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الدور الذي تلعبه بعض الهرمونات الببتدية على معدل نمو الديوك الفيومي

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تناول البحث دراسة امكانية حقن بعض الهرمونات الببتدية في ذكور الدجـاج الفيومي مثل: البرولاكتين والفازوبرسين وهرموني نمو الدجاج والأغنام على معدل النمـو، التغيير في وزن الأعضاء والتحويل الغذائي•

وكانت نتائج البحث كالاتـي:

١ـ معدل الزيادة في وزن الجسم كان أقصى مايمكن في حالة الدجاج المحقـون بهرمون البرولاكتين من الاسبوع السادس حتى الحادي عشر•• وزن الدجاج المحقونبهرمون الفازوبرسين أعلى من المجموعه القياسية بادئا من الاسبوع التاسع حتى الحادي عشـر• ولوحظ أيضا أن متوسط أوزان الدجاج الفيومي المحقون بهرمون نمو الأغنام أقل من كـل المجموعات خلال فترة التجربـة•

٢ـ لوحظ أن أوزان الحوصلة والقانصة واللحم كانت أعلى في الدجاج المحقـون بالبرولاكتين في حين لم يتأثر وزن الريش أما الدجاج المحقون بهرمون نمو الاغنام كان له أعلى أوزان في الريش والقلب والعظم الى جانب عرض القصبة• بينما زادت أوزان المعدة الحقيقية والامعاء بجانب وزن الكبد والغده النخامية في الدجاج المحقونبهرمون نمو الدجـاج•

٣ـ أستهلك الدجاج المحقون بهرمون نمو الأغنام أكبر كمية من الغذاء خلال التجربـة مع أعلى نسبة تحويل غذائي بينما كانت أقل قيمة في حالة الدجاج المحقون بهرمـون الفازوبرسين• وأدى حقن البرولاكتين الى زيادة استهلاك الغذاء ومعدل النمو مع نسـبة تحويل غذائي مشابه للمجموعة القياسية•

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EFFECT OF SOME PEPTIDE HORMONES ON GROWTH RATE OF MALE FAYOUMI CHICKENS

(With 3 Tables)

By

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SUMMARY

The present study dealt with the possibility of inecting some peptide hormones into male chickens such as vasopressin, prolactin, poultry and ovine growth hormones, to study their effects on growth rate, changes in organ weights and food conversion.

The results obtained revealed that :

1- The maximal gain of body weight was obtained in case of chickens injected with prolactin from sixth week till the eleventh. The weight of chickens injected with vasopressin were heavier than control starting from the nineth week till the eleventh. The average body weight of chickens injected with ovine growth hormone was less than all groups.

2- Chickens injected with prolactin exhibited heavier weights of crop, gizzard and meat than control while feather weight was not affected. Clhickens injected with ovine growth hormone showed heavier wights of feather, heart and bone as well as wideth of tibia. Chickens injected with poultry growth hormone increased the weights of both proventriculus and intestine beside the weight of liver and pituitary gland.

3- Chickens injected with ovine growth hormone consumed greater amount of food with highest conversion ratio. While the lowest of this ratio was obtained in chickens treated with vasopressin. Administration of prolactin markedely increased food intake and body gain with a conversion ratio similar to control.

INTRODUCTION

The rate of growth of Fayoumi chickens as compared with other broiler breeds is relatively slow. Their meat has a desirable taste and they produce a suitable yield of egs with special flavour. They are also characterized by their high resistance to local diseases (ABD-EL MALAK, 1962).

Besides environmental and nutritional factors, the activities of the endocrine glands which regulate growth in poultry, play an important role. Several trials have been made to improve their rate of growh by endocrine manipulation but still as yet not achieved (SCANES et al., 1984). The administration of different types of hormones as thyroid active materials (SOLIMAN, 1961) and protein hormones as growth hormone (GH), aspecially those

of heterogenous origin are liable to loose their potency due to formation of antibodies on the long run (MYERS and PETERSON, 1974).

The other view in this respect would be to encourage increased secretion of endogenous homogenous growth homogenous of chicken, neutralize somatostatin which is inhibitor to growth hormone secretion (SIROSSER et al, 1980) or potentiate it to maximize growth rate.

