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Article

The effect of locally extracted and imported aloe vera oil on some productive traits of broilers

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ABSTRACT

The study was conducted at a poultry field, Agricultural Research and Experiment Station at the College of Agriculture, Al-Muthanna University, to determine the effect of locally extracted and imported aloe vera oil on some productive traits of broilers, different levels of oil extracted from the leaves of the aloe vera plant were used, from 22/2/2022 to 29/3/2022. A total of 405 unsexed, one-day-old chicks of Ross 308 broiler were used; chicks were randomly distributed to nine treatments with three replicates for each, 45 chicks per treatment (15 chicks for each replicate), the treatments were followed; T1: without any addition, as for the treatments T2, T3, T4 and T5, they were local aloe vera oil and the treatments T7, T6, T8 and T9, they were imported aloe vera oil, the addition of oil was at the levels 0.3 and 0.4 per kg feed. The results of the experiment indicated a significant improvement in some productive traits, including Body Weight (BW), Weight Gain (WG), Feed Intake (FI) and Feed Conversion (FC), with a significant decrease in mortality for all treatments of locally extracted and imported oil compared to the control treatment, the treatments of the oil extracted locally showed the best results in a significant way compared to the rest of the treatments of the imported oil of the aloe vera plant.

Keywords: Locally extracted, imported, aloe vera oil, productive traits, broilers.

INTRODUCTION

Aloe vera (Aloe barbadensis Miller) is a perennial plant belonging to the family Aloaceae, distinguished by its green leaves [1]. Aloe vera is a drought-tolerant herbaceous succulent plant and a perennial tropical plant with green leaves that ripens after 7-8 months of planting. It has a large base. Leaves are approximately 25-30 cm long and 10 cm wide. The number of sheets varies between 12 and 16 leaves. Thorns surround the sides of the leaves, and at the base of the leaves are short stems; the plant is a little branched, and the lifespan of the total plant is approximately 12 years [2].

Aloe vera is an ancient medicinal plant used in many fields and contains many active compounds, more than 200; numerous studies have shown that the aloe vera plant contains compounds that significantly impact humans and animals through its physiological impact [3]. Aloe vera leaves contain many antioxidants, including phenols, vitamin C, tannins, flavonoids, and soaps; Aloe vera leaves also contain antioxidant enzymes. [4]. It contains olein at a concentration of 1499.1 µg/ g. The gel and peels of Aloe vera leaves contain chemical ingredients (Tanine, saponins, flavonoids, carbohydrates, anthraquinones, phenolics, triterpenes, sterols, and alkaloids), and different concentrations of phenolic compounds; the aloe vera plant improves the immune response and increases cellular and humoral immunity (Sinha et al., 2017).

Adding aqueous extract of aloe vera leaves at a level of (50, 100) mg/liter of drinking water for 30 days for broilers increases the immune response to viruses. Bacteria in the intestines play an important role in poultry, leading to the utilization of food and thus improving growth and immunity [5,6].

MATERIALS AND METHODS

The study was conducted at the poultry field, Agricultural Research and Experiment Station, Agriculture College, Al-Muthanna University, to determine the effect of aloe vera oil extracted locally and imported on some productive traits of broilers, different levels of oil extracted from the leaves of the aloe vera plant, from 22/2/2022 to 29/3/2022.

405 unsexed, one-day-old chicks of Ross 308 broilers were used. Chicks were randomly distributed to nine treatments with three replicates for each, 45 chicks per treatment (15 chicks for each replicate). The treatments were followed: T1: without any addition, as for the treatments T2, T3, T4 and T5, they were local aloe vera oil and the treatments T7, T6, T8 and T9, they were imported aloe vera oil, the addition of oil was at the levels 0.3 and 0.4 per kg feed. The birds were reared on four-story batteries; each floor containing a cage with dimensions of 1×1.5 m. The Aloe vera leaves were brought from the Aloe vera farm in Anbar Governorate, and the oil was extracted locally in two ways:

Extraction by water bath

Cut the leaves of the plant into tiny pieces, then put it in a glass container with a quantity of corn oil, close it tightly, place it in a water bath, and leave it on the fire for an hour. Then we notice the oil separation from the water, leave it for a few minutes to cool, place it in the cooling to facilitate the separation of oil from water, then separate it and place it in cans and keep it in a cool and dry place. [7]

Extraction by saturation method with fats or oils

Aloe vera leaves are placed in the electric mixer to get an amount of aloe vera juice. After getting an amount of aloe vera juice, put an equal amount of corn oil on the fire. Leave it on the fire for about 45 minutes, where all the water is evaporated, and only the olive oil remains with the remains of the plant, then the oil is filtered to obtain pure oil, left to cool, and then packed in special containers, store in a cool, dry place. [7].

