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EFFECT OF SEX, FEEDING SYSTEM AND BODY WEIGHT ON SOME PRODUCTIVE AND PHYSIOLOGICAL RESPONSES IN PEKIN DUCKS

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ABSTRACT

Seventy-two Pekin ducklings aged 56 days were divided into two groups (36 males and 36 females). Birds from each sex were divided into two experimental diets {Force feeding and ad-libtum (commercial diet)} for 21days.Birds from each experimental diet were divided into three groups according to their body weight (heavy, medium and light). This work aimed to study the effect of sex, short time of force feeding and body weight on some productive and metabolic responses of Pekin ducks. Results obtained showed that:

Males were higher in their body weight and improved feed efficiency than females. Force-feeding significantly increased body weight and weight gain. Heavy weight ducks were superior in their body weight and weight gain.

Females significantly had the higher absolute and relative weights of abdominal fat (33.5 gm and 3.35 % Vs32.1 gm and 3.21%, respectively). Force-feeding increased absolute and proportional weights of liver, carcass traits abdominal fat. Birds of heavy group were superior in absolute weights of liver, carcass traits and abdominal fat.

Females had higher serum total protein, albumin and globulin than males. Force-feeding increased serum total protein3.56 gm/dl), globulin (2.09 gm/dl) and serum cholesterol (281.0 mg/dl) than feeding ad-lib. (3.40,1.89 gm/dl and 261.7 mg/dl, respectively). However, ad-lib. feeding significantly increased A/G ratio. Heavy body weight ducklings had significantly the highest averages of serum total protein, albumin, globulin and cholesterol.

Tissues creatinine significantly increased in males (0.781 mg/g) than Females (0.735 mg/g), while, serum creatinine was significantly higher in females (0.499 mg/dl) than males (0.314mg/dl). Force-feeding recorded significantly the higher averages of serum and tissues creatinine. Birds of heavy group had significantly the highest averages of serum uric acid and tissues creatinine. However, serum creatinine recorded significantly its highest value in medium body weight birds.

Females had significantly higher serum GOT and alkaline phosphatase than males. Force-feeding increased significantly serum GOT and GPT transaminases .Serum GOT and GPT transaminases increased in medium body weight ducklings. On the other hand, heavy body weight ducklings recorded the highest average of serum alkaline phosphatase.

INTRODUCTION

Egyptian human have know waterfowl production thouthands of years ago, as duck production ranked second after chicken's production for the majority of human. Ducks meat is of high quality regarding the palatability, especially after force- feeding. Ducks have higher production ability modest,

easily management and higher resistance to diseases when with the production of the other animals as examples. There is a quite huge deficiency in the Egyptian citizen share regarding duck and geese meat, even if we discarded young children and infants who do not consume meat (1.12 kg, duck and 0.57 kg geese/person/year) EL-Sayed (1990).

Fattening the waterfowls by manual cramming was a common force feeding procedure in the countryside of the ancient Egyptian and still applied up till now (Yamani, 1990).

Force-feeding with excessive amount of food for 10-14 days during the finishing period is one of the fattening methods used commercially (Wang *et al.*, 1981). However, (Yamani *et al.*, 1973; Marai and Yamani, 1974 and Zhou *et al.*, 1990) reported that, the cramming period used ranged between 11 to 42 days.

Waterfowl species genetically differ in growth rates and in the degree to which males grow faster than females. White Pekins typically exhibit early growth with only a slight difference in size between sexes (Swatland, 1980 and Pingel 1990).

Kamar and Yamani (1980) showed that, Pekin males were heavier than females during all ages except the first three months of age. However (Singh *et al.*, 1976 and Isshak *et al.*, 1986) indicated that males Pekin ducklings had heavier body weight than females ones at 10 weeks of age.

In immature Pekin ducks, heavy birds significantly higher than light birds in body weight in live body weight, thyroxin, cortisol, albumin and albumin /globulin ratio. While, light ducks were significantly higher than heavy birds in serum cholesterol and inorganic phosphorus (EL-Sayiad *et al.*, 1988).

