Effect of dietary inclusion of *Moringa oleifera* leaf powder on hematological parameters and carcass traits of broiler chickens

Ammar Mahmoud Mostafa [1*]

[1] Department of Animal Production, Faculty of Agricultural Engineering, Lattakia University, Syria.

(*Corresponding author: Ammar Mostafa, Email: ammarmostafa110@gmail.com)

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Abstract

The poultry industry is considered one of the most advanced livestock sectors, relying on precise feeding and management systems aimed at achieving the highest production efficiency and meat quality. In the context of efforts to enhance the physiological and immune status of birds through the use of safe natural components, increasing attention has been directed toward plant-based additives with bioactive properties. Moringa oleifera is a plant rich in proteins, antioxidants, and anti-inflammatory compounds, making it a promising option in poultry nutrition. This study aimed to evaluate the effect of incorporating different levels of moringa leaf powder into the diet of broiler chickens on selected hematological parameters and carcass traits. A total of 72 one-day-old Ross 308 chicks were used in the experiment and distributed into four treatments, with three replicates per treatment (6 birds/replicate). The first group (T1) received a basal diet without supplementation, while groups T2, T3, and T4 were fed diets supplemented with moringa leaf powder at levels of 0.1%, 0.3%, and 0.6%, respectively, for a period of 42 days. The results revealed a significant improvement ($P \leq 0.01$) in red blood cell count, hemoglobin concentration, and packed cell volume, along with a significant increase in white blood cell count and a reduction in the H/L ratio. Moreover, a significant improvement ($P \leq 0.05$) was observed in dressing percentage and the weights of major cuts (breast and thighs), accompanied by a marked reduction in abdominal fat. These findings indicate that the inclusion of moringa leaf powder up to a level of 0.6% can improve hematological indices and carcass traits, highlighting its potential as a promising natural additive in broiler diets.

Keywords: Broiler chickens; *Moringa oleifera* leaf powder; hematological parameters; carcass traits.

Introduction:

The poultry industry faces significant challenges related to the prevalence of infectious diseases, which result in direct economic losses, in addition to concerns regarding the safety and quality of animal products (Mak *et al*., 2022). For many years, this industry has relied on antibiotics as feed additives to enhance growth and combat bacterial pathogens (Paintsil *et al*., 2021). However, excessive use of antibiotics has been associated with adverse effects, most notably the development of microbial resistance, posing a direct threat to both animal and human health (Felter *et al*., 2021; Pothineni and Keller, 2023). Consequently, the use of certain antibiotics has been banned or restricted

in many countries, prompting researchers to explore safe and effective natural alternatives capable of improving the productive and health performance of broiler chickens (Ayalew *et al*., 2022).

In this context, plant-derived ingredients have received increasing attention as alternative feed additives. Tree leaves, in particular, are characterized by their abundance and high nutritional value, as they contain proteins and essential amino acids, in addition to vitamins and minerals. They are also rich in bioactive compounds such as polyphenols, flavonoids, alkaloids, carotenoids, saponins, and tannins, which have been associated with multiple pharmacological properties, including immune enhancement and anti-inflammatory and antioxidant effects (Ashour *et al*., 2020; Tokofai *et al*., 2020). In the same context, *Moringa oleifera* has recently attracted considerable interest from researchers as a natural product with significant health benefits for poultry. *Moringa oleifera* is a tree native to northern India, but it is also distributed in other tropical and subtropical regions (Patil *et al*., 2022). Studies have shown that a day/night temperature of 30/20 °C is optimal for moringa germination, growth, and development. *Moringa oleifera* plants prefer well-drained sandy loam soils due to their sensitivity to waterlogged conditions. Fertilizer application is recommended to improve plant growth and increase forage yield in areas with low rainfall and high temperatures. For forage production, a spacing of 20 × 20 cm is suitable for planting 16,000 plants per hectare (Abdoun *et al*., 2023).

