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RESEARCH ARTICLE

EFFECT OF ADDING DIFFERENT LEVELS OF NEEM (*AZADIRACHTAINDICA*) SEEDS POWDER AND AQUEOUS EXTRACT ON PRODUCTION PERFORMANCE OF THE BROILER CHICKENS

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ABSTRACT

The study was conducted at the animal farm, Department of Animal production, College of Agriculture - University of Tikrit, included field experimentation which conducted during 28/3/2013 to 9/5/2013 The present study was conducted to explore the effect of different levels of Neem (*Azadirachtaindica*) Seeds powder and aqueous extract on Performance of production of the Broiler Chickens , the study include 525 chicks of broiler from un sexed hybrids (Hubbard), day one-old from Samarra's Salahaldin province, The chicks were divided randomly at the age of 2 week to seven treated groups each group has three replicates and each replicate included 25 chicks were treated as follows : T1. Control without any addition, T2.T3.T4. Supplemented with powdered seeds of the Neem to diet at ratios of 1.5, 2 and 2.5 g / kg of diet respectively ,T5.T6.T7. supplemented extract of the seeds Neem to drinking water by 20.30 and 40 ml / liter of water respectively. The results of the study showed that: A significant ($p < 0.05$) for aqueous extract treatments of Neem seed and especially Add 40 ml / liter of drinking water in the rate of body weight (g)compared to the control groupwhilst not recorded any significant differences in theincrease weight rate andfeed conversation rate efficiency.

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INTRODUCTION

The plants of the oldest friends of the human race, they do not only provide food, shelter and even serve humanity through their ability to treat various diseases, and that the practice of herbal medicine dates back to the very early period of human history, and there are plenty of evidence the use of herbs in the treatment of diseases in all old Alsumaria, Egyptian and Chinese civilizations and even Greek and Romanian civilizations (Cardozo *et al*., 2004), and to its role as a painkiller and stimulating to the characteristics of digestion and absorption and to promote the synthesis of the production of bile acids in the liver, and increase the activity of digestive enzymes (Frankic *et al*., 2009; Lavinia *et al*., 2009). Medicinal plants and herbs have been used in the poultry industry because of their direct and indirect impact on the productivity performance of the bird, and as an alternative to antibiotics and incentives for growth (Cowan, 1999; Kamel, 2001), as the vast majority of them characterized as effective anti-bacteria, fungi, and a catalyst for the growth of through its role in stimulating the secretion increase digestive enzymes which lead to improving the digestion of nutrients, and improve production and give immunity to the bird (Tekeli *et al*., 2007). To plant neem Azadirachtaindica great biological importance because it contains many of the active compounds and seeds rich in fatty acids accounting for almost 50% of the seed weight, and is considered as an antioxidant through reduced enzyme Lipooxygenase responsible for enzymatic oxidation in the process of fat Lipid Peroxidation (Rao *et al*., 1998). Orf level of antioxidants and detoxification (Arivazhagan *et al*., 2000). The good food for the animals, especially fruits because they contain a large proportion of vitamin C as well as other materials, as indicated (Sadekar *et al*., 1998)

The use of 10% of the aqueous extract of neem leaf has a role as an antidote Vairose and protection against smallpox. And that this study was conducted to see the effect of the use of the seeds of the neem plant as an addition to feed or water to extract drinking water in the productive qualities of broiler chickens.

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MATERIALS AND METHODS

The study was conducted at the animal farm, Department of Animal production, College of Agriculture - University of Tikrit,included field experimentation which conducted during 28/3/2013 to 9/5/2013.The study include 525 chicks of broiler from un sexed hybrids (Hubbard), day one-old from Samarra's Salahaldin province, The chicks were divided randomly at the age of 2 week to seven treated groups each group has three replicates and each replicate included 25 chicks were treated as follows : T1. Control without any addition, T2, T3, T4. supplemented with powdered seeds of the Neem to diet at ratios of 1.5, 2 and 2.5 g / kg of diet respectivelyT5, T6, T7. supplemented extract of the seeds Neem to drinking water by 20 , 30 and 40 ml / liter of water respectively. It has been providing feedfor the birds freely and fed the birds on a ration (Table. 1) The experiment included a study of the following characteristics: body weight, weight gain, feed consumption feed conversion efficiency and mortality. Data were subjected to an ANOVA using the General Linear Models (GLM) procedures of SAS (2010). Significant treatment means were separated by using the multiple range test of Duncan (Duncan, 1955).