Niespodziewanski, 1971 and Zhou *et al.*,(1990) reported that, force-feeding increased all the blood levels of cholesterol, esters and total protein. However it reduced the degree of esterifications. They concluded that males had more blood cholesterol than females. Nir (1972) and EL-Gendi (1994) also indicated that, force-feeding increased plasma total lipids, cholesterol and triglycerides. Glutamic oxaloacetic transaminase and glutamic pyruvic transaminases have remarkable action in catabolicreaction of amino acid (West *et al.*, 1968) they are widely distributed in various body tissues and are normally present in the blood serum in different concentration. Their level in blood serum is used to detect liver and heart function.

This work was aimed to study and evaluate the productive and physiological responses of Pekin ducks to sex, body weight and short term force-feeding.

MATERIALS AND METHODS

This study was carried out at the Poultry Research farm belonging to Department of Animal Production. Faculty of Agriculture, Zagazig University, Benha branch.

A total number of 600 day old White Pekin ducklings were used in this study .The birds were reared in a floor brooder and supplied with fresh water and fed ad-libtum, a starter diet containing 22% crude protein and 2871 Kcal

ME/Kg up to the 21st days. Grower diet containing 16% crude protein and 2900 kcal ME/kg was then applied from three to eight weeks of age. The temperature around the ducklings were 32° c for the first week then reduced gradually by 4° c weekly till reached 24° c. Ducklings were provided with continuous light from hatching up to 2 weeks old. After two weeks of age, the ducks were reared under the natural daylight and temperature.

Experimental ducklings included 36 males and 36 females.each of males and females were divided into two groups according to feeding system (force-feeding and Ad-libtum). Each group was classified into three subgroups according to their body weight as heavy, medium and light each of 6 ducklings (means ± standard deviation).

Birds fed ad-libtum were fed the previously mentioned grower diet, while birds that force fed were afford diet consisted of 50% yellow corn, 49.5% Faba Bean and 0.5% salt. Cramming was done twice daily at 9.00 AM and 3.30 PM feed was dipped in water then the birds handily force fed till their esophagi were filled. The actually feed consumed by the birds was recorded.

At 77th days old 5 birds from each treatment were randomly selected, weighed and slaughtered. Feathers were manually removed. Carcass were eviscerated and weighed. The abdominal and liver were immediately and individually weighed. The weight of abdominal fat and liver were expressed as a percentage of live weight.

Blood sample from each duck was taken during slaughter. Serum total protein, albumin, cholesterol, alkaline phosphates, transaminase: glutamic oxaloacetic transaminase (GOT) and glutamic pyruvic transaminase (GPT), uric acid.urea and creatinine were colorimetrically estimated using commercial kits (Purchased from Bio-Merievx { Morcyl Etiols Mierels Rains, France) . The globulin values were obtained by subtracting the values of albumin from total protein corresponding values. Uric acid and creatinine also were determined in muscular tissue according to Allon (1980).

Data were statistically analyzed according to (SPSS, 1997); percentage data were transformed to arcsine before analyses. The following model was used :

$$X_{ijkl} = \mu + \alpha_i + \beta_j + Y_k + \alpha\beta_{ij} + \alpha Y_{ik} + \beta Y_{jk} + \alpha\beta Y_{ijk} + e_{ijkl}$$

Where:

X_{ijkl} = Observation μ = Overalimean α_i = the effect of sex β_j = the effect of feeding system Y_k = the effect of body weight $\alpha\beta_{ij}$ = interaction between sex and feeding system αY_{ik} = interaction between sex and body weight βY_{jk}=interaction between feeding system and body weight $\alpha\beta Y_{ijk}$= interaction between sex and feeding system and body weight e_{ijkl} = Random error.

RESULTS AND DISCUSSION

1- body weight, weight gain and feed efficiency:

Means values for body weight, weight gain and feed efficiency are shown in (table, 1). Male Pekin ducks were increased in final body weight and improved feed efficiency than females. While female ducks significantly

increased weight gain than males. These results agree with the findings of Isshak *et al.*, (1986); Hanafi *et al.*, (1991) and EL-Gendi (1994). They reported that, male Pekin ducks were significantly heavier than females in body weight.

