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PERFORMANCE AND SOME PHYSIOLOGICAL INDICES OF BROILER CHICKS FED UREA-CONTAINING GROWER DIETS

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ABSTRACT

The present study was undertaken to investigate the effects of feeding urea-containing grower diets on growth performance, nutrient digestibility, carcass traits and some blood parameters of broiler chicks. Three hundred sixty 3-wk-old unsexed (Cobb-500) broiler chicks were randomly divided into five equal treatments; each consisted of 6 equal replications, and kept in conventional wire-floored growing batteries. Five experimental diets [of similar crude protein (18.9%) and metabolizable energy (about 3136 kcal/kg) contents] having five graded levels of urea (0.00, 0.345, 0.69, 1.035 and 1.38%) were formulated and used from 3 to 6 weeks of age. All birds had free access to feed and water and were reared under similar managerial and environmental conditions. The response of chicks to feeding the urea-containing diets included growth performance [in terms of feed intake (FI), live body weight (LBW), body weight gain (BWG), feed conversion (FC), economic efficiency of growth (EEG), mortality rate, nutrient digestibility [including dry matter (DM), organic matter (OM), crude protein (CP), ether extract (EE), crude fiber (CF) and nitrogen-free extract, and ash and nitrogen retention], certain carcass traits, and some blood parameters.

The obtained results could be summarized as follows: There were significant depressions in final LBW, BWG and FI of birds fed the urea-containing diets as compared to their control group; however, FC and EEG were not significantly affected. With the exception of slight reductions in crude protein digestibility and rate of nitrogen retention in birds fed the 1.38% urea in their diet while the other experimental groups (fed diets containing 0.345, 0.69 and 1.035% urea) exhibited means of digestibility for DM, OM, EE, CF and NFE as well as ash retention comparable to those of the control birds. Feeding the urea-containing diets had no significant effects on either carcass traits or blood parameters but urea concentrations in blood plasma of broilers fed the diets containing 0.69, 1.035 and 1.38% urea were significantly higher compared with their control counterparts. Because of the depressed growth performance and poor economic efficiency of growth resulting from feeding the urea-containing diets, it can be concluded that urea addition as a source of non-protein nitrogen in broiler chick diets is nutritionally invaluable and not recommended.

Keywords: Dietary urea, growth performance, carcass traits, broiler chicks.

INTRODUCTION

Because of the ongoing increase in prices of feed ingredients destined for poultry, particularly protein sources, some unscrupulous feed processors or traders may illegally incorporate unnatural sources of nitrogen such as urea, biuret, uric acid and ammonium compounds in poultry feeds. The adulteration of poultry diets with these compounds as a source of non-protein nitrogen (NPN) is practiced in order to over-estimate their crude protein (CP) content. For example, including as little as 0.345 kg of urea (containing 46.5% nitrogen) into 100 kg diet is enough to increase its CP content by one percentage unit.

According to the scientific literature, the use of urea as a source of nitrogen in poultry nutrition is very limited, since most of attempts to obtain satisfactory utilization of various sources of NPN by chicks fed diets containing natural feedstuffs have been unsuccessful (Featherston, 1967). The utilization of various sources of NPN, including urea, diammonium citrate, and triammonium phosphate, has been demonstrated by several workers in chicks fed crystalline amino acid diets devoid of nonessential amino acids. In an early study, Allen and Baker (1972) illustrated the results of studies concerned with the utilization for weight gain and protein retention of various sources of NPN when added to crystalline amino acid diets for chicks. They found that the efficiency of utilization of diammonium citrate was about 70-90% of that of L-glutamic acid but diammonium phosphate and urea were utilized with an efficiency of less than 40% of L-glutamic acid. However, Trakulchang and Balloun (1975) reported that supplementing a low-protein practical diet with 0.43% urea did not significantly affect body weight gain or feed efficiency of growing chickens. But, Okumura *et al.* (1976) observed that the germ-free chicks did not benefit from urea supplement whereas the conventional birds showed better feed conversion efficiency and growth. In addition, Bruckental and Nitsan (1981) indicated that urea-nitrogen was utilized better for growth of chicks when the diets were supplemented with methionine rather than the unsupplemented diets.