This study was conducted in the poultry field of the Livestock Department in the College of Agriculture / University of Tikrit for the period from 03/14/2015 up to 04/18/2015. 525 chicks were breeding of chicken meat from non-naturalized hybrids (Hubbard) day-old. It has been raising chicks in cages ground.

RESULTS AND DISCUSSION

It is shown in Table (2) to add different levels of powder and extract the seeds of neem leaf to feed or drinking water were not significantly affect the rate of live body weight of the broiler chickens at the second week of the age of the bird while noting the emergence outweigh the significant ($P < 0.05$) at week the third of the age of the bird for the fifth treatment (20 mL aqueous extract of the seeds of neem leaf / L), seventh (40 mL aqueous extract of neem seed / liter plant) as the percentage grades (762.66) g and (768.33) g, respectively, compared to the third treatment (2 g feed the seeds of the neem leaf powder / kg), which recorded the lowest rate of weight vivo, as was (707.00) g followed by the first treatment (control), which recorded (725.66) g. In the fourth week of the age of the bird not there registered any significant differences between experimental treatments all at the fifth week outperformed significantly ($P < 0.05$) each from the fourth treatment (2.5 g feed powder seeds of neem leaf / kg) and fifth (20 mL aqueous extract of the seeds of neem leaf / liter) and seventh (40 mL aqueous extract of neem seed / liter plant) as the percentage grades (1691.67) g, (1699.33) g and (1691.67) g, respectively, compared to the third treatment (2 g feed powder seeds of neem leaf / kg), which recorded the lowest rate of weight vivo as it was (1553.67) g followed by the first treatment (control), which recorded (1560.33) g, and at the sixth week continued to exceed each of the seventh treatment (40 mL aqueous extract of neem seed / L) and the fifth-treatment plant (20 ml Abstract aqueous neem seed / liter plant) was significantly ($P < 0.05$) to record the highest rate of body weight neighborhood (g) as it was (2238.33 and 2220.0) g respectively, while the first transaction recorded (control) is the lowest rate for the weight of the neighborhood, which reached the body (2040.33) g followed by the third treatment (2 g powder feed plant the seeds of the neem / kg), which recorded (2076.00) g.

The significantly increased ($P < 0.05$) in the rate of live body weight at the age of 6 weeks and in most phases of the experiment may be due to the ability of this plant to increase the efficiency of utilization of the article of food through its effect on the digestive enzymes in the digestive system or it may be due to the effectiveness of this plant in inhibition of the central nervous system, leading to reduced animal movement rate and thus a decrease in the amount of spent energy occurs as previously pointed out all of (Singh *et al*, 1980; Singh *et al*, 1987) to the possibility of the use of aqueous extract and alcohol to plant neem in reducing the effectiveness of laboratory rats and reduce its activity.

Results can be seen from Table (3) the lack of statistically significant differences in the rate of weight gain (g weekly) for broiler chickens at the age (2-3, 3-4, 4-5 and 5-6 week), and through the total term between (2- 6 weeks) the emergence outweigh the moral were observed ($P < 0.05$) for all treatments, seventh treatment recorded (40 ml / liter aqueous extract of the seeds of neem leaf) the highest rate of increase gravimetric total (1860.00 g), followed by fifth-treatment (20 ml / liter aqueous extract of seeds Neem leaf) and recorded (1836.67 g) and then the second treatment came (1.5 g / kg feed the seeds of the plant powder neem) and recorded (1805.0 g), followed by the fourth treatment (2.5 g / kg feed powder seeds of neem leaf) and recorded (1760.00 g), followed by treatment the first (control) (1750.67 g) were followed by the sixth treatment (30 ml / liter aqueous extract of the seeds of neem leaf) and recorded (1748.33 g) compared to the third treatment (2 g / kg feed seed powder plant neem) has recorded the lowest rate of increase grains College (1717.30 g). These results are likely affected by it at the rate of the weekly feed consumption (Table 4) as it noticed the presence of a fluctuation in the feed consumption rate is almost in line with the weight weekly increase. Results of the study agreed with Zanu *et al*. (2011) who did not observe significant differences in the rate of fed weekly increase the weight of the broiler chickens diets added her neem plant. The study differed with Chakeravarty and Prasad (1991); Tipu *et al*. (2002) who observed a significant rise in the rate of weight gain in broiler chickens fed on diets

The Table indicates (4) that there is no significant difference statistically in the weekly feed consumption rate of chicken meat from which the powder and extract the seeds of the plant add neem to the ration and to drinking water in comparison with control at ages (3 and 4) weeks and at the age of the study treatments (5) weeks the seeds of the plant powder neemtreatments recorded in the ration (the second, third and fourth) a significant decrease ($P < 0.05$) in feed consumption rate stood at (787.00, 801.46 and 793.60) g respectively, while the aqueous extract of the seeds of neem leaf treatments (fifth and sixth recorded and seventh) was significantly higher ($P < 0.05$) in feed consumption rate stood at (1004.60, 944.40 and 978.86) g respectively gobble up the first treatment (control) and recorded (941.86) g.

