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EFFECT OF LOW PROTEIN DIETS SUPPLEMENTED WITH LYSINE AND METHIONINE ON THE PERFORMANCE OF MUSCOVY DUCKLINGS

Sonbol, S.M.[1], G. A. Abd El-Rahman[1], R.E. Khidr[2] and Mona, M. Hassan[2]

[1.] **Faculty of Agriculture, Zagazig University. Zagazig, Egypt.**

[2.] **Desert Research Center, Mataria, Cairo, Egypt.**

ABSTRACT

This experiment was performed to asses response of muscovy ducklings (0-13 weeks of age) to low protein diets supplemented with lysine and methionine. The corn – soybean meal based experimental diets contained two levels of crude protein were supplemented with lysine and methionine .The influnce of supplemental amino acids was studied within each protein level.

The results showed that Muscovy ducklings received low protein(20%) diet with high lysine (1.20%) and 0.83% methionine+ cystine, had significantly ($P< 0.05$) the highest value of average live body weight (876.60 g) during the starting period (0-4 w.k). However, during the finishing and the total period ducklings fed on diet contained high protein diet with low lysine and low methionine+cystine, had a highly significant ($P < 0.01$) increase in body weight, weight gain and improved the feed conversion values. Higher percentage of feather, giblets were recorded in group fed on a diet contained low protein with low lysine and high methionine+cystine%. However, higher percentage of carcass (72.41) was recorded for group fed high protein with low lysine and high methionine+cystine%. The lowest feed cost/kg. gain was (62.50%) recorded by group fed high protein with low lysine and low methionine+cystine levels. It could be recommended in the diet 22% protein, 1.10% lysine and 0.83% methionine+cystine during the starting period (0-5 wk.) followed by diet contained 18% protein, 0.90% lysine and 0.70% methionine+cystine, during the finishing period (5-13 wk.) of age.

Keywords: Ducklings, protein, lysine and methionine.

INTRDUCTION

The protein cost is considered mainly the most expensive item in ducks production. Animal protein sources expensive as compared to plant protein sources, but; plant protein are nutritionally imbalanced, therefore some of essential amino acids should be supplemented. Methionine and lysine are generally the first and second limiting amino acids in corn-soybean diets (D'Mello, 1994) and protein requirement may be reduced in corn-soybean meal-type diets by supplementation with methionine and lysine (Waibel *et al.*, 1995). So, using the optimum level of crude protein and supplementing corn soybean diets with the essential amino acids would cause an increase in the net profit.

The present work aimed to study the response of muscovy ducklings to low protein diets supplemented with lysine and methionine.

MATERIALS AND METHODS

The experimental work of the present study was carried out at Ras Suder Research Station (Desert Research Center) in southern Sinai Governorate. The field work started on 3rd September 2003 and terminated 13 weeks later.

Three hundred and twenty Muscovy ducks of genotype ST_{1} were randomly divided into eight experimental groups, equal in number (40 each). Each group was allocated to replicates (20 each), in a factorial desigen 2 x 2x 2, which contained two dietary protein levels; P1 (22 and 18%), P2 (20 and 16%) during the starting and finishing period, respectively. Within each protein level; ducklings were divided into two sub-groups that fed on diets contained two lysine levels, Lys1 (1.20 and 1.05%) or Lys2 (1.10 and 0.90%) during the starting and finishing period, respectively. Within each lysine groups; ducklings were divided into two sub-group which contained two levels of total sulfur amino acids,TSAA.1 (0.93 and 0.80%), or TSAA..2 (0.83 and 0.70%) during the starting and finishing period, respectively. The xperimental design of the experiment are presented in table 1, while the composition of the experimental diets during the starting and finishing periods are presented in table 2.

Table (1): Experimental design

Treatment Group	E			Finisher		
	Protein %	Lysine %	Methionine+cystine %	Protein %	Lysine %	Methionine +cystine%
1	22	1.20	0.93	18	1.05	0.80
2			0.83			0.70
3		1.10	0.93		0.90	0.80
4			0.83			0.70
5	20	1.20	0.93	16	1.05	0.80
6			0.83			0.70
7		1.10	0.93		0.90	0.80
8			0.83			0.70

Feed and water were offered *ad libitum* during the whole experimental period. Individual bird weights and feed consumption were recorded at different intervals. Feed conversion was calculated as g feed/g gain. At the end of the experimental period, 8 ducks (4 males and 4 females) were randomly from each group, fasted for 12 hours, then slaughtered to estimate the dressing weight percentage as well as the other carcass traits relatively to the live body weight.