In a later study, Das (1997) observed no adverse effects on growth of chicks of feeding urea up to a concentration of 15 g/kg in their diets. On the other hand, some studies suggested that broiler chicks fed dietary urea at a level of 1% exhibited an increase in both live body weight and carcass weight (Pervaz *et al.*, 1994), whereas levels beyond 4% had adverse effects on heath and performance of broilers (Pervaz *et al.*, 1994 and 1996; Javed *et al.*, 1995). Recently, Abdou *et al.* (2006) investigated the deleterious effect of adulteration of broiler rations by addition of urea at inclusion levels of 1, 3 and 5%. They found that birds fed the experimental diets, particularly which contained 3 and 5%, exhibited lower body weight gain and feed intake and poorer feed conversion compared with their control group. In addition, they observed significant pathological changes in kidneys, heart, liver and lungs of birds given 3 and 5% urea in their diets, and concluded that addition of urea to poultry diets has serious consequences on health and growth of birds.

Therefore, the present experiment was carried out to investigate the effects of feeding diets containing graded levels of urea (0.345, 0.69, 1.035 and 1.38%) on the performance, carcass traits, nutrient digestibility and some blood parameters of broiler chicks during the grower period (from 3 to 6 weeks of age).

MATERIALS AND METHODS

The present study was undertaken at the Poultry Research Unit; Agricultural Researches and Experiments Station; Faculty of Agriculture, Mansoura University, Egypt, from December 2007 to January 2008.

Experimental birds and diets:

During the starter period (0-3 weeks of age), unsexed Cobb-500 broiler chicks were kept in brooding batteries and given a commercial starter diet. At three weeks of age, 360 broiler chicks, having an average body weight of 645±5.89g, were randomly divided into five treatments, with 6 replicates each (12 chicks). The chicks were raised in wire-floored growing batteries, placed in a naturally ventilated house provided with a continuous fluorescent illumination. Five experimental diets of similar crude protein (18.9%) and energy (3150 kcal ME/kg) contents having five graded levels of urea (0.00, 0.345, 0.69, 1.035 and 1.38%) were formulated and used from 3 to 6 weeks of age. In order to evaluate the efficiency of chicks to utilize urea as a source of non-protein nitrogen, commercially available fertilizer-grade urea (containing 46.5% nitrogen) was added to the diets to supply 0.00, 1, 2, 3 and 4% crude protein equivalents, respectively. Thus,. Such amounts of urea were ground and manually homogenized with small amounts of finely-ground yellow corn and then, thoroughly mixed with the other feed ingredients. Composition and chemical analysis of these experimental diets are shown in Table 1. All birds had free access to feed and water and reared under similar environmental and managerial conditions throughout the experimental period.

Criteria of growth performance:

The growth performance of broiler chicks was measured in terms of feed intake (FI), live body weight (LBW), body weight gain (BWG) and feed conversion (FC) as well as mortality rate, nutrient digestibility, carcass traits and some blood parameters. Weekly FI and LBW, on a replicate group basis of birds, were determined; and thus, BWG and FC (g feed consumed: g BWG) were calculated throughout the whole experimental period (3 to 6 weeks of age). The economic efficiency of growth (EEG) was also calculated for the whole experimental period as follows: EEG= 100 × [(sale price per total gain - feed cost per total gain)/feed cost per total gain]. Mortality of birds, however, was monitored and recorded daily, and its cumulative rate was calculated.

Digestibility trials:

At 6 weeks of age, 6 chicks were selected from each treatment, around its average body weight, and placed in a separate battery compartment to serve as a metabolic cage, and fed its respective experimental diet for a period of three days. Chemical analyses of the experimental diets and droppings were carried out according to the official methods of analysis of the Association of Official Analytical Chemists (AOAC, 1990). To estimate protein digestibility, fractions of fecal and urinary nitrogen (N) of the droppings were chemically separated according to the procedure described by Jakobsen *et al*. (1960). The urinary organic matter was calculated by multiplying the percent of urinary nitrogen by the factor 2.62 (Abou-Raya and Galal, 1971). Digestibility coefficients of nutrients were calculated for dry matter (DM), organic matter (OM), crude protein (CP), crude fiber (CF), ether extract (EE) and nitrogen-free extract (NFE). The retention rates of ash (AR) and nitrogen (NR) were also determined.