Analysis of variance showed highly significant ($P < 0.001$) effects due to feeding system on final body weight and weight gain. Force feeding significantly increased the two mentioned traits (3121.2 and 1665.8 gm, respectively) than did feeding ad-lib. (2780.8 and 1322.3 gm) for body weight and weight gain, respectively. However, opposite result was observed in feed efficiency. Results obtained agree with those of (Pinchasov and Jensen, 1989) who stated that feed efficiency was reduced by force feeding, perhaps the stress of incubation or the availability of larger quantities of feed in the digestive tract at specific times, or both, accounted for the less-efficient utilization of feed for growth.

Highly significant ($p<0.001$) effect on final body weight and weight gain were found due to body weight. The heavier weight group increased significantly the final body weight (3155.5 gm) and weight gain (1499.8 gm) compared with those of the medium and light groups, respectively. The light weight ducks insignificantly improved feed efficiency (0.215) than those of heavy (0.220) and medium ones (0.250 gm gain / gm ration). This results agree with the findings of EL-Sayiad *et al.*, (1988) and inagreement with Auvergne *et al.*, (1991), who found that heavy weight and light weight Muscovy ducks had similar average weight gain.

2- Absolute and proportional weights of liver, carcass traits and abdominal fat:

Male ducks were superior than females in absolute and relative weights of total edible meat, carcass and giblets. However, females showed the higher averages of absolute and relative weights of liver and abdominal fat, the differences between sexes in abdominal fat was highly significant. The superiority of females liver weight may be attributed to the increase in liver fat, which was more, pronounced in females than males. These results agree with those reported by Isshak *et al.*, (1986); Farghaly and Asar (1988); EL-Gendi (1994) and EL-Husseiny *et al.*, (2001).

Force feeding significantly increased ($p< 0.001$) absolute and relative weights of liver, carcass traits (except the relative weight of giblets) and abdominal fat than did ad-lib. Feeding. These results may be attributed to the accumulation of lipids in liver, which was reflected as an increase in the energy intake of force fed birds compared with that fed ad-lib. The same findings and conclusion were reported by Nir *et al.*, (1974); EL-Medany *et al.*, (1990) and EL-Gendi (1994).

Significant ($p < 0.001$) differences among body weight studied were found in absolute and relative weights of liver, carcass traits (except the relative weights of total edible meat, carcass and giblets and abdominal fat. The previously mentioned absolute traits were improved heavy, medium and light body weight ducks, respectively.

Similar results were reported by Auvergne *et al.*, (1991) who stated that the heavier weight of Muscovy ducks had significantly increased liver, carcass and abdominal fat compared to the light ducks.

3- Serum protein fractions and cholesterol:

It was obviously from (Table 3) that; sex had highly significant ($p<0.001$) effect on serum total protein, globulin and A/G ratio. Female ducks had higher Serum total protein (3.76 gm/dl), albumin (1.50) and globulin (2.25 gm/dl) compared with those of males (3.20, 1.48 and 1.72 gm/dl, respectively). However males had significantly the higher value of A/G (0.86) the lower serum cholesterol (268.1 mg/dl) compared with females (0.66 and 274.6 mg/dl, respectively).

Significant effect on serum globulin and A/G ratio was found due to feeding system. Serum total protein (3.56), globulin (2.09 gm/dl) and cholesterol level (281.7 mg/dl) were increased as a result of force-feeding, the corresponding values for birds fed ad-lib. were 3.40,1.89gm/dl and 261.0 mg/dl, respectively). Pronounced increase in plasma total protein and cholesterol levels due to force feeding was also reported by Niespodziewanski (1971); Nir (1972) and EL-Gendi (1994).

Body weight had highly significant effect on serum protein fractions and cholesterol. Heavy body weight ducklings had significantly the highest averages of serum protein fractions and cholesterol followed by medium then by those of light body weight birds, respectively. Results obtained disagree with those reported by EL-Sayiad *et al.*, (1988) who stated that light ducks had significantly higher serum cholesterol level than heavy birds. The significant differences in serum total protein may be attributed to the genetic and non-genetic factors of each breed (Dowidar *et al.*, (1999) and Zaki, 2002).