Statistical analysis was carried out according to Snedecor and Cochoran (1982). The statistical model which used in the analysis was:

$Y_{ijk1} = U + P_i + L_j + M_k + PL_{ij} + PM_{ik} + LM_{jk} + PLM_{ijk} + e_{ijkl}$

Where:

Y_{ijk1} = An observation,

U = the overall mean,

P_i = the protein level in the diets (i = 1 and 2),

Table (2): Composition and chemical analysis of the experimental diets (0- 13 weeks old)

Ingredients %	Starter (0- 5 weeks)								Finisher (5- 13 weeks)							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
Yellow corn	58.71	58.81	57.50	57.50	63.00	63.00	63.00	63.00	69.14	69.24	69.20	69.30	72.00	72.10	72.10	72.20
Soy bean meal (44%)	35.50	35.50	30.34	30.44	31.60	31.80	31.70	31.80	26.80	26.80	26.80	26.80	20.72	20.72	20.72	20.72
Corn gluten (60%)	2.00	2.00	5.00	5.00	-	-	-	-	-	-	-	-	-	-	-	-
Wheat bran	-	-	3.40	3.40	1.40	1.30	1.40	1.40	-	-	-	-	3.00	3.00	3.00	3.00
Di-calcium phosphate	1.90	1.90	1.80	1.80	1.90	1.90	1.90	1.90	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Limestone	1.10	1.10	1.20	1.20	1.10	1.10	1.10	1.10	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Sodium chlorid	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Vit. & Min premix*	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
DI- Methionine	0.19	0.09	0.16	0.06	0.28	0.18	0.28	0.18	0.20	0.10	0.20	0.10	0.26	0.16	0.26	0.16
lysine	-	-	-	-	0.12	0.12	0.02	0.02	0.06	0.06	-	-	0.22	0.22	0.12	0.12
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Chemical omposition**																
Crude protein (%)	22	22	22	22	20	20	20	20	18	18	18	18	16	16	16	16
Kcal (ME)/ kg feed	2840	2840	2839	2836	2838	2847	2835	2838	2920	2920	2920	2920	2920	2920	2920	2920
Calorie/protein (ratio)	129	129	129	129	142	142	142	142	162	162	162	162	182	182	182	182
Lysine	1.20	1.20	1.10	1.10	1.20	1.20	1.10	1.10	1.00	1.00	0.94	0.94	1.01	1.01	0.90	0.90
Methionine+cystin %	0.93	0.83	0.93	0.83	0.93	0.83	0.93	0.83	0.80	0.70	0.80	0.70	0.80	0.70	0.80	0.70
Calcium %	1	1	1	1	0.99	0.94	0.94	0.94	0.98	0.98	0.98	0.98	0.97	0.97	0.97	0.97
Total phosphorus	0.74	0.74	0.74	0.74	0.74	0.76	0.76	0.76	0.74	0.74	0.74	0.74	0.75	0.75	0.75	0.75

* Vitamin and Minerals premix 0.30 of the diet supplies the following per kg of the diets: vit.A 1200 IU, vit. D. 2500 IU, vit. E. 10 mg, vit K. 3mg, vit B_1. 1mg, vit B_2. 4mg pantothenic acid 10mg, folic acid 1mg , niacine 40mg, vit, B_6 3mg, vit B_{12} 20mcg, Mn. 62 mg, fe 44mg, Zn. 56mg, cu 5mg and se 100mg.

** Calculated according to NRC (1994).

L_j = the lysine level in the diets (j = 1 and 2),
M_k = the methionine level in the diets (K = 1 and 2),
PL_{ij} = the interaction between protein level and lysine level (ij = 1,2,...,4),
PM_{ik} = the interaction between protein level and methionine level (ik=1,2,...,4),LM_{jk} = the interaction between lysine level and methionine level.
PLM_{ijk} = the interaction between protein, lysine level and methionine level (jk = 1,2,...,4),
e_{ijk1} = Random error.