Table (1): Composition and chemical analysis of the experimental diets

Ingredients	Dietary levels of urea added to grower diets (%)				
	0.0	0.345	0.69	1.035	1.38
Yellow corn	72.60	74.47	76.27	78.07	79.81
Soybean meal (44% CP)	9.20	8.355	7.51	6.615	5.72
Dicalcium phosphate	2.30	2.3	2.3	2.3	2.3
Limestone	1.50	1.5	1.5	1.5	1.5
Corn gluten meal (60% CP)	13.2	11.7	10.3	9.05	7.8
Common salt	0.3	0.3	0.3	0.3	0.3
Vit. & min.premix¶	0.3	0.3	0.3	0.3	0.3
DL-Methionine	0.1	0.13	0.19	0.19	0.25
Lysine-HCL	0.5	0.6	0.64	0.64	0.64
Urea§	0.0	0.345	0.69	1.035	1.38
Total	100	100	100	100	100
Calculated analysis (air dry basis, NRC, 1994)					
ME; kcal/kg	3149.9	3143	3136	3130	3124
CP; %	18.9	18.9	18.9	18.9	18.9
EE; %	3.16	3.19	3.22	3.25	3.27
CF; %	2.41	2.38	2.34	2.30	2.26
Ca; %	1.12	1.12	1.11	1.11	1.11
Total P; %	0.76	0.75	0.74	0.74	0.73
Av. P; %	0.49	0.49	0.48	0.48	0.48
Lys; %	0.96	1.01	1.01	0.97	0.94
Meth; %	0.48	0.49	0.52	0.52	0.54
Meth+Cys; %	0.82	0.81	0.83	0.81	0.81
Determined analysis (on dry matter basis, AOAC, 1990)					
DM; %	89.48	89.03	89.00	88.56	89.42
OM; %	83.39	82.88	82.88	82.32	83.23
CP; %	21.81	21.35	22.14	22.19	22.35
Ash; %	6.09	6.15	6.12	6.24	6.19
EE; %	3.34	3.51	3.82	3.44	3.46
CF; %	3.87	3.77	3.88	3.89	4.15
NFE; %	54.37	54.25	53.04	52.80	53.27
Cost per kg diet; P.T.	218	216	215	210	209

¶: Each 3 kg premix contains: Vit .A, 12,000,000 IU ;Vit. D_3, 2,500,000 IU ;Vit. B_2, 59 mg; Vit. B_6, 1.5 g; Vit. B_{12}, 10 mg; Biotin, 50 mg; Folic acid, 1.0 g; Nicotinic acid, 30 mg; Pantothenic acid, 10 g; Antioxidant, 10 g; Mn, 60 g; Cu, 10 g; Zn,55 g; Fe, 35 g; I,1.0 g; Co, 250 mg and Se, 150 mg.

§: Fertilizer-grade ground urea containing 46.5% nitrogen was added to diets to supply 0.00, 1, 2, 3 and 4% CP equivalents, respectively.

Carcass traits:

At the conclusion of experiment (6 weeks of age), 6 chicks per treatment with approximately similar body weights were selected for slaughter test. Prior to slaughter the birds were fasted for 16 hours. Just prior to slaughter and after complete bleeding, the birds were individually weighed, and immediately their feathers were plucked and carcass evisceration was performed. Procedures of cleaning out and excising the abdominal fat were performed on the hot carcasses. The weight of abdominal fat (AF) was determined. Records on the individual weights of eviscerated carcass (EC), breast yield (BY; including neck), thigh yield (TY; including back and drumsticks) and giblets (GIB; *i.e.* heart, liver without gall bladder and skinned empty gizzard) were also maintained. The dissection of carcasses was performed according to the standard procedure, by a professional operator. Total edible parts (TEP) were calculated as EC plus GIB. All measurements on carcass traits were expressed as percent of LBW at slaughter.

