بعض الصفات الإنتاجية والتناسلية في الأرانب النيوزيلندي الأبيض المصابة بالعمى الوليدى

محمود رياض محمود المهدي* و عاطف عبد الحي خليل سلمي**

* قسم الإنتاج الحيواني بكلية الزراعة بمشتهر جامعة الزقازيق فرع بنها
** قسم التوليد والتناسل والتلقيح الاصطناعي بكلية الطب البيطري بالزقازيق- جامعة الزقازيق .

استخدمت في هذه التجربة ٥٢ أرنب (تشتمل على ١٣ ذكر + ١٣ إنثى عادية و ١٣ ذكر + ١٣ إنثى مولودة عمياء(عمى وليدي) في عمر الفطام (٥ أسابيع) وزنت أسبوعيا حتى عمر ١٦ أسبوع وتم تقدير معدلات الزيادة اليومية ، الكميات المستهلكة من الغذاء يوميا ، معامل التحويل الغذائي من عمر الفطام وحتى عمر ١٢و١٦ أسبوعا وباستخدام البيانات السابقة تم حساب دليل الأداء و الكفاءة الاقتصادية وقيست أبعاد الجسم قبل الذبح مباشرة (عند عمر ١٦ أسبوع) وتم تقدير أبعاد وصفات الذبيحة كما درس أيضا النشاط الوظيفي للغدد التناسلية في الذكور والإناث العادية والعمياء وكانت النتائج كما يلى:

١-كان متوسط كمية الغذاء المستهلك يوميا والزيادة اليومية فى وزن الجسم و معامل التحويل الغذائي أقل بوجه عام فى الذكور والإناث العمياء بالمقارنة بالأفراد العادية بينما زادت قيم دليل الأداء والكفاءة الاقتصادية في الأفراد العمياء بالمقارنة بالأفراد العادية.

٢-انخفضت أبعاد الجسم قبل الذبح مباشرة للأفراد العمياء بالمقارنة بالعادية وكانت منخفضة بصفة خاصة في الإناث العمياء.

٣- كانت قيم وزن الخصيتين ، النشاط الحيمني للخصية وكذلك وزن البربخين في الذكور العمياء أقل بكثير عن مثيلاتها في الذكور المبصرة وكانت هذه الاختلافات غير معنوية للنشاط الوظيفي للغدد الذكرية ماعدا صفة Testis score كانت معنوية عند مستوى أقل من (٠,٠٥)

٤-كانت قيم وزن المبيضين وعدد الحويصلات التي شوهدت على السطح الخارجي للمبيضين وكذلك عدد الأجسام الصفراء المسجلة في الإناث العمياء أقل بالمقارنة بالأفراد المبصرة وكانت هذه الاختلافات معنوية عند مستوى أقل من (٠,٠٠١- ٠,٠٥) ماعدا صفة وزن المبيضين كانت غير معنوية .

٥-كانت قيم معامل الاعتماد لصفة وزن الجسم عند عمر ١٢ و ١٦ أسبوعا ومعدل النمو اليومي ومعامل التحويل للغذاء ودليل الأداء وكذلك الكفاءة الاقتصادية خلال الفترة من ١٢ - ١٦ أسبوعا على وزن الفطام كانت موجبة ومعنوية عند مستوى أقل من (٠,٠٠١ ، ٠,٠١). أما بالنسبة لصفة طول الذبيحة والعضد ومحيط منطقة Lumber ومعظم صفات الذبيحة التي تم دراستها على وزن الذبيحة الساخن كانت موجبة ومعنوية عند مستوى أقل من(٠,٠٠١-٠,٠١).

يستنتج من هذه الدراسة أن العمى الوليدي في الأرانب ترتب عليه نقص جزئي في معدلات النمو والنشاط الوظيفي للغدد التناسلية في الذكور والإناث العمياء وتعود ذلك إلى نشاط إفراز هرمون الميلاتونين كسبب رئيسي في هذا النقص .

EL-Mahdy, M. R. M. (1998). Evaluation of live body and carcass weight of broiler rabbits at marketing. *Egyptian Journal of Rabbit Science*, **8** (1): 69-81.

El-Sayaad, G. A. E., Mahdy, M. R. and Soliman, A. S. (1995). Atrichoje bracts as a food processing waste product in growing rabbit diets. *Egyptian Journal of Rabbit Science*, **5** (2): 125-133.

Gravis, C. J. (1978). Testicular involution after optic enucleation: Ultrastructure and alkaline phosphatase cytochemistry of the peritubular tissue. Am. J.Anat., **151**: 213 – 226 .

