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Effect of feed dilution the with date kernels treated in different ways on some blood traits of broiler

[1]Zahra'a Razzaq Hussain, [2]Muhammad Jodi Shahid

[1,2] Animal Production Department, College of Agriculture and Marshes, University of Thi-Qar, Iraq.

Abstract

This experiment was conducted at the poultry field, Agricultural Research and Experiments Station, College of Agriculture and the Marshes, Thi Qar University, from 11/1/2021 to 12/12/2021, to determine the effect of diluting the feed with date kernels treated in different ways on some productive traits of broilers. A total of 270, one day, 40 gm chicks of Rose-308 were used. Chicks were randomly distributed to the five experimental treatments with three replicates (18 birds for each replicate), the diets were provided from the beginning of the second week until the end of the sixth week. The treatments were as follows: T1: Standard control diet (without dilution); T2: control diet diluted by 20% regular date seed pods for 7-42 days; T3: basal diet diluted with 20% date kernels, cooked for 7-42 days; T4: basal diet diluted with 20% vinegar-treated seed for 7-42 days; T5: basal diet diluted by 20% seed germinated for 7-42 days. The results indicated a significant increase on the cellular blood characteristics (Red Blood Cell Count, White Blood Cell Count, Hemoglobin concentration and the Packed Cell volume) in all dilution treatments with date kernel powder, whether treated or untreated. A significant increase on the concentration of albumin, globulin and total protein with a significant decrease in the concentration of glucose, cholesterol and triglycerides in the dilution treatments with date kernel powder compared to the control treatment.

Keywords: feed dilution, date kernels, blood traits, broiler.

I. INTRODUCTION

The diet dilution program is one of the important programs used in early food rationing, depends on adding diluting materials (high-fiber materials) to the diet such as wheat bran, oat husks, rice bran, feather powder, poultry droppings, date seed powder and sand, to reduce the level of energy and protein in the diet, to meet the requirements of maintenance only for a short period and at an early age in the life of broilers (Hassanabadi *et al*., 2006).

The possibility of using the date kernel as a low-cost alternative source in poultry diets, it was used as an eyeliner by grinding it and roasting it on the fire until it blackens. They say it makes the eyes wide and beautiful, it was kohl made of date kernels strengthens the eyelashes, it was used to treat atherosclerosis and heart and to break up stones, the existing oil can be used for human consumption (Ibrahim, 2012). It was used in the manufacture and production of coffee manufactured for human consumption and a product known as a cocoa substitute (Ghnimi *et al*., 2015).

Al-Zuhairi (2019) concluded that the use of date pomace in reducing broiler diets was 10,20,30% during the starter period, because there are no negative effects of food rationing, no significant differences were observed in the rate of live body

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bleeding, cumulative weight gain, cumulative feed consumption, it was also noted that the productivity index improved, and the percentage of losses decreased, feed dilution in the early period of the bird's life did not affect the weights of the main and secondary cuts, the relative weights of the giblet. Diluting the feed with date seed powder by 40% at the age of 7-14 days led to a significant decrease in the percentage of deaths with a significant increase in the productivity index values (Al-Zamili *et al*., 2018). Al-Gharawi *et al*. (2018) showed that when feeding broilers on fodder diluted with dried green bean husks powder at a rate of 15%, it significantly reduced the percentage of quantitative deaths with a significant increase in the productivity index values, Al-Jiashi (2018) noticed a significant decrease in the percentage of quantitative losses with a significant increase in the values of the production index when diluting the starter diet with date kernel powder by 20% compared to the control diet.The current study aims at the effect of feed dilution with date kernels processed by different ways on some blood traits of broiler chickens.

II. MATERIALS AND METHODS

This experiment was conducted at the poultry field of the Agricultural Research and Experiments Station, College of Agriculture and the Marshes, Thi Qar University, from 11/1/2021 to 12/12/2021. A total of 270, one day, 40 gm weight, broiler Rose 308 chicks were used, it was brought from Al-Anwar hatchery at Al-Kifl, Babil Governorate, one third of the hall was reserved and the chicks were reared in cages, the area of one cage (1.5×1.5 meters) with sawdust flooring, all birds were fed on the starter diet until the end of the week, then the chicks were randomly distributed to the five experimental treatments with three replications (18 birds for each repeat). The dilution diets were provided from the beginning of the second week until the end of the sixth week. The treatments were as follows:

T1: Standard control diet (without dilution).

T2: control diet diluted by 20% regular date seed pods for 7-45 days.

T3: basal diet diluted with 20% date kernels, cooked for 7-45 days.

T4: basal diet diluted with 20% vinegar-treated seed for 7-45 days.

T5: basal diet diluted by 20% seed germinated for 7-45 days.