Blood parameters:

At the termination of experiment (6 weeks of age) blood samples were collected from the jugular veins of birds during slaughtering into heparinized tubes. Blood plasma was separated by centrifugation at 3000 rpm for 15 minutes. Concentrations of total protein (TPR), albumin (ALB), uric acid, urea, glucose (GLU), cholesterol (CHO) and triglycerides (TRI), and the activity of alanine aminotransferase (ALT) and aspartate aminotransferase (AST) in blood plasma were determined using commercial kits, according to the methods of Doumas *et al.* (1981), (Doumas *et al.*, 1971), Fossati *et al*., (1980), Patton and Crouch (1977), Trinder (1969), Allain *et al*. (1974), Fossati and Prencipe (1982) and Reitman and Frankel (1957), respectively.

Statistical analysis:

A completely randomized design was used. Data were statistically processed by one-way analysis of variance using Statgraphics Program (Statistical Graphics Corporation, 1991). The significant differences among means of treatments, for each criterion, were separated at P≤0.05 by LSD-multiple range test.

RESULTS AND DISCUSSION

Growth performance of chicks:

It is note-worthy that no mortality or morbidity was occurred in all treatments during the experimental period. Effects of feeding urea-containing experimental diets (from 3 to 6 weeks of age) on LBW, BWG, FI, FC and EEG of broiler chicks are presented in Table 2. There were significant depressions (P<0.01) in final LBW, BWG and FI of birds fed urea-containing diets as compared to their control group; however, FC and EEG were not significantly affected.

Table 2: Effects of feeding urea-containing diets on growth performance of broiler chicks from 3 to 6 weeks of age

Dietary urea level (%)	LBW[1] (g)		BWG[2] (g)	FI[3] (g)	FC[5] (g feed: g gain)	EEG[6] (%)
	3 wk	6 wk	3-6 wk-old	3-6 wk-old	3-6 wk-old	3-6 wk-old
Diet 1 (0.000)	644	1990[a]	1345[a]	3063[a]	2.29	142
Diet 2 (0.345)	621	1805[b]	1184[b]	2849[b]	2.42	131
Diet 3 (0.690)	647	1793[b]	1146[b]	2760[b]	2.44	132
Diet 4 (1.035)	660	1755[b]	1096[b]	2841[b]	2.61	120
Diet 5 (1.380)	652	1707[b]	1055[b]	2839[b]	2.74	114
SEM[7]	13.17	49.89	49.88	40.68	0.12	10.01
Significance level	NS	**	**	**	NS	NS

[1-7]: Refer to live body weight, body weight gain, feed intake, feed conversion, economic efficiency of growth and standard error of the means, respectively.

NS: Not significant., **: Significant at P≤0.01.

It is interesting to point out that although birds fed urea-containing diets consumed significantly lower amounts of feed (from 3 to 6 weeks of age) they exhibited insignificantly poorer values of FC and EEG. In the present study, the lack of significant differences in FC and EEG of the experimental broiler chicks could be attributed mainly to that the percent decreases in BWG due to feeding the urea-containing diets were dose-dependent (being 11.97, 14.80, 18.51 and 21.56%, respectively, relative to control) while percent reductions in FI were within a narrow range (being 6.99, 9.89, 7.25 and 7.31%, relative to their control counterparts).

It is interesting to state that the current experimental diets contained an equal CP content (18.9%) but the intact dietary proteins supplied only 17.9, 16.9, 15.9 and 14.9% of the CP equivalents of the urea-containing diets (diets 2, 3, 4 and 5) and the CP equivalents contributed by added urea were 1, 2, 3 and 4% in these diets, respectively (Table 1). In addition, synthetic lysine and methionine were added to the current experimental diets of broiler chicks in order to meet their requirements of these two essential amino acids (EAA) from 3 to 6 weeks of age. The added levels of these EAA ranged from 0.5 to 0.64% and from 0.1 to 0.25% for lysine and methionine, respectively (Table 1). As illustrated in Table 2, feeding urea-containing diets, even with levels of EAA particularly lysine and total sulfur-containing amino acids, depressed FI and retarded growth of broiler chicks, with insignificantly poorer FC and EEG compared with their control counterparts. The inclusion of greater amounts of synthetic amino acids along with urea, in the current experimental diets, probably produced a certain type of blood amino acid imbalance which may act as an appetite-depressing factor. The reduction in feed intake and concurrent lower intakes of energy and protein (primarily EEA), observed herein, could be the main factors responsible for growth depression in broiler chicks fed the urea-containing diets. Such retarded growth of birds fed the urea-containing diets is compatible with the earlier observations that poultry, like other nonruminant species, has a very limited capacity for the utilization of NPN because of some anatomical and metabolic aspects (Lewis, 1972).