4-serum and tissues uric acid and creatinine:

Results obtained in (table 4) showed that, males had insignificantly higher averages of serum (6.47 Vs 5.73 mg/dl), tissues uric acid (1.31 Vs 1.22 mg/ g) and significantly increased tissues creatinine (0.781 Vs 0.735 mg/g) than females. However female ducks had significantly higher average of serum creatinine only (0.499 Vs 0.314 mg/dl). Similar results were observed by EL-Gendi (1994). Plasma uric acid varies considerable under standard conditions and appears to be influenced by sex and Reproductive State, mostly not all.

Highly significant ($p < 0.001$) effects were observed in serum and tissues creatinine due to feeding system. Force-feeding recorded significantly the higher averages of serum and tissues creatinine when compared with that fed ad-libtum. Similar results were observed by Zhou *et al.*, (1990) and EL-Gendi (1994), who reported that in force feed ducks the concentrations of blood metabolic compounds containing nitrogen were markedly elevated.

Analysis of variance showed high significant ($p < 0.001$) effect due to body weight on serum uric acid, creatinine and tissues creatinine. Heavy birds were significantly higher than medium and light birds in serum uric acid (7.25 mg/dl) and tissues creatinine (1.060 mg/g). However, medium and light birds showed the highest averages of serum creatinine (0.479 mg/dl) and tissues uric acid (1.36 mg/g), respectively.

5-Serum alkaline phosphatase and transaminases:

Data obtained (Table 5) showed that, females were significantly higher in serum GOT and alkaline phosphatase (134.52 and 386.83U/l, respectively)

than males (96.08 U/l and 307.30 U/l, respectively), however no significant effect on serum GPT was found due to duckling's sex. Similar result was observed by EL-Gendi (1994).

Highly significant ($p<0.001$) effect on serum GOT only was found due to feeding system. Force-feeding increased serum GOT and GPT transaminases (136.79 and 67.92 U/L, respectively) when compared with feeding ad-libtum (93.81 and 40.69 U/L, respectively). While, ad-lib. feeding system increased serum alkaline phosphatase(360.67 u/l) than that did force feeding (333.47 u/l). Changes in transaminases may depends mainly on the rate of protein metabolism which may be a function of bird's age rather than any other factor (Guyton, 1981)

Analysis of variance showed significant effects due to body weight on serum GOT, GPT and alkaline phosphatase. Serum GOT and GPT transaminases increased in medium body weight ducklings (165.13 and 65.89 u/l, respectively). On the other hand, those of heavy body weight ducklings had the highest average of serum alkaline phosphatase (363.55 u/l) when compared with those of medium and light ducks, respectively. Changes in transaminases activity may depend mainly on the rate of protein metabolism, which may be a function of birds age (Samak,2001).The significant differences found in (SGOT and SGPT) levels estimated in this work reflected liver activity related with metabolic system and may be attributed to the genetic make-up of each breed(Dowidar *et al.*, 1999).

It could be concluded that, force feeding by fattening ration did improve the meat quality of both male and female. The liver weigh and carcass traits were improved as well by force feeding and fattening ration. The increase in liver weight, weight gain and carcass was accompanied by tremendous changes in the physiological and biological parameters.

Table(1): Least square means and standard error for initial and final body weight, body weight gain and feed efficiency as affected by studied factors.

Item	Initial body weight (gm)	Final body weight (gm)	Weight gain (gm)	Feed efficiency (gm gain/gm ration)
Sex:	***	NS	***	NS
Male	1467.4 ± 0.93 a	2953.6 ± 1.62	1486.2 ± 1.3 b	0.220 ± 0.02
Female	1446.5 ± 0.93 b	2948.4 ± 1.62	1501.9 ± 1.3 a	0.239 ± 0.02
Feeding ystem:	NS	***	***	NS
Force	1455.4 ± 0.93	3121.2 ± 1.62 a	1665.8 ± 1.37 a	0.244 ± 0.02
Ad-lib	1458.4 ± 0.93	2780.8 ± 1.62 b	1322.3 ± 1.37 b	0.215 ± 0.02
Body eight:	***	***	***	NS
Heavy	1655.7 ± 1.14 a	3155.5 ± 1.99 a	1499.8 ± 1.68 a	0.220 ± 0.019
Medium	1459.5 ± 1.14 b	2958.3 ± 1.99 b	1498.8 ± 1.68 b	0.250 ± 0.019
Light	1255.6 ± 1.14 c	2739.3 ± 1.99 c	1483.8 ± 1.68 c	0.215 ± 0.019