Specifically, the use of whole *Moringa oleifera* plants as an unconventional feed in ruminant nutrition has been highlighted, in addition to the use of moringa leaves or their extracts as a protein source for broiler and layer chickens. Moreover, the inclusion of moringa leaves in animal diets is likely to extend the shelf life of animal products during storage and processing (Abdoun *et al*., 2023). *Moringa oleifera* has recently received considerable attention from researchers as a natural product with substantial health benefits for poultry. *Moringa* is renowned for its antimicrobial, antioxidant, anti-inflammatory, cholesterol-lowering, and immune-modulating properties, as well as its ability to stimulate digestive enzymes in the stomach, owing to its content of hundreds of essential compounds (Khan *et al*., 2021). Alongside its benefits, it also exhibits severe toxic and abortifacient effects when consumed in large quantities (Pareek *et al*., 2023).

Moringa oleifera leaves stand out in particular, as they contain 13.41–63.11% carbohydrates, 10.74–30.29% protein, 7.09–35% crude fiber, and 6.5–20% fat (Patil *et al*., 2022; Falowo *et al*., 2018). They are characterized by a low content of anti-nutritional factors, while being rich in vitamins and bioactive phytochemicals such as carotenoids and glucosinolates. This biochemical diversity has been associated with medicinal and preventive properties. Due to these advantages, interest in the use of *moringa* is increasing, both as a dietary component for poultry and as a key ingredient in the development of functional foods (Kashyap *et al*., 2022).

At the level of applied poultry studies, encouraging results have been reported. The inclusion of 100 mg/kg of *Moringa oleifera* leaf powder improved hematological parameters and carcass traits compared to the control and antibiotic-supplemented groups, reflecting its role as a natural supplement in enhancing poultry health and meat quality (Akib *et al*., 2024). In another study, dietary supplementation with 0.5% and 0.75% *Moringa* leaf powder contributed to improvements in carcass characteristics and certain hematological indices (Kairalla *et al*., 2023). At higher inclusion levels (1%, 3%, 5%, and 7%), carcass traits were enhanced notably at the 3% level (Alwaleed *et al*., 2020).

Broiler chickens may be exposed to oxidative stress even under optimal rearing conditions, as a result of natural metabolic processes associated with rapid growth and energy production. This leads to the generation of reactive oxygen species beyond the capacity of the body's antioxidant defenses. Studies have shown that oxidative stress occurs even in modern production systems under ideal rearing

conditions, and it can be alleviated through the use of natural antioxidants such as plant extracts to promote bird health and productive performance as an alternative to antibiotics (Oke *et al*., 2024). Based on this, the utilization of moringa leaf powder in broiler diets may represent an important step toward safe and sustainable production, while reducing reliance on antibiotics and costly additives. Despite the positive outcomes, further studies are still needed to determine the optimal and most economically feasible inclusion levels and to better understand the mechanisms of action. Accordingly, this study aims to evaluate the effect of different levels of *moringa* leaf powder as a natural feed component on blood health and carcass traits in broiler chickens.

Materials and Methods:

The experiment was conducted over a period of 42 days, from June 12 to July 23, 2025, at a private farm in Tartous Governorate, Syria.

Preparation of Moringa Leaf Powder:

Dried *Moringa* leaves were obtained from a commercial medicinal plant supplier in Tartous Governorate.

The dried leaves were ground using an electric grinder to produce a fine, homogeneous powder. The powder was then stored in airtight bags, protected from moisture and light, until further use.

Birds and Experimental Design:

A total of 72 one-day-old Ross 308 broiler chicks with an initial average body weight of 40 ±1 g were used in the experiment. The chicks were randomly allocated into four treatment groups, each consisting of 18 birds divided into three replicates of 6 birds per replicate.

Bird Management and Feeding:

The rearing house was prepared following standard biosecurity measures prior to the start of the experiment. Birds were reared on a 5-cm thick wood shavings litter within a semi-closed house. Temperature, ventilation, lighting, and hygiene conditions were maintained according to standard broiler management practices. The temperature was set at 32–33 °C during the first two days and subsequently reduced by 2 °C per week until the end of the experiment. Lighting was provided 24 h/day during the first week and 22 h/day thereafter until the end of the trial.