Duncan's new multiple range test (Duncan, 1955) was used to detected the significance between means.

RESULTS AND DISCUSSION

Live Body Weight (BW)

The effects of dietary treatments on body weight are illustrated in Table 3. At 3 weeks of age, Ducklings fed diets contained P2 (20%) with Lys.2 (1.10%) and TSAA.1 (0.93%) had significantly (P<0.05) the heaviest body weight (522.10 g). At 4 weeks of age, ducklings fed diet P2 (20%), Lys.1 (1.20%) and TSAA.2 (0.83%) had significantly (P<0.05) the heaviest body weight (876.60g); however, at 9 and 13 weeks of age; ducklings fed on diet contained P1 (18%), L2 (0.90%) and TSAA2 (0.70%) had significantly (P < 0.01) the heaviest body weight meanwhile; the lowest body weight was recorded by group fed on diet obtained P1 (18%) , lys1 (1.05%) and TSAA1(0.80%). This may due to that free amino acid supplements are absorbed more rapidly than protein-bound amino acids resulting in an imbalanced supply of amino acids, imbalanced diets depressed feed intake followed by a retardation of growth. Similar results were obtained by Wang *et al.* (2004) who found that methionine supplementation of diets meat ducks, significantly improved body weight at 21 days of age. Also, Leclercq and De. Carville (1989) observed that live body weight of male muscovy ducklings from 8 to 12 weeks of age improved as the protein level increased from 15 to 17%.

Body Weight Gain

Ducklings fed on diet contained P1(20%) with Lys2 (1.10%) and TSAA.1 (0.93%) had significantly (P < 0.01) the highest weight gain (473.42 g) during the period 0-3 weeks of age. However, there were no significant differences between treatments during the periods 0-4 and 0-5 weeks of age. During the periods; 5-9 and 9-13 weeks of age; ducklings received P1 (18%) with Lys_2 (0.90%) and TSAA2 (0.70%) showed a significant (P< 0.01) increase in weight gain, being (839.1g). Ducklings fed on P1 with Lys_2 and $TSAA_2$ during the whole experiment had significantly (P < 0.01) the highest value of weight gain, followed by group fed p_2, Lys_1 and TsAA2 while the lowest value of weight gain was recorded by group fed diet contained p_1, Lys $_1$ and $TSAA_1$.(Table 4).

Table (3):Effects of protein, lysine and TSAA. levels on average body weight ($\bar{X}$ ± SE) of ducklings

Age (weeks)	P1				P2			
	Lys1		Lys2		Lys1		Lys2	
	TSAA1	TSAA2	TSAA1	TSAA2	TSAA1	TSAA2	TSAA1	TSAA2
0	49.1± 0.7	49.3± 0.7	48.7±0.8	48.0± 0.6	49.9± 0.9	48.9± 0.7	48.7±0.5	47.9±0.5
3	433.2± 18.7^{d}	470.6 ± 16.9 ^{c}	427.9± 19.1^{d}	495.5 ± 14.1^{b}	479.9± 16.3^{bc}	500.4± 16.4 ^{b}	522.1 ± 13.9^{a}	496.6± 12.8 ^{b}
4	788.0 ± 29.8^{de}	811.5 ± 31.6 ^{cd}	763.4± 36.2^{ef}	836.7±21.2b^{c}	781.4±23.2^{e}	876.6±25.1^{a}	862.6±22.5^{ab}	799.2±23.7^{de}
5	1142.5± 33.9	1120.9± 39.6	1152.6± 53.0	1273.7± 32.0	1185.3± 30.7	1214.6±30.8	1147.6±31.4	1174.0±34.8
9	2826.5±76.2^{e}	2861.9±93.0^{de}	2960.4±100.8^{cd}	3371.0± 98.8^{a}	3053.1±97.1^{bc}	3106.2±96.6^{b}	2849.8±95.1^{de}	3091.0±86.9^{b}
13	3501.2±77.7^{d}	3559.0±94.0^{d}	3683.9± 100.1^{c}	4185.1± 91.0^{a}	3749.8±91.5^{bc}	3862.6±98.1^{b}	3530.4±96.9^{d}	3857.5±87.3^{b}

a ,b means in the same row with different superscripts differ significantly at (p<0.05)