Table 1. Composition of experimental ration

Grower 22 – 42 days of age	Starter 1 – 21 days of age	Ingredients (%)
65.1	56.1	Yellow corn
21	30	Soybean meal (44% protein)
8	10	Protein concentaverage(45% protein)
4	2	Sunflower oil
1.0	1.0	limestone
0.3	0.3	Salt
0.15	0.15	Methionine
0.15	0.15	Lysine
0.3	0.3	A mixture ofvitamins and minerals*
%100	%100	Total
	Calculated chemical structure**(%)	
3009	3728.4	ME, Kcal / Kg feed
18.37	22.46	Crude protein
0.73	0.95	Lysine
0.24	0.34	Methionine
2.90	3.33	Crude fiber
0.03	0.04	Calcium
0.23	0.23	Available phosphorus

* Contains 1 kg of a mixture of vitamins and minerals to vit.k4000000IU. And vit.D32000000IU and vit.E acetate 15000mg and vit.B1 (Thiamine mouoitrate) 500 and vit.B2 1500MG and hydyochloide) 1000mg pyridoxine) vit.B6 and d-pantothenic acid 3333mg and vit.k3 (menadione) 667mg and vit.B12 5mg and folic acid 300mg and choline chloride 40000mg and Iron (ferrous carbonate) 30000mg and Manganese (manganese oxide) 33333mg and Copper (cupric sulphate) 3333mg and Selenium (sodium selenite) 100mg and Zinc (zinc oxide) 25000mg and DI-Methionine 350mg and Anti-oxidant Termax Dry

** Chemical structure was calculated according to the analysis of diet material found in NRC (1994).

Table 2. The effect of adding different levels of powder and extract the seeds of the neem plant to the ration and water on mean body weight (g)

Treatments							age (week)
The seventh treatment	The sixth treatment	The fifth treatment	The fourth treatment	The third treatment	The second treatment	Control treatment	
2.4 ± 378.33 a	**5.7 ± 361.33** a	**14.4 ± 383.33** a	**2.3 ± 370.66** a	**3.4 ± 349.66** a	**13.6 ± 371.00** a	**2.0 ± 363.66** a	**2**
6.3 ± 768.33 a	**13.6 ± 739.00** ab	**22.3 ± 762.66** a	**14.8 ± 739.33** ab	**7.9 ± 707.00** b	**11.8 ± 749.66** ab	**6.3 ± 725.66** ab	**3**
6.6 ± 1140.00 a	**20.2 ± 1126.00** a	**12.5 ± 1209.33** a	**11.7 ± 1185.00** a	**46.4 ± 1144.00** a	**36.1 ± 1165.67** a	**3.5 ± 1182.00** a	**4**
19.8 ± 1691.67 a	**36.5 ± 1636.00** ab	**17.0 ± 1699.33** a	**19.9 ± 1691.67** a	**74.5 ± 1553.67** b	**10.2 ± 1660.00** ab	**32.3 ± 1560.33** b	**5**
29.2 ± 2238.33 a	**65.5 ± 2109.67** abc	**56.3 ± 2220.0** ab	**60.9 ± 2130.67** abc	**31.6 ± 2067.00** bc	**48.3 ± 2176.00** abc	**18.3 ± 2040.33** c	**6**

- Control treatment: free of any addition.
- The second, the third and fourth treatments : add the seeds of the neem leaf powder to the ration by (1.5, 2, 2.5 g / kg feed) respectively.
- The fifth, sixth and seventh treatments : add aqueous extract of the seeds of the neem plant to natural drinking water by (20,30,40 ml / L), respectively.