The birds were fed a formulated diet meeting the nutrient requirements of Ross 308 for the starter phase (1–21 days) and finisher phase (22–42 days), according to the National Research Council (NRC, 1994), as detailed in Table (1). Diets for the experimental groups were prepared and supplied as follows:

T1: Control (0% *Moringa oleifera* leaf powder)
T2: 0.1% *Moringa oleifera* leaf powder
T3: 0.3% *Moringa oleifera* leaf powder
T4: 0.6% *Moringa oleifera* leaf powder

Biosecurity measures were strictly applied throughout the experiment. Birds were vaccinated via drinking water against the following diseases:

Newcastle disease (Clone 30) on days 7, 21, and 32
Infectious bronchitis (H 120) on day 7
Gumboro disease (Gumboro TM) on day 14

Table (1): Feed ingredients used, and chemical composition

Ingredients	Starter (1-21 days) %	Finisher (22-42 days) %
Yellow corn	54.8	59.4
Soybean meal	39.2	34.68
Soy oil	3	3.5
Dicalcium phosphate	1.4	1
Calcium carbonate (limestone)	0.7	0.6
Free methionine	0.18	0.15
Iodized table salt	0.25	0.2
Choline chloride	0.07	0.07
Vitamin and mineral premix*	0.4	0.4
Total	100	100
Chemical composition		
Crude protein %	22	18
Metabolizable energy(Kcal/kg)	2920	3025
Calcium %	1	0.9
Available phosphorus %	0.45	0.42
Lysine %	1.2	1.1
Methionine %	0.52	0.48
Sodium %	0.18	0.17

Notice: * The vitamin and mineral premix included per 1 kg of ready-made feed: 13,000 IU vitamin A, 5000 IU vitamin D3, 80 mg vitamin E, 4 mg vitamin K3, 6 mg vitamin B1, 8 mg vitamin B2, 4 mg vitamin B6, 0.02 mg vitamin B12, 0.12 mg biotin, 2 mg folic acid, 85 mg nicotamide, 22 mg pantothenic acid, 120 mg manganese, 100 mg zinc, 40 mg iron, 20 mg copper, 1 mg iodine, 0.3 mg selenium.

Hematological Parameters:

- **Sample Collection and Analysis:**

At the end of the experimental period (42 days), nine birds per treatment (three birds per replicate) were randomly selected. Blood samples were collected from the wing vein using syringes and transferred into EDTA-containing anticoagulant tubes. The tubes were then transported to the laboratory in ice-cooled containers, labeled with the required information, and stored at −15 to −20 °C until hematological analyses were performed.

- **Red and White Blood Cell Counts:**

The total counts of red blood cells (RBC) and white blood cells (WBC) were performed using a modified Neubauer hemocytometer, and the cells were manually counted under a light microscope (40X). A differential white blood cell count (DWBC) was also conducted, and the absolute numbers of lymphocytes and heterophils were calculated. The heterophil/lymphocyte (H/L) ratio was determined as the ratio of heterophils to lymphocytes for each bird, following the method described by Onyishi *et al*., (2017).

- **Hemoglobin Concentration and Packed Cell Volume (PCV):**

Hemoglobin concentration was determined using a commercial chemical kit, with absorbance measured at 540 nm using a spectrophotometer. Packed cell volume (PCV) was measured using a microhematocrit reader and expressed as a percentage (Onyishi *et al*., 2017).

Carcass Traits:

After blood collection, the birds were slaughtered in accordance with animal welfare standards following an overnight fasting period. Live body weight was recorded immediately before slaughter, after which the birds were allowed to bleed, scalded, defeathered, and eviscerated. The dressed weight was recorded after removing feathers and inedible viscera.

The dressing percentage (%) was calculated, and the weights of the main carcass cuts (breast, thighs and drumsticks, and wings) were measured. Abdominal fat was separated, weighed, and expressed as a percentage of the dressed weight. Similarly, the internal organs (heart, liver, intestines, gizzard, and kidneys) were weighed and expressed as a percentage of live body weight.

Statistical Analysis:

Data were analyzed using one-way ANOVA according to a completely randomized design model, and the means were compared using Duncan's multiple range test to estimate significant differences among treatments at the 0.01 and 0.05 levels, employing the SPSS statistical software.