Table (4):Effect of protein, lysine and TSAA levels on weight gain ($\bar{X}$ ± SE) of ducklings

Age (weeks)	P1				P2			
	Lys1		Lys2		Lys1		Lys2	
	TSAA1	TSAA2	TSAA1	TSAA2	TSAA1	TSAA2	TSAA1	TSAA2
0-3	384.0± 18.1^{d}	421.3± 16.2^{c}	379.1 ± 18.3^{d}	447.5± 13.5^{b}	430.0 ± 15.5^{bc}	451.4 ± 15.6^{b}	473.2± 13.4^{a}	448.7± 12.3^{b}
0-4	738.9± 29.2	762.2± 31.0	715.0 ± 36.2	464.8 ± 37.1	731.5 ± 22.6	827.7 ± 24.4	813.9 ± 22.0	799.2 ± 23.7
0-5	1093.4± 33.4	1072.4± 39.3	1103.4± 52.2	1227.8 ± 31.8	1135.4 ± 30.9	1165.7 ±30.8	10.98.9± 31.4	1162.1± 34.8
5-9	1684.0± 60.8^{d}	1728.1± 68.8^{cd}	1807.9 ± 71.6^{bc}	2096.6± 90.7^{a}	1867.8 ± 83.9^{b}	1891.9 ± 81.4^{b}	1702.1± 97.3^{d}	1917.1± 81.5^{b}
9-13	674.7 ± 10.0^{e}	702.2± 11.9^{cd}	723.5 ± 14.7^{c}	839.1 ± 20.8^{a}	746.6± 23.3^{b}	755.9 ± 18.7^{b}	680.6± 17.6^{de}	766.5± 19.7^{b}
0-13	3455.6 ± 78.2^{d}	3509.6± 93.7	3635.0 ± 99.5^{c}	4612.1± 91.9^{a}	3749.9 ± 91.2^{bc}	3813.7 ± 98.1^{b}	3481.7± 97.0^{d}	3809.6±87.2^{b}

a, b means in the same row with different superscripts differ significantly (P< 0.01).

Similar results were obtained by Lai-Mingkueipolasek *et al.* (2003) who found that the highest weight gain of Peking ducks was obtained when they fed on low protein diets supplemented with lysine and methionine during the period from 0 to 3 weeks of age. Also, Leeson *et al.* (1982) reported that 18% curde protein during the finishing period was adequate for maximum weight gain of ducks.

Feed Conversion ratio (g feed/g gain)

Statistical analysis showed that feed conversion of ducklings was significantly ($P < 0.01$) better (1.34) when the diet contained P2 (20%) with Lys2 (1.10) and TSAA1 (0.93%) during the period 0-3 weeks of age. However, feed conversion of ducklings fed on diets contained P1 with Lys2 and TSAA2 was significantly ($P< 0.01$) the best (3.13) as compared to the other treatments during the whole experimental period (0-13 wk.) as shown in Table 5. Similar results were obtained by leclercq and De-carville (1989) who found an improvement in feed conversion of male Muscovy ducklings fed on a diet contained 17% as compared to those fed on 13% crude protein during the finishing period. Ibrahim (2004) showed that feed conversion of Muscovy ducklings was improved when diet contained low methionine (0.60%) level as compared with high methionine level (0.70%) during the finishing period.

Protein efficiency ratio (PER)

Data reflecting the average PER values are shown in Table (6). The PER values of ducklings was increased (2.13) significantly ($P < 0.05$) when ducklings fed on a diet contained P2 with Lys2 and TSAA2 during the period form 0 to 4 weeks of age. However, TSAA1 (0.93%) had improved significantly ($p< 0.01$) the PER of ducklings during the period 0 to 5 weeks of age. During the periods 5-9, 9-13 and 0-13 weeks of age, ducklings fed on diets contained P2 (16%) with Lys2 and TSAA2 had significantly ($P< 0.01$) the highest PER as compared to the other treatments group, it may reflect the effects of amino acids imbalances which reduced the efficiency of protein utilization, (D'Mello. 1994).Similar results were obtained by Sonbol, et al., (2001). Who reported that ducklings fed lower protein diets during the starting and finishing periods had significantly higher PER.