The aim of the present study was to elucidate the action of disperced injections of peptide hormones such as vasopressin (VS), bovine prolactin (BPRL), poultry growth hormone (PGH) and ovine growth hormone (OGH) on the rate of growth and food conversion of male Fayoumi chickens. The changes in organs weight were also determined.

MATERIAL and METHODS

Fifty male chickens, 6 weeks old were used in this study. The chickens were divided into 5 groups of 10 cocks each. The chickens were free from internal and external parasites and common local diseases. All birds were fed a ration obtained from Egyptian Company for Poultry (Egypco). The chickens were treated as follows :

- The first group (control chickens): was injected subcutaneously with 0.2 ml of 2% egg albumin in saline, one injection weekly for six weeks.

- The second group : was injected subcutaneously with 0.1 ml of albumin solution containing 1.16 mg PGH, weekly for six weeks.

- The third group : was injected with 0.1 ml of egg albumin solution containing 0.05 mg OGH. weekly for six weeks.

- The fourth group : was injected subcutaneously with 2 ml of egg albumin solution containing 2.0 mg BPRL weekly for six weeks.

- The fifth group : was injected subcutaneously with 0.2 ml of albumin solution containing 0.05 units of VS, divided into 2 injections, at one hour interval weekly for six weeks.

- PGH was extracted according to SCANNES and FOLLETT (1972) and FARMER et al. (1974).

- BPRL and OGH were supplied from National Institute of Arthritis, Metabolism and digestive Diseases (U.S.A.).

- VS was supplied from Parke Davis and Co. Detroit, Michigan, U.S.A.

The chicken were weighed individually every week. This was carried out early before the morning food. The efficiency of food utilization/Kg gain in weight was determined.

At the end of the experiment, the birds of each group were weighed individually on empty stomach, and slaughtered. The crop, liver, heart, gizzard, spleen, testis, intestine, pituitaries and feathers were weighed. Meat was then separated from bones and each component was weighed separately.

Data were statistically analysed according to the methods described by DIXON and MASSAY (1957).

RESULTS

Maximal gain in body weight was recorded in case of chickens injected with PRL from the sixth till the eleventh week. In contrast, the average body weights of chickens injected with OGH was less than control and other experimental groups from the begining of the experiment till its end. The weights of control chickens were smaller than chickens injected with VS and PRL starting from the eighth week till the eleventh week (Table 1).

It is clear from table (2) that chickens injected with PRL have heavier weights of crop, gizzard and meat than control chickens. On the other hand, chickens injected with OGH exhibited higher weights of feather, heart, bone as well as width of tibia than control chickens.

Chickens injected with PGH increases the weight of both proventriculus and intestine beside the weight of liver and pituitary glands than control. The weights of spleen, testis and length of tibia were the same in all groups.

The results obtained in table (3) indicated that chickens treated with OGH consumed greater amount of food during the period of experiment which was significantly higher than that consumed by the control chickens with highest feed conversion ration (K = 5.2). Injection of PRL markedly increased food intake and body gain with a conversion ratio similar to the other grups.

DISCUSSION

Injection of vasopressin into growing Fayoumi chickens resulted in a significant increase in their rate of growth at the ages of 10 and 11 weeks. The amount of meat of those chickens was greater than that of control. The width of tibia and weight of feathers were also increased. This suggests that VS injection to chickens increased the release of GH (JOHN et al., 1974). The release of GH could not be attributed to its vasoconstrictor effect of blood supply of the pituitaries but it is possibly under control of adrenergic mechanisms (WILBER et al., 1971).

Administration of BPRL to chickens showed an increase in their body wights, this was characterized by increased weights of meat, crop and gizzard. The tibial width was also increased. Prolactin of various mammalian sources has a reputation for its growth promoting action of different types of birds (WADA et al., 1975). BATES et al. (1962) reported that in hypophysectomized pigeon, there is an evidence of synergism among prolactin and GH. They found that adequate doses of prolactin alone or together increased the weights of the body, liver, pancreas, intestines and kidneys.