Productive traits

Body Weight (BW), Weight Gain (WG), Feed Intake (FI) and Feed Conversion (FC).

Statistical analysis

A Complete Randomized Design (CRD) was used to study the effect of different treatments on the studied traits; significant differences between means were compared with [8] multiple-range tests under significance levels of 0.05 and 0.01. The program [9] was used in the statistical analysis.

RESULTS

Table (1) shows the effect of using the oil extract of aloe vera leaves on average body weight, weight gain, feed intake and feed conversion at 21 days of broilers. Significant differences were among all the experimental treatments at 21 days of the chick's age. In contrast, treatment T3 (0.4 ml oil extract of aloe vera leaves / kg of feed) was significantly superior ($P \leq 0.05$) compared to the other treatments concerning body weight, weight gain, feed intake and feed conversion, continued superiority of treatment T3 significantly ($P \leq 0.05$) compare with T2, T4, T5 and T6 treatments, there were no significant differences between the treatments T2, T4 and T5, and these treatments, outperformed compare with T7, T8, T9 and T1, as for the weight gain, T3 (0.4ml oily extract of aloe vera leaves/kg feed) significantly increase ($P \leq 0.05$) compare with other the treatments (T2, T4, T5, T6, T7 and T8) which outperformed treatment T1. As for the feed intake, a significant improvement ($P \leq 0.05$) was observed for all the treatments of the local oil extract (T2, T3, T4, and T5) compared with T6, T7, T8, and T9, which in turn outperformed compare with T1. As for the feed conversion, a significant

superiority (P≤0.05) continued for T3 compared with other the treatments, where treatment T3 outperformed treatment T4 and T5, which in turn outperformed T2, T6, T8, T9, T7 and T1

Table 2 shows a significant increase in the relative weight of the main cuts (breast, thigh and drumstick) with a significant decrease in the relative weight of the secondary cuts (neck, wings and back) for all treatments of locally extracted aloe vera oil compared to the imported Aloe vera oil treatments and the control treatment. Tables 3, 4 and 5 show that the relative weight of meat in the main cuts (chest, thigh and atta drum) significantly increased in treatments (T2, T3, T4 and T5) compared to treatments T6, T7, T8 and T9, which in turn were significantly superior compared to the control treatment for meat In all the studied significant cuts, as for the bone and skin of all the studied major cuts, there was a significant decrease in treatments (T2, T3, T4 and T5) compared to treatments (T6, T7, T8 and T9), which decreased significantly compared to the control treatment.

Table 3 shows the effect of using the oil extract of the leaves of the aloe vera plant on the dressing percentage, where the significant superiority (P≤0.05) of the treatment T3 (0.4 ml aloe vera leaves oil extract / kg of feed) compared to the treatment T2, T4 and T5, which significantly outperformed compared to the treatments T6 and T7, which significantly outperformed compared to treatments T8 and T9, which excelled compared to the control treatment, where we note the continued superiority of treatment T3 significantly (P≤0.05) compare with the other treatments with respect to the percentage of purification without giblet, as there were no significant differences among the treatments with respect to the relative weight of the heart, as for the relative weight of the liver, we note the continued superiority of T3 significantly compare with the treatments T2 and T4, which was significantly superior (P≤0.05) compared to treatments T6 and T7, which was significantly superior compared to treatments T8 and T9, they outperformed the control treatment. The continued superiority of the T3 treatment was significant concerning the relative weight of the gizzard and the dressing percentage with the giblet compared with the other treatments.

Treatments	Body weight (g)	Weight Gain (g)	Feed Intake (g)	Feed Conversion (g diet/ g weight gain)
T_1	4.40±668.33c	5.13± 302.00e	9.75±498.33c	.01±1.65f0
T_2	3.75±684.55ab	3.57±311.69abc	2.87±443.56a	.01±1.42ab0
T_3	0.84± 690.00a	.62±317.26a0	2.35±440.98a	0.01±1.39a
T_4	1.36±683.55ab	0.77±311.04abc	2.21±448.94a	0.00±1.44b
T5	ab0.61±685.11	.75±314.84ab0	4.98±449.18a	0.01±1.42b
T6	±679.06b1.74	.71±309.48bcd0	2.30±470.40b	0.01±1.52cd
T7	±680.89b1.05	.58±312.22ab0	.80±467.29b0	0.003±1.49c
T8	c0.58±669.89	1.25±302.55cd	1.20±471.96b	0.01±1.56e
T9	±672.11c1.34	2.39±304.37cde	6.12±468.70b	0.02±1.54de
Sig.	*	*	*	*

Table 1: Effect of locally extracted and imported aloe vera oil on some productive traits of broiler broilers at the age of 21 days (mean ± standard error).