Results and Discussion:

Hematological Parameters:

Results presented in Table (2) indicated a significant effect ($P \leq 0.01$) of dietary *Moringa oleifera* leaf powder supplementation on most blood parameters in broiler chickens. Red blood cell (RBC) counts showed a gradual increase with higher levels of Moringa in the diet, reaching the highest value in T4 (2.80×10^6/mm³) compared to the control T1 (2.59×10^6/mm³). Similarly, hemoglobin concentration increased progressively with supplementation, with T4

the highest value (10.68 g/dl), while packed cell volume (PCV) was significantly elevated from 28.80% in T1 to 29.52% in T4. White blood cell (WBC) counts also increased significantly in T4 (22.04×10^3/mm³) relative to the control T1 (21.20×10^3/mm³), accompanied by a rise in lymphocyte percentage from 54.16% in T1 to 56.06% in T4. In contrast, heterophil percentage decreased significantly from 30.60% in T1 to 28.22% in T4. This shift was reflected in a reduction of the heterophil-to-lymphocyte (H/L) ratio from 0.56 in T1 to 0.50 in T4.

Table (2): Blood indicators of birds in the experimental groups

Hematological Parameters	Treatments*			
	T1	T2	T3	T4
Red Blood Cells (10^6/mm³)	2.59 ± 0.015^a	2.61 ± 0.017^a	2.67 ± 0.021^b	2.80 ± 0.022^c
Hemoglobin (g/dL)	10.12 ± 0.014^a	10.15 ± 0.016^b	10.27 ± 0.020^c	10.68 ± 0.023^d
Packed Cell Volume (PCV, %)	28.80 ± 0.023^a	28.83 ± 0.025^a	29.09 ± 0.028^b	29.52 ± 0.032^c
White Blood Cells (10^3/mm³)	21.20 ± 0.028^a	21.24 ± 0.030^a	21.41 ± 0.037^b	22.04 ± 0.041^c
Lymphocytes %	54.16 ± 0.22^a	54.81 ± 0.25^b	56.00 ± 0.35^c	56.06 ± 0.43^c
Heterophils %	30.60 ± 0.56^a	30.52 ± 0.43^b	29.86 ± 0.39^c	28.22 ± 0.35^c
H/L Ratio	0.56 ± 0.005^c	0.56 ± 0.005^c	0.53 ± 0.006^b	0.50 ± 0.007^a

[a, b, c, d]: Different horizontal letters indicate significant differences at 1% level. T1*: control (free of additives), T2, T3, and T4: T1+ 0.1%, 0.3%, and 0.6% *moringa* leaf powder, respectively.

The results of this study demonstrated a significant improvement in the hematological parameters of broilers fed diets supplemented with Moringa oleifera leaf powder, particularly at the 0.6% inclusion level. Both T3 and T4 groups exhibited marked increases in RBC count, hemoglobin concentration, and PCV compared to the control group, reflecting enhanced oxygen transport efficiency and

improved physiological status. These findings highlight the positive effects of bioactive compounds present in Moringa leaves, such as flavonoids, phenolics, and vitamins (B and C), in addition to their richness in essential minerals, especially iron, which confer antioxidant and hematopoietic properties (Kashyap *et al*., 2022).

Furthermore, the observed increase in lymphocyte percentage, accompanied by a decrease in heterophils and H/L ratio, indicates an enhanced immune response and reduced physiological stress. This suggests that the anti-inflammatory bioactive compounds, particularly phenolics, act as immunostimulants, thereby promoting antibody production and immune proteins (Vergara-Jimenez *et al*., 2017). Previous studies have also reported the role of quercetin in mitigating inflammatory processes by inhibiting nuclear factor kappa-beta (NF-κB) activity, consequently reducing downstream inflammatory events (Das *et al*., 2012).

