 100 mg/kg resulted in improved dressing yield and cut up parts of carcass viz. breast yield, thigh yield and back yield. However, giblet and thigh yield were not affected by addition of different doses of thyme oil in broilers diet.

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