Table 3. The effect of adding different levels of powder and extract the seeds of the neem plant to the ration and water on weekly weight gain (g)

Treatments							age (week)
The seventh treatment	The sixth treatment	The fifth treatment	The fourth treatment	The third treatment	The second treatment	Control treatment	
8.1 ± 390.0 a	**13.4 ± 377.66** a	**8.7 ± 379.33** a	**12.7 ± 368.66** a	**4.4 ± 357.33** a	**11.4 ± 378.66** a	**7.5 ± 362.00** a	**3-2**
9.5 ± 371.66 a	**19.6 ± 387.33** a	**17.4 ± 446.66** a	**11.7 ± 445.66** a	**54.3 ± 437.00** a	**24.8 ± 416.00** a	**9.7 ± 456.33** a	**4-3**
25.3 ± 551.66 a	**55.4 ± 510.00** a	**28.6 ± 490.00** a	**31.7 ± 506.66** a	**113.3 ± 409.66** a	**30.8 ± 494.33** a	**28.8 ± 378.33** a	**5-4**
10.0 ± 546.66 a	**60.5 ± 473.66** a	**70.28 ± 520.66** a	**58.6 ± 439.00** a	**78.1 ± 513.33** a	**40.1 ± 516.00** a	**15.3 ± 554.00** a	**6-5**
28.91 ±1860.00 a	**62.4 ± 1748.33** a	**44.2 ± 1836.67** a	**62.6 ± 1760.00** a	**29.38 ±1717.33** a	**42.6 ± 1805.0** a	**23.3 ± 1750.67** a	**6-2**

- Control treatment: free of any addition.
- The second, the third and fourth treatments : add the seeds of the neem leaf powder to the ration by (1.5, 2, 2.5 g / kg feed) respectively.
- The fifth, sixth and seventh treatments : add aqueous extract of the seeds of the neem plant to natural drinking water by (20,30,40 ml / L), respectively.

Table 4. The effect of adding different levels of powder and extract the seeds of the neem plant to the ration and water on weekly feed intake (g)

Treatments							age (week)
The seventh treatment	The sixth treatment	The fifth treatment	The fourth treatment	The third treatment	The second treatment	Control treatment	
9.7 ± 505.53 a	**9.8 ± 504.26** a	**13.8 ± 495.86** a	**19.3 ± 496.20** a	**7.3 ± 472.46** a	**15.0 ± 492.60** a	**4.4 ± 483.65** a	**3-2**
13.4 ± 653.86 a	**37.6 ± 619.40** a	**40.7 ± 679.60** a	**62.0 ± 671.93** a	**15.3 ± 643.46** a	**37.2 ± 657.80** a	**31.2 ± 644.33** a	**4-3**
13.4 ± 978.86 a	**37.6 ± 944.40** a	**40.7 ± 1004.60** a	**50.3 ± 793.60** b	**49.6 ± 801.46** b	**22.6 ± 787.00** b	**56.6 ± 941.86** a	**5-4**
31.9 ± 1073.60 c	**14.7 ± 1136.73** bc	**16.0 ± 1125.97** bc	**24.9 ± 1146.67** b	**7.0 ± 1140.80** b	**8.4 ± 1128.60** bc	**22.4 ± 1226.40** a	**6-5**
34.8 ± 3211.87 ab	**56.9 ± 3204.30** ab	**59.6 ± 3306.03** a	**74.9 ± 3108.40** b	**42.8 ± 3058.20** b	**49.1 ± 3066.07** b	**50.4 ± 3296.25** a	**6-2**

- Control treatment: free of any addition.
- The second, the third and fourth treatments : add the seeds of the neem leaf powder to the ration by (1.5, 2, 2.5 g / kg feed) respectively.
- The fifth, sixth and seventh treatments : add aqueous extract of the seeds of the neem plant to natural drinking water by (20,30,40 ml / L), respectively.

Table 5. The effect of adding different levels of powder and extract the seeds of the neem plant to the ration and water on the feed conversion ratio (g feed/ g gain)

Treatments							age (week)
The seventh treatment	The sixth treatment	The fifth treatment	The fourth treatment	The third treatment	The second treatment	Control treatment	
0.02 ± 1.29 a	**0.03 ± 1.33** a	**0.01 ± 1.30** a	**0.02 ± 1.34** a	**0.01 ± 1.32** a	**0.00 ± 1.30** a	**0.03 ± 1.33** a	**3-2**
0.08 ± 1.76 a	**0.12 ± 1.60** a	**0.07 ± 1.52** a	**0.16 ± 1.51** a	**0.15 ± 1.51** a	**0.17 ± 1.60** a	**0.05 ± 1.41** a	**4-3**
0.06 ± 1.78 b	**0.19 ± 1.85** b	**0.09 ± 2.05** ab	**0.01 ± 1.56** b	**0.38 ± 1.95** ab	**0.12 ± 1.60** b	**0.11 ± 2.49** a	**5-4**
0.09 ± 1.96 a	**0.33 ± 2.48** a	**0.24 ± 2.22** a	**0.37 ± 2.70** a	**0.34 ± 2.32** a	**0.19 ± 2.21** a	**0.02 ± 2.21** a	**6-5**
0.03 ± 1.72 a	**0.09 ± 1.83** a	**0.07 ± 1.80** a	**0.07 ± 1.77** a	**0.04 ± 1.78** a	**0.06 ± 1.70** a	**0.00 ± 1.88** a	**6-2**