Compared to previous studies, an increase in hemoglobin concentration was observed, while hematocrit values remained unaffected, and the H/L ratio decreased following the inclusion of three levels of *Moringa oleifera* leaf powder (0.1%, 0.2%, and 0.3%) in broiler diets (Hassan *et al*., 2016). In another study, supplementation with 0.5% and 0.75% *Moringa* leaf powder significantly improved hemoglobin levels, whereas increases in RBC count, PCV, WBC count, and lymphocyte percentage were not statistically significant (Kairalla *et al*., 2023).

Carcass Traits:

Results presented in Table (3) indicated that dietary inclusion of *Moringa oleifera* leaf powder significantly ($P \leq 0.05$) improved carcass Traits compared to the control group. Live body weight and dressed carcass weight gradually increased with higher levels of supplementation, with T4 (0.6%) recording the highest live weight (2729.86 g) and dressed weight (2041.64 g), followed by T3 (0.3%), while no significant differences were observed between T1 and T2. This was reflected in dressing percentage, which increased significantly to 74.79% in T4 compared to 71.57% in the control group.

Table (3): Carcass Traits of birds in the experimental groups

Carcass Traits	Treatments*			
	T1	T2	T3	T4
Live Body Weight (g)	2678.96 ± 10.24^{a}	2682.98 ± 10.26^{a}	2703.07 ± 10.33^{b}	2729.86 ± 10.44^{c}
Carcass Weight (g)	1917.29 ± 8.95^{a}	1923.05 ± 8.98^{a}	1982.91 ± 9.26^{b}	2041.64 ± 9.54^{c}
Dressing Percentage(%)	71.57 ± 0.27^{a}	71.68 ± 0.27^{a}	73.36 ± 0.28^{b}	74.79 ± 0.29^{c}
% of Carcass Weight				
Breast	28.03 ± 0.150^{a}	28.12 ± 0.158^{a}	28.70 ± 0.162^{b}	30.64 ± 0.172^{c}
Thigh + Drumstick	22.20 ± 0.355^{a}	22.27 ± 0.359^{a}	22.73 ± 0.365^{b}	24.27 ± 0.389^{c}
Wings	10.20 ± 0.257^{a}	10.23 ± 0.259^{a}	10.44 ± 0.267^{a}	11.15 ± 0.263^{b}
Abdominal Fat	1.97 ± 0.194^{b}	1.95 ± 0.190^{b}	1.79 ± 0.175^{b}	1.55 ± 0.155^{a}
% of Live Body Weight				
Heart	0.46 ± 0.015^{a}	0.46 ± 0.016^{a}	0.47 ± 0.021^{a}	0.47 ± 0.022^{a}
Liver	2.52 ± 0.032^{b}	2.50 ± 0.030^{b}	2.49 ± 0.026^{b}	2.45 ± 0.023^{a}
Intestine	4.13 ± 0.027^{a}	4.14 ± 0.037^{a}	4.16 ± 0.042a^{b}	4.19 ± 0.046^{b}
Gizzard	1.51 ± 0.023^{a}	1.52 ± 0.025^{a}	1.53 ± 0.029^{a}	1.57 ± 0.032^{b}
Kidney	0.40 ± 0.027^{a}	0.40 ± 0.026^{a}	0.39 ± 0.025^{a}	0.38 ± 0.022^{a}

$^{a, b, c, d}$: Different horizontal letters indicate significant differences at 5% level. T1*: control (free of additives), T2, T3, and T4: T1+ 0.1%, 0.3%, and 0.6% *moringa* leaf powder, respectively.

The percentages of major cuts (breast, thigh and drumstick) also increased significantly with higher levels of Moringa, with T4 exhibiting the highest values (30.64% and 24.27%, respectively), whereas T3 showed intermediate values, indicating a gradual response to supplementation. Wing percentage increased significantly only at the highest level (T4, 11.15%). Regarding fat deposition, abdominal fat decreased significantly with increasing Moringa levels, reaching 1.55% in T4 compared to 1.97% in the control group.

For internal organs, heart and kidney weights were not significantly affected by the treatments, whereas liver weight decreased significantly in T4 (2.45%) compared to the other treatments. Intestinal and gizzard weights showed slight but significant increases at T4 (4.19% and 1.57%, respectively).