Sonbol and Habeeb (1991) showed that PER was impoved when broiler diet supplemented with 0.10% mehionine.

Carcass traits

Results in Table 7 showed that higher significant ($P< 0.05$) blood percentage was recorded for ducklings that fed on a diet contained P2 with Lys1 and TSAA2 .The highest significant ($p< 0.01$) reather and giblets percentage was recorded for ducklings fed on a diet contained P2 with Lys2 and TSAA1. However, ducklings fed on diets contained P1 with Lys2 and TSAA1 had significantly ($p< 0.05$) the highest carcass percentage being 72.41. Similar results were obtained by Dean (1977) who reported that adding methionine to a corn-soya based diet, impoved feathering of pekin ducks during the finishing period. Mazanowski *et al.* (1991). showed that increasing the protein level form 13 to 16% improved the carcass quality of ducks.

Table (5):Effects of protein, lysine and TSAA levels on feed conversion ($\bar{X}$ ± SE) of ducklings

Age (weeks)	P1				P2			
	Lys1		Lys2		Lys1		Lys2	
	TSAA1	TSAA2	TSAA1	TSAA2	TSAA1	TSAA2	TSAA1	TSAA2
0-3	1.83 ± 0.04^{a}	1.84 ± 0.04^{a}	1.82 ± 0.06^{a}	1.75 ± 0.02^{b}	1.79± 0.01^{ab}	1.58± 0.12^{a}	1.34 ± 0.01^{d}	1.51 ± 0.04^{c}
0-4	1.28± 0.01^{d}	1.42 ± 0.01^{c}	1.36 ± 0.04^{c}	1.25 ± 0.01^{d}	1.56± 0.02^{a}	1.49 ± 0.08^{b}	1.26 ± 0.02^{d}	1.18±0.04^{e}
0-5	2.24 ± 0.02^{d}	2.76 ± 0.03^{a}	2.62 ± 0.12^{b}	2.12 ± 0.03^{e}	2.48± 0.02^{c}	2.49 ± 0.01^{c}	2.22 ± 0.01^{d}	2.28 ± 0.03^{d}
5-9	4.82 ± 0.15^{a}	4.10 ± 0.01^{b}	3.85 ± 0.04^{c}	3.23 ± 0.01^{f}	3.47± 0.11^{de}	3.63 ± 0.01^{d}	4.25 ± 2.23^{b}	3.40 ± 0.14^{ef}
9-13	6.30 ± 0.06^{a}	5.79 ± 0.02^{c}	5.33 ± 0.01^{d}	4.40 ± 0.03^{g}	4.69 ± 0.02^{f}	5.06 ± 0.10^{e}	5.98 ± 0.16^{b}	4.72 ± 0.05^{f}
0-13	4.29 ± 0.07^{a}	4.07 ± 0.05^{b}	3.77 ± 0.01^{c}	3.13 ± 0.01^{f}	3.42 ± 0.05^{e}	3.56± 0.01^{d}	3.95 ± 0.15^{b}	3.34 ± 0.07^{e}

a, b means in the same row with different superscripts differ significantly (P< 0.01).

Table (6):Effects of protein, lysine and TSAA levels on protein efficiency ratio ($\bar{X}$ ± SE) of ducklings