The decreased FI and BWG of broiler chicks fed the urea-containing diets in the present study is in harmony with the results of Pervaz *et al.* (1994, Javed *et al.* (1995), Abdou *et al.* (2006) and Islam *et al.* (2006) who reported significant reductions in growth performance of broiler chicks fed diets containing between 2 to 6% urea. However, Das (1997) observed no adverse effects of feeding urea up to a concentration of 15 g/kg in the diets on the growth of chicks. On the other hand, Pervaz *et al.* (1994) suggested that broiler chicks fed dietary urea at a level of 1% exhibited an increase in live body weight.

Nutrient digestibility of the experimental diets:

Data on the digestibility of nutrients of 45-day old broiler chicks as affected by feeding urea-containing diets are given in Table 3. In the present study, it was observed that with an exception of slight significant ($P<0.05$) reductions in crude protein digestibility and rate of nitrogen retention in birds fed the 1.38% urea in their diet (Diet 5), while the other experimental groups (fed diets 2, 3 and 4) exhibited means of digestibility for DM, OM, EE, CF and NFE as well as ash retention comparable to those of the control birds. This means that dietary incorporation of urea, applied herein, had no adverse effect on nutrient digestibility of the experimental diets.

Table 3: Nutrient digestibility for 45-day-old broiler chicks as affected by feeding urea-containing diets

Dietary urea level (%)	DM[1] (%)	OM[2] (%)	CP[3] (%)	EE[4] (%)	CF[5] (%)	NFE[6] (%)	AR[7] (%)	NR[8] (%)
Diet 1 (0.000)	76.02	76.25	81.13[a]	80.21	33.16	82.18	42.83	75.85[a]
Diet 2 (0.345)	76.48	75.88	80.72[ab]	75.57	33.16	81.98	47.43	76.22[a]
Diet 3 (0.690)	75.22	74.81	79.31[ab]	76.72	33.32	81.43	47.55	73.74[ab]
Diet 4 (1.035)	75.20	74.71	79.78[ab]	77.05	34.86	80.97	45.52	74.16[ab]
Diet 5 (1.380)	72.55	72.05	78.13[b]	74.83	27.19	79.13	38.77	71.90[b]
SEM[9]	0.82	0.95	0.61	1.27	2.25	0.88	3.30	0.80
Significance level	NS	NS	*	NS	NS	NS	NS	*

[1-9]: Refer to dry matter, organic matter, crude protein, ether extract, crude fiber, nitrogen-free extract, ash retention, nitrogen retention and standard error of the means, respectively.

NS: Not significant. *: Significant at P≤0.05.

The present finding is in line with the concept that dietary urea can readily be absorbed from the upper part of the intestinal tract (Visek, 1972). In agreement with the present finding, Isikwenu *et al.* (2008) reported that nitrogen retention was significantly lower in broiler chicks fed increasing levels of urea-treated brewer's dried grains as a substitute for groundnut cake (up to 100%), on protein equivalent basis, in the finisher diets. In this regard, Bruckental and Nitsan (1981) fed chicks (from 5 to 25 days of age) on diets of different CP contents and contained urea levels of 0.9 or 2.5% and observed that when the diets were supplemented with methionine, replacement of some of the protein by urea did not affect nitrogen utilization (gain: nitrogen intake) of chicks but dietary urea negatively affected the nitrogen utilization in the not supplemented diets. The depressed growth performance coincided with a lack of adverse effect on nutrient digestibility of birds fed the urea-containing diets, reported herein, might be an indication that urea had some deleterious effect on the metabolic rather than the digestive level.