The evaluation of carcass traits revealed a significant improvement in dressed weight and dressing percentage in broilers fed diets supplemented with *Moringa oleifera* leaf powder compared to the control group. Percentages of breast and thigh increased with higher supplementation levels, while abdominal fat decreased significantly. These effects may be attributed to the presence of substantial amounts of Crude fiber, amino acids, vitamins (β-carotene, B-complex, C), essential minerals, and highly digestible proteins in Moringa leaves (Sultana, 2020; Mahfuz and Piao, 2019), as well as bioactive antioxidant compounds such as ascorbic acid and tocopherols, which may be responsible for the observed increase in carcass yield (Hekmat *et al*., 2015). These compounds reduce physiological stress in birds while simultaneously enhancing protein absorption and digestion (Qwele *et al*., 2013; Saini *et al*., 2014).

Additionally, the significant reduction in abdominal fat indicates the ability of various bioactive compounds in Moringa leaves to regulate lipid metabolism. Phenolic compounds, along with flavonoids, play important roles in lipid regulation (Siasos *et al*., 2013). Moringa extracts have been shown to exhibit lipid-lowering activity by inhibiting both lipase and cholesterol esterase, demonstrating their potential in the prevention and management of hyperlipidemia (Toma *et al*., 2012).

The study results showed no significant differences among treatments in heart and kidney weights as percentages of live body weight, indicating that dietary inclusion of *Moringa oleifera* leaf powder had no adverse effects on the safety or function of these organs. However, a significant reduction in liver weight was observed at the highest supplementation level (0.6%), which may be attributed to decreased fat deposition in the liver due to the lipid-regulating effects of Moringa leaves (Siasos *et al*., 2013; Toma *et al*., 2012).

Intestinal weight showed a slight but significant increase with higher Moringa levels, reflecting improved functional activity. Previous studies have reported that Moringa leaf powder supplementation enhanced intestinal histomorphology by increasing villus height and the villus height to crypt depth ratio, positively affecting nutrient absorption efficiency (Khan *et al*., 2017). Additionally, gizzard percentage increased slightly but significantly at the highest Moringa level, suggesting enhanced grinding activity for fiber-rich feed, without negatively affecting overall performance or carcass traits.

The observed improvements in carcass traits can also be explained by the hematological changes resulting from the inclusion of *moringa* leaf powder. Birds fed moringa exhibited a significant increase in red blood cell count and hemoglobin concentration, reflecting greater efficiency in oxygen transport to tissues, which in turn contributes to enhanced muscle growth, higher carcass weight, and improved dressing percentage. Immune indicators also increased, such as white blood cell count,

accompanied by a reduction in the H/L ratio, indicating reduced stress and enhanced biological defenses in the birds. These effects are positively reflected in meat quality and in the increased proportions of breast and thigh cuts.

Compared to previous studies, carcass traits were not significantly affected by the inclusion of three levels of Moringa oleifera leaf powder (0.1%, 0.2%, and 0.3%) in broiler diets (Hassan *et al*., 2016), whereas supplementation with 3% Moringa leaf powder resulted in the most pronounced improvement in carcass traits (Alwaleed *et al*., 2020). In another study, inclusion of 0.5% and 0.75% Moringa leaf powder contributed to enhancements in carcass traits (Kairalla *et al*., 2023).

From an economic perspective, the inclusion of *moringa* leaf powder in broiler diets at levels of 0.1–0.6% demonstrates clear economic feasibility, although the study did not involve a detailed economic analysis. The results indicate direct economic benefits through improved meat quality and increased returns, as these small inclusion levels were sufficient to produce significant improvements in carcass weight, dressing percentage, and fat reduction, in addition to enhancing immunity and reducing the need for antibiotics, thereby contributing to lower treatment costs. Furthermore, the adoption of natural additives provides a marketing advantage in markets that prefer meat produced through healthy and sustainable practices. Thus, the improvement in performance achieved with low levels of *moringa* makes its use an economically effective natural additive, with the potential to reduce certain feeding costs or losses associated with poor carcass quality or weak immunity. In the same context, the reliance on natural additives grants the product a marketing advantage in markets that favor meat produced under healthy conditions.