- Control treatment: free of any addition.
- The second, the third and fourth treatments : add the seeds of the neem leaf powder to the ration by (1.5, 2, 2.5 g / kg feed) respectively.
- The fifth, sixth and seventh treatments : add aqueous extract of the seeds of the neem plant to natural drinking water by (20,30,40 ml / L), respectively.

But at the age of 6 weeks we note the superiority of the first treatment (control) was significantly (P <0.05) on experimental treatments (powder and extract the seeds of neem leaf) to record the highest feed consumption rate stood at (1226.40) g while seventh-treatment recorded (40 mL aqueous extract of seeds Neem / liter plant) lower feed consumption rate stood at (1073.60) g, and during college time between (2-6) Week notes the emergence outweigh the significant (P <0.05) for the fifth treatment and the first, which added to its water extract of the seeds of the neem plant and the first (control) without any addition, where fifth-treatment recorded (20 mL aqueous extract of the seeds of neem leaf / L) higher consumption of total feed rate stood at (3306.03) g, followed by the first treatment (control) and recorded (3296.25) g while the second transaction recorded (1.5 g feed powder the seeds of the neem plant / kg) and third (2 g powder feed plant the seeds of the neem / kg), the lowest rate for the total feed consumption reached (3066.07 and 3058.20) g respectively. The addition powder seeds of neem leaf to feed a negative impact on feed consumption rate when compared to both the control treatment and treatments in addition aqueous extract (T7, T6, T5) is likely to be a decline in feed consumption due to the increased concentration of glucose in the blood has indicated Sturkie 1986 to the possibility of considering the level of glucose from the main determinants for feed in poultry.

The table indicates (5) also to the absence of significant differences (P <0.05) between the treatments for two terms age (3 and 4) weeks in feed conversion weekly broiler chickens efficiency rate and at the age of 5 weeks seed powder plant transactions recorded neem significant decrease (P <0.05) in comparison with control as the second transaction recorded (1.5 g feed powder seeds of neem leaf / kg) and the fourth treatment (2.5 g / kg feed seed powder plant neem) the best value for the efficiency of feed conversion at the age of (5 weeks) as the percentage (1.60) and (1.56), respectively, compared with control group which recorded (2.49) while it was not significant differences between the other treatments, and at the age periods (6) and (2-6) a week did not record any significant differences between experimental treatments. Through the positive results that have been obtained through the results of the study in all productive qualities and which dates back to the plant's role as an anti-bacterial (Elangovan *et al*., 1996) and fungi (Kale *et al*., 2003) as well as its role

enhanced growth by increasing the readiness of nutrients for the body by increasing the activity of digestive enzymes to allow for the body of the bird maximum of feed intake advantage pointed Kale *et al*. (2003) that the fruits of neem leaf containing a large proportion of vitamin C and E and which enhances the digestion processes as between the Secretary (2011) that the neem plant is good food for the animals, especially the fruits that contain a large percentage of vitamin C as well as other materials such as carbohydrates - mineral salts - proteins - fat - calcium and others. He also noted Onyimonyi *et al*. (2009) that the active ingredients from the seeds of the neem's ability to create suitable for the intestines to release and absorb nutrients in the digestive tract needed to promote growth through the promotion of digestion and absorption that occurs in the intestinal environment. Results of the study agreed with the findings of the each of the Durrani *et al*. (2008) and Wankar *et al*. (2009) and Onyimonyi *et al*. (2009) and Zanu *et al*. (2011) and Bonsu*et al*. (2012) and Obikaonu *et al*. (2012) and Obun *et al*. (2013) the existence of significant differences when adding the plant powder neem to the bush or the use of aqueous extract of the plant while not agree with the findings of the both and Landy *et al*. (2011) and Adeyemo and Akanmu (2012) and Nnenna *et al* (2013) that there were no significant differences for the use of plant Neem in all the qualities of productivity.

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