Table(2): Least square means and standard error for absolute and proportional weights of liver, carcass traits and abdominal fat as affected by studied factors.

Item	Liver weight		Total edible meat		Carcass weight		Giblet weight		Abdominal fat	
	(gm)	(%)	(gm)	(%)	(gm)	(%)	(gm)	(%)	(gm/kg)	(%)
Sex:	NS	NS	NS	NS	NS	NS	NS	NS	***	***
Male	58.10±0.4	5.34	2108 ± 85	71.4	1846 ± 71	62.5	262 ± 8	8.88	32.14±0.22 b	3.21
Female	59.10±0.4	5.38	2066 ± 85	70.0	1807 ± 71	61.3	258 ± 8	8.76	33.50±0.22 a	3.35
Feeding system:	***	***	***	**	***	**	***	NS	***	***
Force	72.80±0.47	5.53	2258 ± 85 a	72.3	1985 ± 71 a	63.6	273 ± 8 a	8.75	35.20±0.22 a	3.52
Ad-lib.	44.40±0.47	5.19	1933 ± 85 b	69.5	1692 ± 71 b	60.8	241 ± 8 b	8.65	30.45±0.22 b	3.05
Body weight:	***	***	***	NS	***	NS	***	NS	***	***
Heavy	69.40±0.58	5.36	2262 ± 87 a	71.7	1985 ± 73 a	62.9	277 ± 9 a	8.77	34.87±0.27 a	3.49
Medium	61.80±0.58	5.46	2098 ± 87 b	70.9	1837 ± 73 b	62.1	261 ± 9 b	8.82	33.25±0.27 b	3.33
Light	44.60±0.58	5.27	1929 ± 87 c	70.4	1685 ± 73 c	61.5	243 ± 9 c	8.87	30.35±0.27 c	3.04

Table (3): Least square means and standard error for serum protein fractions and cholesterol as affected by studied factors.

Item	Protein fractions (gm/dl)				Cholesterol (mg/dl)
	Total	Albumin	Globulin	A/G ratio	
Sex:	***	NS	***	***	NS
Male	3.20± 0.08 b	1.48± 0.04	1.72± 0.07 b	0.86± 0.06a	268.10± 9.12 b
Female	3.76± 0.08 a	1.50± 0.04	2.25± 0.07 a	0.66± 0.06b	274.60± 9.12 a
Feeding stem	NS	NS	*	**	NS
Force	3.56± 0.08	1.47± 0.04	2.09± 0.07 a	0.70± 0.06b	281.03± 9.12
Ad-lib	3.40± 0.08	1.51± 0.04	1.89± 0.07 b	0.80± 0.06a	261.67± 9.12
Body weight:	***	***	***	NS	***
Heavy	4.64± 0.1 a	1.85± 0.05 a	2.79± 0.09 a	0.66± 0.70	315.80±11.17 a
Medium	3.68± 0.1 b	1.44± 0.05 b	2.25±0.09 b	0.64± 0.70	284.70±11.17 a
Light	3.11± 0.1 c	1.18± 0.05 c	1.93± 0.09 c	0.61± 0.70	213.55±11.17 b

Table(4): Least square means and standard error for serum alkaline phosphatase and transaminases (GOT and GPT) as affected by studied factors.