Age (weeks)	P1				P2			
	Lys1		Lys2		Lys1		Lys2	
	TSAA1	TSAA2	TSAA1	TSAA2	TSAA1	TSAA2	TSAA1	TSAA2
0-3	1.25±0.05	1.25± 0.05	1.25±0.05	1.30±0.01	1.40± 0.01	1.37± 0.09	1.47±0.38	1.66±0.03
0-4	1.78 ±0.01^{c}	1. 61± 0.01^{d}	1.68± 0.06^{d}	1.83± 0.01^{c}	1.61± 0.02^{d}	1.68± 0.09^{d}	1.99± 0.03^{b}	2.13±0.06^{a}
0-5	2.03±0.01^{d}	0.65±0.02^{f}	1.74±0.08^{e}	2.15±0.03^{c}	2.02±0.01^{a}	2.01±0.01^{d}	2.25±0.01^{a}	2.19±0.03^{b}
5-9	1.16±0.04^{e}	1.36±0.01^{d}	1.45±0.02^{c}	1.73±0.01^{b}	1.80±0.06^{ab}	1.73±0.01^{b}	1.48±0.08^{c}	1.85±0.08^{a}
9-13	0.88±0.01^{e}	0.97±0.01^{d}	1.05±0.01^{c}	1.27±0.01^{b}	1.34±0.01^{a}	1.24±0.03^{b}	1.05±0.03^{c}	1.33±0.02^{a}
0-13	1.25±0.02^{g}	1.31±0.02^{f}	1.41±0.01^{e}	1.70±0.01^{bc}	1.73±0.03^{b}	1.67±0.01^{c}	1.52±0.05^{d}	1.79±0.03^{a}

a ,b means in the same row with different superscripts differ significantly (p<0.01)

Table (7):Effect of protein, Lysine and TSAA levels on some carcass traits ($\bar{X}$ ± SE) of ducklings at 13 weeks of age

Carcass traits	P1				P2			
	Lys1		Lys2		Lys1		Lys2	
	TSAA1	TSAA2	TSAA1	TSAA2	TSAA1	TSAA2	TSAA1	TSAA2
Preslaughter weight (g)	3500.0 ± 318.9	3478.8 ± 355.9	3620.0± 362.0	3292.5± 198.9	3452.5± 268.6	3747.5 ± 390.8	3416.3± 319.9	3848.8± 490.6
Blood %	5.24 ± 1.10^{b}	4.83 ± 0.89 ^{b}	2.81 ± 0.02^{c}	5.24 ± 0.20^{b}	6.65 ± 0.26^{a}	6.98 ± 0.70^{a}	6.59 ± 0.95^{a}	6.38 ± 0.14 ^{a}
Feather %	5.80 ± 0.78^{b}	4.88 ± 0.47 ^{c}	5.14 ± 0.01^{bc}	3.88± 0.05^{d}	5.68 ± 0.64^{b}	3.57 ± 0.16 ^{de}	6.91 ± 0.72^{a}	3.07 ± 0.05^{e}
Giblets %	2.74 ± 0.10^{e}	3.39 ± 0.007^{c}	2.75± 0.02^{e}	3.93 ± 0.14^{a}	3.66 ± 0.04^{b}	3.51 ± 0.14 ^{bc}	3.97 ± 0.31^{a}	3.12 ± 0.21^{d}
Liver %	1.90± 0.09	2.01 ± 0.11	2.41± 0.01	2.40 ± 0.20	2.55 ± 0.13	2.07 ± 0.32	2.19 ± 0.31	2.05 ± 0.05
Carcass %	69.72 ± 1.08^{c}	70.23± 1.62^{bccc}	72.41± 0.14^{a}	65.00± 1.20^{f}	68.53 ± 0.91^{d}	66.89 ± 1.85^{e}	71.64 ± 1.68^{ab}	69.18± 2.08 ^{cd}

a, b means in the same row with different superscripts differ significantly (P< 0.01).

Feed cost

It could be concluded from Table (8) that highest feed cost "LE"/ kg gain during the experimental period was recorded by group fed P1 with Lys1 and TSAA1, while, the lowest feed cost/kg gain was recorded by group fed P1 with Lys2 and TSAA2. Similar results were obtained by Torkia (2002) who reported that feed cost significantly increased in hens fed a diet contained high protein level with higher lysine and methioine supplementation as compared to hens feed a diet contained high protein level with the lowest level of methioine and lysine. Rukmangadhan, *et al.* (1990) found that for optimal costs of Khalki Campbell ducks; diets must containe 22 and 18% crude protein in the starting and finishing period, respectively.