Conclusions and Recommendations:

This study demonstrated that dietary supplementation with *Moringa oleifera* leaf powder positively affected hematological parameters and carcass traits in broiler chickens. Red and white blood cell counts, hemoglobin concentration, packed cell volume, and lymphocyte percentage were improved, accompanied by a reduction in the H/L ratio, indicating enhanced physiological status, immune response, and reduced stress. Carcass traits, including live weight, dressed weight, dressing percentage, and breast and thigh proportions, were also significantly enhanced, while abdominal fat was markedly reduced. No adverse effects were observed on heart and kidney weights, and slight improvements were noted in liver, intestine, and gizzard function. From an economic perspective, the results demonstrate direct economic feasibility through improved meat quality and increased returns with low levels of *moringa* inclusion, making it an economically effective natural additive. Moreover, it provides the product with a marketing advantage in markets that prefer meat produced through healthy practices. Based on these findings, it is recommended to use *Moringa oleifera* leaf powder as a natural feed additive in broiler diets at levels up to 0.6% to improve hematological parameters and carcass traits, taking advantage of its nutritional and bioactive properties without any negative effects on internal organs.

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تأثير التضمين الغذائي من مسحوق أوراق المورينجا (*Moringa oleifera*) على المؤشرات الدموية ومؤشرات الذبيحة لفروج اللحم

عمار محمود مصطفى[1*]

[1] قسم الإنتاج الحيواني، كلية الهندسة الزراعية، جامعة اللاذقية، سورية.

(*للمراسلة: عمار مصطفى، البريد الإلكتروني: ammarmostafa110@gmail.com)

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الملخّص

تُعد صناعة الدواجن من أكثر القطاعات الحيوانية تطوراً، إذ تعتمد على نظم تغذية وإدارة دقيقة تهدف إلى تحقيق أعلى كفاءة إنتاجية وجودة للّحم. وفي إطار الجهود الرامية إلى تعزيز الحالة الفسيولوجية والمناعية للطيور باستخدام مكونات طبيعية آمنة، برز الاهتمام بالإضافات النباتية ذات الخصائص الحيوية. تُعد المورينجا (Moringa oleifera) من النباتات الغنية بالبروتينات والمركبات المضادة للأكسدة والالتهابات، مما يجعلها خياراً واعداً في تغذية الدواجن. هدفت هذه الدراسة إلى تقييم تأثير إضافة مستويات مختلفة من مسحوق أوراق المورينجا إلى النظام الغذائي لفروج اللحم على بعض المؤشرات الدموية ومؤشرات الذبيحة. استخدم في التجربة 72 طائراً من هجين Ross 308 بعمر يوم واحد، ووزعت على أربع معاملات بواقع ثلاث مكررات لكل معاملة (6 طيور/مكرر). تلقت المجموعة الأولى T1 عليقة أساسية من دون إضافة، بينما غذيت المجموعات T2 و T3 و T4 على علائق مضاف إليها مسحوق أوراق المورينجا بنسبة 0.1%، 0.3%، و0.6% على التوالي، واستمرت التجربة 42 يوماً. أظهرت النتائج تحسناً معنوياً ($P\leq0.01$) في عدد خلايا الدم الحمراء وتركيز الهيموغلوبين وحجم الخلايا المعبأة، إلى جانب ارتفاع معنوي في عدد خلايا الدم البيضاء وانخفاض نسبة H/L. كما لوحظ تحسن ملحوظ ($P\leq0.05$) في نسبة التصافي وأوزان القطع الرئيسة (الصدر والفخذين) مع انخفاض ملحوظ في دهون البطن. تشير هذه النتائج إلى أن إضافة مسحوق أوراق المورينجا حتى مستوى 0.6% يمكن أن تسهم في تحسين مؤشرات الدم ومؤشرات الذبيحة، مما يجعلها إضافة طبيعية واعدة في علائق فروج اللحم.

الكلمات المفتاحية: فروج اللحم، مسحوق أوراق المورينجا، مؤشرات دموية، مؤشرات الذبيحة.