Item	Alkaline Phosphatase (U/L)	GOT (U/L)	GPT (U/L)
Sex:	***	**	NS
Male	307.30±11.67 b	96.08± 10.04	47.09± 5.47
Female	386.83±11.67 a	134.52± 10.04	61.52± 5.47
Feeding system:	NS	***	NS
Force	333.47±11.67	136.79± 10.04	67.92± 5.47
Ad-lib.	360.67±11.67	93.81± 10.04	40.69± 5.47
Body weight:	*	***	*
Heavy	363.55±14.30	83.64± 12.30 b	51.45± 6.69 ab
Medium	358.75±14.30	165.13± 12.30 a	65.89± 6.69 a
Light	318.90±14.30	97.14± 12.30 b	45.58± 6.69 b

Table (5): Least square means and standard error for serum and tissues uric acid and creatinine as affected by studied factors.

Item	Uric acid		Creatinine	
	Serum (mg/dl)	Tissues (mg/g)	Serum (mg/dl)	Tissues (mg/g)
Sex:	NS	NS	**	***
Male	6.47± 0.30	1.31 ± 0.06	0.314 ± 0.029 b	0.781 ± 0.003 a
Female	5.73± 0.30	1.22 ± 0.06	0.499 ± 0.029 a	0.735 ± 0.003 b
Feeding stem:	NS	NS	***	***
Force	5.95± 0.30	1.22 ±0.06	0.452 ± 0.029 a	0.823 ± 0.003 a
Ad-lib.	6.25± 0.30	1.31 ± 0.06	0.310 ± 0.029 b	0.693 ± 0.003 b
Body weight:	***	NS	***	***
Heavy	7.25± 0.37 a	1.31 ± 0.08	0.399 ± 0.036 a	1.060 ± 0.004 a
Medium	5.47± 0.37 b	1.16 ± 0.08	0.479 ± 0.036 b	0.790 ± 0.004 b
Light	5.60± 0.37 b	1.36 ± 0.08	0.266 ± 0.036 c	0.423 ± 0.004 c

REFERENCES

Allon, G. (1980): Cited in applied biochemistry of clinical disorders. Book.

Auvergne, A.; Catherine, B. and Babile, R. (1991): Influence of protein and Methionine concentrations and body size on the growth and carcass of Muscovy ducks in the finishing stage of production. British Poult. Sci.32: 353-362.

Dowidar, Y. A.; Nofal, R.Y. and Afifi, Y.K. (1999): Carcass and serum biochemical traits of three local Egyptian chicken strains.Egypt.Poult.Sci. 19(III): 395-406.

EL-Gendi, G.M. (1994): Productive and metabolic responses to force feeding to improve meat quality of Pekin ducks of different ages and sex. Annals of Agric.Sc.,Moshtohor,Vol.32(1):229-241.

EL-Gendy E.A., and EL-Full A. Ensaf (1999): Breed and sex variations of duckling growth rate, carcass traits and meat chemical composition in response to breeding type.Egypt.Poult.Sci.Vol.19 (II): 325-349.

EL-Husseiny, O.M.; Abdallah, A.G. and EL-Baz, T.A. (2001): Performance of Muscovy ducks fed diets containing sesame seed meal or extruded full-fat soybean.Egupt.Poult. Sci.Vol.21 (IV): 901-920.

EL-Medany, N.; Karima, S.Mohamed; Shehata.M. and Afifi,M.A.(1990): Production of fatty liver in the local geese. Annals of Agric.Sci; Moshtohor 28(4); 2062-2072.

EL-Sayiad, G.A.A. (1990): Development waterfowl in the Egyptian village. Poultry Production Symposium in the Egyptian village on the beginning of the 21 Century.Fac. of Agri.,Tanta Univ. Kafr EL-Sheik,Egypt. PP 45-49 (in Arabic).

EL-Sayiad, G.A.; Marai, I.F. and Habeeb, A.A. (1988): Blood constituents in immature and mature light and heavy Pekin ducks.Egypt.Sci.8: 476-489.

Guyton, A.C. (1981): Text Book 1-Medical physiology.W.B.Saunders company (sixth edition), London.

Isshak, N.S.; Bedawy, N.; Saleh, K. and Asar, M.A. (1986): The effect of strain, sex, dietary energy and protein levels on the performance of ducks. Egypt. Poult. Sci.6: 33-47.