Carcass traits of broiler chicks:

Data in Table 4 illustrate the effects of feeding the urea-containing diets on relative weights of carcass traits (% of LBW at slaughter) of 42-day-old broiler chicks. It was observed that none of the estimated carcass traits of broilers was significantly affected by feeding the urea-containing diets in the present study.

This observation may be attributable to the fact that all the experimental diets, used in the present study, were of similar crude protein and energy contents and the range of dietary urea added was too low (from 0.345 to 1.38%) to have an evident effect on carcass traits. In agreement with the present result, Bruckental and Nitsan (1981) fed chicks on diets of different CP contents and contained urea at levels of 0.9 or 2.5%, and found no adverse effect of feeding the urea-containing diets on the relative weights (g/kg body weight) of liver or its fat content. Recently, Isikwenu *et al.* (2008) reported that carcass traits of broiler chicks were not affected by feeding urea-treated brewer's dried grains as a substitute for groundnut cake in the finisher diets. However, Pervaz *et al.* (1994) observed an increase in carcass weight of broilers fed 1% urea in their diet compared with the control birds. Composition of the basal diets, levels of urea added, and the method of feed processing are undoubtedly contributing factors for the inconsistent results published in the literature in that respect.

Table 4: Carcass traits (% of LBW) for 42-day-old broiler chicks as affected by feeding urea-containing diets

Dietary urea level (%)	LBW[1]	EC[2]	BY[3]	TY[4]	Giblets				TEP[8]	AF[9]
					LI[5]	GI[6]	HE[7]	Total		
	(g)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Diet 1 (0.000)	2124	69.2	38.3	30.9	1.6	1.3	0.38	3.1	72.3	1.8
Diet 2 (0.345)	1902	69.7	39.3	30.4	2.0	1.4	0.49	3.9	73.5	1.8
Diet 3 (0.690)	1901	70.5	38.4	32.1	2.2	1.5	0.48	4.2	74.7	2.1
Diet 4 (1.035)	2038	69.4	38.0	31.4	1.8	1.4	0.43	3.7	73.1	1.8
Diet 5 (1.380)	1929	69.0	37.6	31.4	2.0	1.6	0.48	4.0	73.0	2.3
SEM[10]	82.22	0.66	0.67	0.65	0.19	0.09	0.04	0.24	0.70	0.26
Significance level	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

[1-10]: Refer to live body weight, eviscerated carcass, breast yield, thigh yield, giblets, liver, gizzard, heart, total edible parts, abdominal fat and standard error of the means, respectively.

NS: Not significant.

Blood parameters of broiler chicks:

Data of blood parameters of 42-day old broiler chicks fed the urea-containing diets are presented in Table 5. It was observed that with the exception of an increase (P<0.01) in blood plasma urea concentrations of broilers fed the diets containing urea at levels of 0.69, 1.035 and 1.38% (Diets 3, 4 and 5, respectively), none of the other estimated blood parameters in the present study was affected by feeding the urea-containing diets.

Table 5: Blood plasma parameters of 42-day-old broiler chicks as affected by feeding urea-containing diets

Dietary urea level (%)	GLU[1]	TRI[2]	CHO[3]	TPR[4]	ALB[5]	Urea	Uric acid	ALT[6]	AST[7]
	mg/dL	mg/dL	mg/dL	mg/dL	mg/dL	mg/dL	mg/dL	U/L	U/L
Diet 1 (0.000)	184	110	113	5.26	2.85	1.03^{c}	2.40	31.2	118
Diet 2 (0.345)	190	120	114	5.32	2.74	1.28^{c}	2.39	35.5	118
Diet 3 (0.690)	184	116	115	5.44	3.22	1.58^{b}	2.35	28.2	122
Diet 4 (1.035)	188	117	115	5.06	3.04	1.82^{ab}	2.31	30.9	117
Diet 5 (1.380)	196	107	114	5.24	2.93	2.07^{a}	2.33	28.8	115
SEM[8]	6.98	4.87	4.41	0.20	0.19	0.09	0.09	2.34	5.04
Significance level	NS	NS	NS	NS	NS	**	NS	NS	NS

[1-8] Refer to glucose, triglycerides, cholesterol, total protein, albumin, alanine aminotransferase, aspartate aminotransferase and standard error of the means, respectively.