Krieger, D.T. (1973). Effect of ocular enucleatron and altered lighting regimens at various ages on the circadian periodicity of plasma corticosteroid levels in the rat. Endocrinol ., **93:** 1077-1093.

North, M. O. (1981). *Commercial Chicken Production*. Manual, 2nd Edition. Lib, of Congress, AVI Publishing Company INC, USA.

NRC(1977). National Research Council : Nutrient Requirements of Domestic Animals : Nutrient Requirements of rabbits. Washington D.C., USA.

Reiter, R. J., Sorrentino, S. , Ralph, L., Lynch, H., Mull, D. and Jarrow, E. (1971). Some endocrine effects of blinding and anosmia in adult male rats with observations on pineal melatonin. Endocrinol ., **88 :** 895-899.

SAS. (1996) SAS Procedure Guide. Version 6.12 Edition. SAS Institute INC., Cary, NC USA.

Selmi, A. (1988). Effect of photoperiod on the reproductive functions of the male . Ph.D. Thesis, Zagazig University, Egypt.

Selmi, A., Abd-El Ghaffar, A. E. and El-Sayed, A.T. (1998). Reproductive disorder, congenital abnormalities and chromosomal aberrations incidental to hypovitaminosis A in the rabbits. Proc. 10th Annual Congress of The Egyptian Soc. Anim. Reprod. Fertil. Giza-Egypt, pp. 243-257.

Sorrentino, S. and Schalch, D. S. (1970). Pineal regulation of growth hormone production and secretion in blinded and blinded anosmic rats . Anat. Rec., **166:** 382-388.

Table 4. Least square means(±SE) of functional activities of the reproductive gonads in normal and blind rabbits .

Measurements	Males		Females		Sig.	Regression coefficients on initial weight
	Normal	Blind	Normal	Blind		
No. of rabbits	13	13	13	13		
Testicular weight (gm)	2.63±0.19	2.36±0.19	-	-	NS	0.0002 ± 0.001^{NS}
Testis score	2.85 ± 0.22^{a}	2.23 ± 0.22^{b}	-	-	*	-0.0001 ± 0.001^{NS}
Epididymal weight (gm)	1.54±0.12	1.32±0.12	-	-	NS	0.0005 ± 0.001^{NS}
Ovarian weight (gm)	-	-	0.63±0.04	0.54±0.04	NS	-0.0001 ± 0.000^{NS}
No. of follicles	-	-	23.21 ± 0.67^{a}	18.18 ± 0.67^{b}	***	-0.0009 ± 0.003^{NS}
No. of corpora lutea	-	-	2.32 ± 0.12^{a}	1.91 ± 0.12^{b}	*	0.0011 ± 0.001^{NS}

***= p<0.001. * = p < 0.05 and NS = Not significant.
a and b = Values with different superscripts within each row, differ significantly (p < 0.001 or 0.05).

The increased performance index and economic efficiency recorded in the present study in blind rabbit may, however, be explained by that the blind rabbits were quiet and less active than normal ones. Therefore, increased performance index and economic efficiency may be due to increase of melatonin production in blind rabbits.

The obtained estimates of live body weight at 16 weeks of age and most of live and carcass measurements in the present study were nearly similar to the values of EL-Mahdy (1998) on the same breed at the same age, except that thigh length in live and carcass measurements which were more high.

Regarding weights of hot carcass, first retail cuts, edible offals and dressing percentage were lowest than reported by EL-Mahdy (1998).

It can be concluded that congenital blindness was associated with partial inhibition of body growth and the functional activities of the reproductive gonads were significantly altered. The performance index and economic efficiency were increased in blind rabbits. These findings may be mediated by increased melatonin production in blind rabbits.

REFERENCES

Blasco A., Ouhayoun, J. and Masoero, G. (1992). Status of rabbit meat and carcass: Criteria and terminology. Journal of Applied Rabbit Research, **15**: 775-786.

Dixit, V.R., Sharama, O. P. and Agrawal, M. (1977). The effect of light deprivation / blindness on testicular function of gerbil. 1 (Meiones hurrianae Jerdan) . Endokrinologie , **70** : 13-18 .

Duncan, D. B. (1955). Multiple range and multiple F-test. *Biometrics*, **11:** 1-42.

Table 3. Least square means(±SE) of carcass measurements and carcass traits in normal and blind rabbits .