Kamer, G.A.E. (1962): Growth of various breeds of ducks under Egyptian conditions.Poult.Sci.41: 1344-1346.

Kamar, G.A.R. and Yamani, K.A. (1980): The development of duck test.Egypt.J.Anim.Prod.20.No.1: 31-39.

Marai, I.F.M.and Yamani, and K.A.O. (1974): Crammed and self-fed young Pekin drakes on maire for fatty liver and meat production in Egyot.Beitrage trap.Ianndwirtsch.Vet.22, 367.

Niespodziewanski, M. (1971): Cholesterol, its fraction and total protein serum, glucose in blood and hoematocrit value of geese fattened for fat livers.Nutr.Abst.Rev.43: 764.

Nir,L.(1972): Modification of blood plasma components as related to the degree hepatic steatasis in the forced fed geese.Poult.Sci.51: 2044-2049.

Nir, L., Shapira, N., Nitsan, Z.and Dror, Y. (1974): Force feeding effects on growth, carcass and blood composition in young chicks.Br.J.Nutr.32: 229-239.

Pinchasov,Y.and Jensem, L.s. (1989): Effect of force _ feeding at an early age on body growth and composition of chicks . Poult . Sci ; 68 :1727_ 1729

Pingel, H., (1990): Genetics of growth and meat production in waterfowl. P: 691-704, in: Poultry Breeding and Genetics, edited by R.D.Crawford.Elsevier Science Publishers B.V., Amsterdam, The Netherlands.

Samak, H.R.A.(2001):Evaluating and improving the productive performance in some local chickins.Ph.d. Thesis.Fac. of Agric. Benha Univ.

Singh, R. A.; Aggarwal, C. K.; Gupta, S.C. and Pal, R.N. (1976): Effect of three system of housing, feed efficiency and survivability of White Pekin Ducks. Haryuna Agric.Univ.J.of Res., 6(314): 225-228.

SPSS for windows, Release 8.00 (22 Dec. 1997). SPSS inc., 1989.

Swatland, H.J., (1980): Development of carcass shape in Pekin and Muscovy ducks. Poultry Sci.59: 1773-1776.

Wang, Z.S.; Liu, M.X.and Li, K.Y (1981): The development of the boody and the digestive organ of Pekin ducks under under different feeding levels. Chinese Journal of Animal Sci.5: 11-12.

West, E.S.; Wibert, E.T.; Manson, H.A. and Bruggen, J.V. (1968): Textbook of Biochemistry .The mucmillan, Comp.New York, London.

Yamani, K.A.O. (1964): Development changes in body organs, glands and tissues of duck.M.Sc.Thesis, Faculty of Agriculture, Cairo University.

Yamani, K.A.O.; Marai, I.F.M. and Losoncy, S. (1973): developmental changes in serum proteins, lipids and cholesterol during the course of force feeding in geese, Ann. Biol.Anim.Bioch.Biophys. 13.215.

Yamani, K.A.O. (1990): Article on Ducks production in Egypt. Second Conference on Rabbit production and genetic in the Mediterranean area.

Zhou, Z.X.; Isshiki, Y.; Yamauchi, K. and Nakahiro, Y. (1989): Effect of feeding method and feed intake on the feed digestibility and activities of digestive enzymes in the feces of ducks. Japanese Poult.Sci.26: 354-361.

Zhou, Z.X.; Isshiki, Y.; Yamauchi, K. and Nakahiro, Y. (1990): Effects of force feeding and dietary cereals on gastrointestinal size, intestinal absorptive ability and endogenous nitrogen in ducks.British.Poult. Sci.31: 307-317.