NS: Not significant. **: Significant at P≤0.01.

The increase in blood urea level of broilers due to feeding urea-containing diets, observed herein, has also been reported by several investigators (Bruckental and Nitsan, 1981; Karasawa and Umemoto (1993; Nagalakshmi *et al.*, 1999; Abdou *et al.*, 2006; Al-Ankari, 2006; Islam *et al.*, 2006). Similar observations were reported when urea, as a NPN source, was included in rabbit (Ismail *et al.*, 1999) and swine (Kornegay *et* al., 1970) diets.

CONCLUSION

Because of the depressed growth performance and poor economic efficiency of growth resulting from feeding urea-containing diets, it can be concluded that urea addition as a source of non-protein nitrogen in broiler chick diets is nutritionally invaluable and not recommended.

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المظاهر الإنتاجية وبعض المؤشرات الفسيولوجية لكتاكيت اللحم المغذاء على علائق محتوية على اليوريا خلال فترة ما بعد البادئ

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أجريت هذه الدراسة لبحث تأثير تغذية كتاكيت اللحم خلال فترة ما بعد البادئ على علائق محتوية على اليوريا على الأداء الإنتاجي ومعاملات هضم المركبات الغذائية وصفات الذبيحة وبعض معايير الدم. تم توزيع عدد 360 كتكوتا غير مجنس عمر 3 أسابيع من سلالة كوب-500 عشوائيا في 5 معاملات تجريبية متساوية بكل منها ستة مكررات متساوية. تم تكوين خمسة علائق تجريبية ذات محتويات متماثلة من البروتين الخام (18.9%) والطاقة القابلة للتمثيل (حوالي 3136 كيلوكالوري/كجم) تحتوي على 5 مستويات متدرجة من اليوريا (صفر أو 0.345 أو 0.69 أو 1.035 أو 1.38%)، تم تغذية الطيور عليها خلال الفترة من 3 حتى 6 أسابيع من العمر. وخلال فترة التجربة توفر لجميع الطيور حرية الوصول للغذاء والماء طوال الوقت كما خضعت جميع الطيور لنفس ظروف التربية. تم أخذ قياسات النمو المتمثلة في استهلاك العلف ووزن الجسم والزيادة الوزنية ومعدل التحويل الغذائي، وكذلك تم حساب الكفاءة الاقتصادية للنمو ومعدل النفوق كما تم تقدير معاملات هضم العناصر الغذائية ومواصفات الذبيحة وبعض قياسات الدم. ويمكن تلخيص أهم النتائج المتحصل عليها فيما يلي:

كان للتغذية على العلائق المحتوية على اليوريا أثرا سلبيا على الوزن الحي النهائي للطيور والزيادة الوزنية وإستهلاك الغذاء، ولم تؤثر المعاملات الغذائية معنويا على معدل التحويل الغذائي أو الكفاءة الاقتصادية للنمو أومعدل النفوق. حدث إنخفاض معنوي طفيف في معامل هضم البروتين الخام ومعدل إحتجاز النيتروجين في الطيور التي تغذت على العلائق المحتوية على 1.38% يوريا عن نظيرتها للطيور غير المعاملة، ولم تؤثر المعاملات الغذائية معنويا على معاملات هضم المادة الجافة أوالمادة العضوية أوالمستخلص الإثيري أوالألياف الخام أو المستخلص خالي الآزوت أومعدل إحتجاز العناصر المعدنية. لم يكن للتغذية على العلائق المحتوية على اليوريا تأثير معنوي على صفات الذبيحة أو معايير الدم بإستثناء إرتفاع معنوي في تركيز اليوريا في بلازما دم الكتاكيت التي تغذت على العلائق المحتوية على اليوريا بمعدل 0.69 أو 1.035 أو 1.38% عن نظيرتها للطيور غير المعاملة. وبناء علي نتائج هذه الدراسة، ونظر للتأثير السلبي على نمو الطيور وضعف الكفاءه الإقتصادية فإنه يمكن إستنتاج أن إضافة اليوريا (كمصدر للآزوت غير البروتيني) ليس له قيمة غذائية ولا ينصح بإضافتها إلى علائق كتاكيت اللحم.

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