Blood traits

Cellular traits

Red Blood Cell (RBC), White Blood Cell (WBC), Hemoglobin concentration (Hb), Packed Cell Volume (PCV).

Biochemical traits

Concentration of glucose, cholesterol, triglyceride, albumin, globulin and total protein.

Statistical analysis:

Complete Random Design (CRD) was used to study the effect of different treatments on the studied traits, significant differences between means were compared with Duncan (1955) multiple range test under significance level of 0.05 and 0.01. The program SPSS (2012) was used in the statistical analysis.

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III. RESULTS AND DISCUSSION

Cellular blood traits

Table (1) indicates the effect of diluting the feed with date kernels treated in different ways on red blood cell count (RBC), white blood cell count (WBC), hemoglobin concentration (Hb) and pressurized blood cell volume (PCV) in the blood of broilers. Diluting feed with date kernel powder has a significant effect on blood cellular characteristics, it was noticed that there was a significant increase (P≤0.05) in the number of red and white blood cells in addition to the hemoglobin concentration with T5 treatment compared to T4 treatment, which showed a significant increase (P≤0.05) compared to treatment T2, which is significantly superior to treatment T3, which showed a significant increase (P≤0.05) compared to the control treatment. The average red blood cell count was 2.16, 2.30, 2.23, 2.40 and 2.49 x 106 cells/ml of blood, the average white blood cell count was 26.12, 26.53, 26.31, 27.23 and 27.99 cells x 103/ml of blood, as for the hemoglobin concentration, it was 12.46, 12.80, 12.58, 13.30 and 13.75 g/100 ml of blood for the T1, T2, T3, T4 and T5 treatments, respectively.

As for the Packed Cells Volume (PCV), there was a significant increase (P≤0.05) in the T5 treatment compared to the control and T3 treatments, there are no significant differences between treatments T1, T2 and T3 and treatments T2, T3 and T4, and treatments T2, T4 and T5. The Packed Cells Volume (PCV) was 27.15, 28.02, 27.69, 28.30 and 28.77% for T1, T2, T3, T4 and T5 treatments, respectively.

Table (1) Effect of dilution of feed with date kernels treated by different methods on Red Blood Cell count (RBC), White Blood Cell count (WBC), hemoglobin concentration (Hb) and Packed Cells Volume (PCV)in broiler blood (mean ± error) standard).

Treatments	Red blood cell (RBC) count (cell x 10^6/ml blood)	White blood cell count (WBC) (cell x 10^3/ml blood)	Hemoglobin concentration (Hb) (gm/100ml blood)	Packed cell volume (PCV) (%)
T1	0.029±2.16 e	0.069±26.12 e	0.040±12.46 e	٠,٠٥٥±27.15 c
T2	0.008±3.20 c	0.036±26.53 c	0.040±12.80 c	٠,٠٣٤±28.02 abc
T3	0.008±2.23 d	0.017±26.31 d	0.026±12.58 d	٠,٦٤٥±27.69 bc
T4	0.008±2.40 b	0.032±27.23 b	٠,٠٢٩±13.30 b	٠,٠٣٥±28.30 ab
T5	0.008±2.49 a	0.092±27.99 a	٠,٠٣٢±13.75 a	٠,٠٥١±28.77 a
Sig.	*	*	*	*

Diluting the feed with date kernel powder led to a significant increase on the number of red and white blood cells, hemoglobin concentration and packed cell volume compared to the control treatment, this may be due to a disturbance in the metabolic process, as a result of the continuation of the feeding process and freely, in addition to the high growth rate, led to the speed of metabolism, forcing the body to increase the number of blood cells to meet the body's need for oxygen (Canan and Emsen, 2012).

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Biochemical traits of blood

The concentration of glucose, cholesterol and triglycerides

Table (2) shows the effect of diluting the feed with date kernels treated with different methods on the concentration of glucose, cholesterol and triglycerides in the blood serum of broilers. Diluting the feed with date kernel powder led to a significant decrease (P≤0.05) in the glucose concentration in the blood serum of broilers under T5 treatment, at a rate of 181.28 mg/100 ml of blood, compared to T4 treatment at 189.69 mg/100 ml of blood, decreased significantly (P≤0.05) at the expense of treatment T2 at a rate of 200.72 mg 100 ml blood, which showed a significant decrease (P≤0.05) compared to T3 treatment at a rate of 212.00 mg/100 ml of blood, significantly lower (P≤0.05) compared to the control treatment, which averaged 221.99 mg/100 blood.

Also, treatment T5 showed a significant decrease (P≤0.05) in cholesterol concentration at a rate of 112.52 mg/100 ml of blood compared to treatment T4 at a rate of 120.00 mg/100 ml of blood, which showed a significant decrease compared to treatments T1, T2 and T3 with averages of 131.31, 128.86 and 129.51 mg/100 ml blood, respectively, the treatments T1, T2 and T3 did not show any significant differences between them.