Zaki, T.G. (2002): Survey of thyroid activity in poultry.M.Sc.Thesis, Fac. of Agric. Benha University

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تأثير الجنس ونظام التغذية ووزن الجسم على بعض الصفات الإنتاجية والفسيولوجية في البط البكيني

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كلية الزراعة بمشتهر – جامعة الزقازيق
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اجري هذا البحث بمزرعة الدواجن بقسم الإنتاج الحيواني – كلية الزراعة بمشتهر – جامعة الزقازيق – فرع بنها حيث استخدم في هذه الدراسة ٧٢ من بداري البط البكيني عمر ٥٦ يوم ، قسمت إلى مجموعتين (٣٦ ذكر و ٣٦ أنثي) قسمت طيور كلا الجنسين إلى مجموعتين تبعا لنظام التغذية (تغذية اجبارية و تغذية حتى الشبع) لمدة ٢١ يوم ، كما قسمت طيور كلا المجموعتين السابقتين إلى ثلاث مجموعات تبعا لوزن الجسم (ثقيلة ومتوسطة وخفيفة) وتهدف هذه الدراسة إلى تقييم الاستجابة الإنتاجية والتمثيلية للجنس والتغذية الإجبارية لفترة قصيرة ووزن الجسم في البط البكيني. أظهرت النتائج الآتي:

فوقت الذكور عن الإناث في وزن الجسم وكفاءة تحويل الغذاء. كان للتغذية الإجبارية تأثيرا معنويا علي زيادة وزن الجسم والزيادة المكتسبة في وزن الجسم. كانت طيور المجموعة الثقيلة الأكثر تفوقا في وزن الجسم والزيادة المكتسبة في وزن الجسم.

فوقت الإناث معنويا في الوزن المطلق والنسبي لدهن البطن (٣٣,٥ جم و ٣,٣٥% مقابل ٣٢,١ جم و ٣,٢١% علي الترتيب). كان للتغذية الإجبارية تأثيرا معنويا في زيادة الوزن المطلق والوزن النسبي للكبد وصفات الذبيحة ودهن البطن. أظهرت طيور المجموعة الثقيلة في وزن الجسم زيادة معنوية في الوزن المطلق للكبد وصفات الذبيحة ودهن البطن.

أظهرت الإناث زيادة معنوية في محتوي السيرم من البروتينات الكلية والألبيومين والجلوبيولين. كان للتغذية الإجبارية تأثيرا معنويا في زيادة محتوي السيرم من البروتينات الكلية (٣,٥٦ جم / ديسيلتر) الجلوبيولين (٢,٠٩ جم / ديسيلتر) والكولينسترول (٢٨١,٠ ملجم / ديسيلتر) مقارنة بالتغذية حتى الشبع (٣,٤٠ ، ١,٨٩ جم / ديسيلتر و ٢٦١,٧ ملجم / ديسيلتر علي الترتيب) ، بينما كان للتغذية حتى الشبع تأثيرا معنويا في زيادة النسبة بين الألبيومين والجلوبيولين. تفوقت طيور المجموعة الثقيلة في وزن الجسم في محتوي السيرم من البروتينات الكلية والألبيومين والجلوبيولين والكولينسترول.

أبدت الذكور زيادة معنوية في كرياتينين الانسجة (٠,٧٨١ ملجم / جم) مقارنة بالإناث (٠,٧٣٥ ملجم / جم) بينما تفوقت الاناث معنويا في محتوي السيرم من الكرياتينين (٠,٤٩٨٩ ملجم / ديسيلتر) عن الذكور (٠,٣١٤ ملجم / ديسيلتر). سجلت التغذية الإجبارية أعلي قيم معنوية لمحتوي السيرم والأنسجة من الكرياتينين. تفوقت طيور المجموعة الثقيلة في وزن الجسم معنويا في محتوي السيرم من حمض البوليك ومحتوي الأنسجة من الكرياتينين. بينما كانت الطيور المتوسطة في وزن الجسم الأعلى معنويا في محتوي السيرم من الكرياتينين.

تفوقت الإناث معنويا في محتوي السيرم من GOT وإنزيم الفوسفاتيز القاعدي. كان للتغذية الإجبارية تأثيرا معنويا في زيادة محتوي السيرم من GPT ، GOT . كانت الطيور المتوسطة في وزن الجسم الأعلى معنويا في محتوي السيرم من GPT و GOT ، وفي المقابل سجلت المجموعة الثقيلة في وزن الجسم أعلي متوسط لمحتوي السيرم من إنزيم الفوسفاتيز القاعدي.