Table(8):Effects of protein lysine and TSAA. levels on feed cost/ kg gain

Treatments group	Feed cost /kg. gain	%
1	1.37	100
2	1.22	88.89
3	1.06	77.89
4	0.85	62.50
5	0.95	69.86
6	1.03	75.52
7	1.15	84.31
8	0.88	64.67

Conclusion

It could be concluded that; feeding Muscouy ducklings on diet contained low protein level (20%) supplemented with 0.10 % of methionine was sufficient to obtaine maximume growth during the period 0-4 weeks of age .At the5th week of age feeding Muscouy ducklings on diet contained 22% protein, 1.10% lysine and 0.83% TSAA. followed by 18% protein, 0.90% lysine and 0.70 TSAA. during the finishing period (5-13 wk.), improved body weight, weight gain and feed efficiency.

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تأثير إضافة الليسين والمثيونين للعلائق منخفضة البروتين على معدل آداء البط المسكوفي

شريف محمد سنبل[1] – جمال الدين عبد الرحمن[1]– رأفت السيد خضر[2] و منى محمد على حسن[2]

١– كلية الزراعة – جامعة الزقازيق.

٢– قسم تغذية الحيوان والدواجن – مركز بحوث الصحراء – المطرية – القاهرة.

أجريت هذه الدراسة على ٣٢٠ كتكوت بط مسكوفى عمر يوم ولمدة ١٣ أسبوع حيث قسمت الطيور عشوائيا إلى ٨ مجاميع تجريبية فى تصميم احصائى ٢×٢×٢ (بكل مجموعة ٤٠ طائر قسمت إلى ٢ مكررة بكل مكررة ٢٠ طائر).

اشتملت المجاميع على أحد مستويين رئيسيين من البروتين مستوى مرتفع (٢٢ ، ١٨%) أو مستوى منخفض (٢٠ ، ١٦%) خلال مرحلتى (البادئ والناهى) على التوالى. كل مستوى من البروتين تم تقسيمه إلى مجموعتين فرعيتين تحوى إما مستوى ليسين مرتفع (١,٢٠ و ١,٠٥%) أو ليسين منخفض (١,١ و ٠,٩٠%) خلال مرحلتى (البادئ والناهى) على التوالى، ثم قسمت مجاميع الليسين التجريبية إلى تحت مجاميع اشتملت على إما مستوى مرتفع من الميثونين+السستين (٠,٩٣ و ٠,٨٣%) أو مستوى مثيونين+ سستين منخفض (٠,٨٠ و ٠,٧٠%) خلال مرحلتى (البادئ والناهى) على التوالى.

وتشير النتائج إلى أن تغذية البط المسكوفى خلال مرحلة البادئ على عليقة منخفضة البروتين مع انخفاض فى محتواها من الليسين وارتفاع محتواها من الاحماض الامينية الكبريتية أدى إلى حدوث زيادة معنوية (P <0.01) فى الوزن الحى، كما أنه عند التغذية على عليقة مرتفعة فى محتواها من البروتين ، منخفض فى الليسين ومنخفض فى محتواها من الاحماض الامينية الكبريتية أدت للحصول على أفضل وزن حى، مع أعلى زيادة فى الوزن، أعلى كفاءة من تحويل الغذاء خلال مرحلة الناهى ٥–٩ ، ٩–١٣ و ٠ – ١٣ أسبوع من العمر.

أوضحت المعاملات زيادة معنوية فى وزن الدم، الريش والأحشاء المأكولة (p < ٠,٠١) للمجموعة المغذاة على عليقة احتوت على ٢٠% بروتين، ١,١% ليسين و ٠,٩٣ مثيونين+ سستين فى البادئ ثم ١٦% بروتين، ٠,٩٠ ليسين و ٠,٨٠ ميثونين فى الناهى.

نستخلص من النتائج المتحصل عليها من هذه التجربة أن أفضل تركيبة لعلائق البط المسكوفى والتى تحقق أعلى معدل نمو مع أقل تكلفة هى:

عليقة مرحلة البادئ (٠ – ٥ أسابيع):

وتحتوى على ٢٢% بروتين، ١,١% ليسين و ٠,٨٣% ميثونين + سستين

عليقة مرحلة الناهى (٥– ١٣ أسبوع) :

وتحتوى على ١٨% بروتين، ٠,٩٠% ليسين ، ٠,٧٠% مثيونين + سستين