Treatments	Body weight (g)	Weight Gain (g)	Feed Intake (g)	Feed Conversion (g diet/ g weight gain)
T_1	17.32± 1650.00d	18.90±568.66d	32.11±1072.64a	.006±1.88g0
T_2	2.08±1851.00a	4.09±728.66ab	7.54±1204.73b	0.003±1.65b
T_3	2.60± 1865.66a	2.72±731.33a	7.54±1196.96b	0.006±1.63a
T_4	3.21± 1849.00a	2.84±728.66ab	8.13±1236.32b	0.006±1.69c
T5	±1850.33a2.96	.88±728.33ab0	3.86±1226.03b	0.003±1.68c
T6	±1818.33b2.72	4.58±702.00c	12.67±1237.92b	0.006±1.76d
T7	±1824.66b3.28	2.02±706.66bc	4.41±1239.02b	0.003±1.75d
T8	±1776.66c3.28	5.68±688.00c	8.05±1284.21c	0.006±1.86f
T9	±1780.00c6.35	6.08±694.00c	9.18±1281.55c	0.003±1.84e
Sig.	*	*	*	*

Table 2: Effect of locally extracted and imported aloe vera oil on some productive traits of broilers aged 35 days (mean ± standard error).

Treatments	Weight Gain (g)	Feed Intake (g)	Feed Conversion (g diet/ g weight gain)
T_1	17.32±1610.00d	28.13±2761.04a	.003±1.71g0
T_2	2.08±1811.00a	2.22±2813.76b	0.003±1.55b
T_3	2.60±1825.66a	9.37±2794.73ab	0.005±1.53a
T_4	3.21±1809.00a	8.82±2860.36c	0.005±1.58c
T5	2.96±1810.33a	11.85±2836.12bc	0.003±1.56b
T6	2.72±1778.33b	15.05±2898.28def	0.005±1.63d
T7	3.28±1784.66b	9.63±2889.61de	0.006±1.61d
T8	3.28±1736.66c	8.69±2938.54f	0.003±1.69f
T9	6.35±1740.00c	9.89±2914.72ef	0.003±1.61e
Sig.	*	*	*

Table 3: Effect of locally extracted and imported Aloe vera oil on some of the total productive characteristics of broilers (mean ± standard error).

DISCUSSION

Regarding body weight gain, this increase is due to the aloe vera plant containing the active compounds found in aloe vera gel to reduce the growth of pathogenic bacteria [10]. The aloe vera plant also contains the active compound saponins, which has an influential role in increasing the permeability of the intestinal cell wall, thus increasing the absorption of nutrients [11]. Also, aloe vera gel increases the growth of beneficial bacteria (Lactobacillus), which produces lactic acid, organic and fatty acids, and hydrogen peroxide, increasing beneficial bacteria's growth [12]. The aloe vera plant contains many antioxidant vitamins (A, C and E) [13]. The significant improvement that occurred in the weight of the carcass and the weight of the main cuts due to the presence of a large number of active compounds in the leaves of the aloe vera plant, which has a significant role in improving feed consumption and absorption, then increase growth and build tissues and muscles, as the active compound saponins have a significant role in increasing the utilization of nutrients by increasing the permeability of cell wall amino acids (Kim, 14) and fatty acids [15], which play an essential role in increasing feed consumption, then weight gain, and thus improving the characteristics of the carcass. Also, the aloe vera plant increases the growth of beneficial bacteria (Lactobacillus), which produces lactic acid and many other compounds, proving harmful bacteria's growth and thus improving growth and weight gain [16].

CONCLUSIONS

The results of the experiment indicated a significant improvement in carcass traits for broilers (carcass weight, dressing percentage without giblet, the relative weight of liver, heart and gizzard, the dressing percentage with giblet, the main cut and secondary cuts) and deboning percentage. The oil extracted locally showed the best results significantly compared to the rest of the treatments of the imported oil of the aloe vera plant. The current concluded is to determine the effect of locally extracted and imported aloe vera oil on some productive characteristics of broilers.

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