Administration of PGH to growing Fayoumi chickens showed a delayed stimulating action to growth, which started to appear at the ages of 10 and 11 weeks. This increase in weights of chickens was characterized by a significant increase in weights of bones, alimentary tract and liver as well as pituitary gland. These results agree with NALBANDOV and CARD (1943).

Administration of OGH to growing chickens showed atendency for retarded rate of growth and increased food consumption per kg gain in body weight. The bone and meat content of the carcasses and liver weight were also increased. These results agree with those obtained by BATES et al. (1962).

It is thus suggested that this mild impairment or ineffectiveness of OGH in our intact Fayoumi chickens to promote growth is due to the formation of specific antibodies as a result of repeated injections of the heterogeogous hormone. This retarding effect of growth appeared later during the experiment. Previous studies in mammals and chicks revealed that antisera to growth hormone produced marked reduction in body weight gain (SCANES et al., 1984).

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Table (1): Effect of vosopression, prolactin, poultry and ovine growth hormones on growth rate of Fayoumi chickens (gm).

Age of chicken	Treatment				
(Weeks)	Control	Vasopressin	Prolactin	Poultry GH	Ovine Gh
6	441±09.7	429±11.3	445±07.0	420± 6.8	421±10.9
7	616±12.4	645±14.1	682±11.8*	568±12.7	580±13.7
8	738±14.9	770±17.7	818±15.5*	711± 7.4	692±17.2
9	854±12.2	931±20.9	998±19.8*	838±11.0	760±18.8
10	916±18.6	1029±23.3*	1088±13.5*	971±10.3	909±19.0
11	1030±06.2	1141±33.7*	1220±09.4*	1075±10.3	984±20.4

± Standard error. * Significantly differ from control of P< 0.01

Table (2): Efect of vasopressin, prolaclin, ovine and poultry growth hormones on the weight of organs of Fayoumi chickens (gm).

Name of organ	Control	Vasopressin	Prolaclin	Ovihe growh hormone	Poultry growth hormone
Feather	75.7±3.4	91.4±3.0	75.1±6.3	116.5±5.3a	91.5±2.5a
Crop	2.6±0.2	3.1±0.1a	3.5±0.2a	2.6±0.1	2.6±0.1
Heart	5.5±0.3	6.0±0.2	5.6±0.04	6.0±0.2	6.0±0.1
Gizzard	17.5±0.7	19.0±0.6	24.3±0.6a	19.8±0.5	22.0±0.6a
Liver	21.4±0.8	20.7±0.6	21.2±0.5	24.3±0.8a	26.0±0.8a
Spleen	2.2±0.2	2.0±0.1	2.9±0.1	2.7±0.1	2.9±0.1
Proventriculus + intestine	27.7±1.3	25.6±1.2	28.0±0.5	29.7±1.0	31.7±0.5a
Testes	6.5±0.6	3.4±0.9	6.4±1.3	7.4±1.1	8.7±0.4
Integumenis (Head Neck Wings legs)	213.6±6.9	213.3±4.8	219.8±14.7	239.3±4.9	220.4±4.7
Ptluitary gland mg/100 g B.W.	9.0±0.5	8.1±0.6	9.8±0.4	10.5±0.4a	11.9±0.6
Bone	136.8±4.9	125.0±3.8	145.7±2.8	179.3±1.6a	154.9±5.7
Meat	255.2±12.6	310.9±8.1a	330.0±1.8a	296.3±5.6a	278.3±5.3
Tibia Length	11.45±0.09	1130 ±0.09	11.32±0.08	11.97±0.06	11.7±0.11
Width (mm)	0.64±0.02	0.70±0.01a	0.71±0.01a	0.74±0.007a	0.71±0.01a

± Standard error a: Slignificatntly differ from control at P/ 0.01.

Table (3): Effect of peptide hormones on food consumption of Fayoumi chickens.

Group	Gain in body (Kg)	Food consumed (Kg)	Conversion ratio for B.W.
Control	0.589	2.585	4.3888
Vasopressin	0.712	2.767	3.8862
Prolactin	0.775	3.270	4.2193
Poultry GH	0.655	2.820	4.3053
Ovine GH	0.563	3.028	5.3783