The results in the same table also indicate a significant decrease (P≤0.05) with T5 treatment in triglyceride concentration, with an average of 127.36 mg/100 ml blood, compared to T4 treatment with an average of 131.16 mg/100 blood, which showed a significant decrease (P≤0.05) compared to the two treatments T2 and T3, with an average of 137.94 and 139.04 mg/100 ml blood, did not differ from each other significantly, but decreased significantly (P≤0.05) compared to the control treatment, with an average of 141.60 mg/100 ml blood.

Dilution of the feed with date kernel powder led to a significant decrease in the concentration of glucose, cholesterol and triglycerides in the blood serum of broilers compared to the control treatment. The reason for this may be attributed to the fact that diluting the feed with date seed powder is a stressful factor, which makes the birds dependent on the energy elements in their bodies to meet their necessary and necessary needs for perpetuation and growth, destroy some of these components to compensate for the low energy in its food and then its low levels in the blood (Silas *et al*., 2014).

Table (2) Effect of diluting feed with date kernels treated with different methods on the concentration of glucose, cholesterol and triglycerides in the serum of broilers (mean ± standard error).

Treatments	Glucose (mg/100ml)	Cholesterol (mg/100ml)	Triglyceride (mg/100ml)
T1	1.75±221.99 a	0.40±131.31 a	0.97±141.60 a
T2	1.18±200.72 c	0.67±128.86 a	0.08±137.94 b
T3	1.83±212.00 b	0.62±129.51 a	0.25±139.04 b
T4	0.89±189.69 d	1.40±120.00 b	0.67±131.16 c
T5	0.91±181.28 e	1.93±112.52 c	0.41±127.36 d
Sig.	*	*	*

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The concentration of albumin, globulin and total protein

Table (3) shows the effect of diluting the feed with date kernels treated with different methods on the concentration of albumin, globulin and total protein in the blood serum of broilers. Dilution of feed with date kernel powder, whether treated or untreated, had a significant effect on the concentration of albumin, globulin and total protein compared to the control treatment. Feed dilution of with cultured date kernel powder (T5) led to a significant (P≤0.05) increase in albumin concentration, at an average of 1.55 g/100 ml of blood, comparison of feed dilution with date kernel powder treated with vinegar (T4), which showed a significant increase (P≤0.05) at a rate of 1.48 g/100 blood compared to the two treatments T2 and T3, at a rate of 1.43 and 1.39 g/100 ml of blood, which increased significantly (P≤0.05) compared to the control treatment, with an average of 1.31 g/100 ml of blood.

In globulin concentration, it was also observed that treatment T5 showed a significant increase (P≤0.05) compared to treatment T4, which led to a significant increase (P≤0.05) compared to treatment T2, which was significantly superior at the expense of the two treatments, control and treatment T3, which did not differ between them significantly. The globulin concentrations were 1.78, 1.88, 1.81, 2.05 and 2.18 g/100 blood for T1, T2, T3, T4 and T5 treatments, respectively.

As for the total protein concentration, it was observed that treatment T5 showed a significant increase (P≤0.05) at a rate of 3.73 g / 100 ml blood compared to treatment T4 at a rate of 3.53 g / 100 ml blood, which was significantly superior (P≤ 0.05) at the expense of treatment T2 at a rate of 3.32 g /100 blood, which showed a significant increase compared to the T3 treatment at a rate of 3.20 g/100 blood, which was significantly (P≤0.05) superior to the control treatment with an average of 3.09 g/100 blood.

The dilution of feed with date kernel powder led to a significant increase in the concentration of albumin, globulin and total protein compared to the control treatment. Canan and Emsen (2012) indicated that it may be due to the disturbance of the metabolic process as a result of the continuation of the feeding process in a free manner, as well as the high growth rate, which led to the speed of metabolism, forcing the body to increase the number of blood cells to meet the body's need for oxygen.

Table (3) Effect of diluting feed with date kernels treated with different methods on the concentration of albumin, globulin and total protein in the serum of broilers (mean ± standard error).

Treatments	Albumin (gm/100ml)	Globulin (gm/100ml)	Total protein (gm/100ml)
T1	0.020±1.31 d	0.008±1.78 d	0.003±3.09 e
T2	0.011±1.43 c	0.023±1.88 c	0.017±3.32 c
T3	0.020±1.39 c	0.008±1.81 d	0.020±3.20 d
T4	0.026±1.48 b	0.020±2.05 b	0.032±3.53 b
T5	0.022±1.55 a	0.025±2.18 a	0.044±3.73 a
Sig.	*	*	*

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