Traits	Males		Females		Sig.	Regression coefficients on hot carcass
	Normal	Blind	Normal	Blind		
No. of rabbits	13	13	13	13		
Carcass measurements (cm):						
Carcass length	33.2± 0.4	33.1 ± 0.4	32.2 ± 0.4	33.1 ± 0.4	NS	0.003±0.001**
Humerus length	8.6 ± 0.2	8.4 ± 0.2	8.5 ± 0.2	8.6 ± 0.2	NS	0.002±0.000***
Loin length	10.0 ± 0.4	10.5 ± 0.4	9.9 ± 0.4	10.1 ± 04	NS	0.001 ± 0.001^{NS}
Thigh length	12.7 ± 0.3	12.4 ± 0.3	12.4 ± 0.3	12.8 ± 0.3	NS	0.001 ± 0.001^{NS}
Thigh circumference	17.4 ±0.6	18.9 ± 0.6	17.8 ± 0.6	17.2 ± 0.6	NS	0.003±0.001*
Lumber circumference	16.0 ± 0.3^{b}	17.0 ± 0.3^{a}	16.4 ± 0.3^{a}	15.9 ± 0.3^{b}	*	0.004±0.001***
Carcass traits:						
Hot carcass weight (gm)	966.0.46±57.25	997.30±55.32	963.67±55.41	962.17±57.95	NS	0.679±0.189**
Head weight (gm)	123.39±3.69	117.74±3.67	111.37±3.67	112.50±3.72	NS	0.050±0.009***
Fore legs weight (gm)	139.11±2.84	141.54±2.83	141.45±2.83	145.21±2.87	NS	0.141±0.007***
Thoracic cage weight (gm)	121.47±4.02	118.60±4.01	123.13±4.00	119.87±4.06	NS	0.099±0.009***
Loin weight (gm)	319.86±5.60	306.76±5.58	320.65±5.57	311.96±5.65	NS	0.378±0.013***
Hind legs weight (gm)	392.46±6.85	389.76±6.81	385.70±6.81	375.92±6.90	NS	0.363±0.016***
First retail cuts weight (gm)	849.36±9.04	840.47±8.99	847.82±8.99	832.74±9.12	NS	0.877±0.021***
Kidneys weight (gm)	18.22±0.89	19.20±0.89	20.40±0.89	17.54±0.90	NS	0.002±0.000***
Kidney fat weight (gm)	3.92±0.49	3.47±0.49	4.29±0.48	3.18±0.49	NS	0.005±0.001***
Heart weight (gm)	5.82±0.31	5.80±0.31	5.71±0.31	5.47±0.31	NS	0.005±0.001***
Liver weight (gm)	52.31±3.43	62.20±3.41	59.59±3.40	58.99±3.45	NS	0.005±0.001***
Spleen weight (gm)	1.12±0.09	1.22±0.09	1.11±0.09	1.37±0.09	NS	0.001±0.000***
Lungs and trachea weight (gm)	11.31±0.79	13.15±0.79	11.99±0.79	13.98±0.80	NS	0.001±0.000***
Meat/bone ratio	6.02±0.40	6.15±0.40	5.95±0.40	6.36±0.41	NS	0.003±0.001**
Dressing percentage	57.12±0.81	58.50±0.81	56.71±0.81	56.81±0.82	NS	0.011±0.002***
Edible offals weight (gm)	90.52±4.48	101.80±4.46	99.55±4.45	96.51±4.52	NS	0.087±0.010***
Non- edible offals weight (gm)	330.39±13.05	354.72±12.99	340.72±12.97	337.86±13.15	NS	0.358±0.030***
Gastrointestinal tract:						
Full weight (gm)	371.63±19.83	372.52±19.74	370.83±19.71	327.71±19.99	NS	0.096±0.046*
Empty weight (gm)	166.50±10.84	142.06±10.79	172.39±10.77	143.67±10.93	NS	-0.024 ± 0.025^{NS}
Contents weight (gm)	205.12±15.49	320.47±15.42	198.44±15.40	184.04±15.61	NS	0.119±0.036**

***= p<0.001, ** = p <0.01 * = p < 0.05 and NS = Not significant.

a and b = Values with different superscripts within each row, differ significantly ($p < 0.05$).

Results of regression coefficient of the most carcass traits studied on hot carcass weight were positive and significant ($p < 0.001$ or 0.01; Table 3).

Functional activities of the reproductive gonads:

The least squares means of testicular weight, testicular spermotogenic activity (testis score) and epididymal weight (Table 4) were lower in blind males (Group 2) than that in normal males (Group 1). However, the differences were not significant, except for testis score ($p < 0.05$).

The values of ovarian follicular activity, expressed as number of visible follicles and number of corpora lutea observed on the surface of both ovaries were significantly ($p<0.001$ or 0.05) lower in blind females (Group 4) than in normal females (Group 3). Ovarian weight show a similar trend, but the differences in this concern were not significant.

The regression coefficients of functional activities for the reproductive gonads on initial body weight, were very low and non significant.

DISCUSSION

For this reason, removal of eyes or of the olfactory bulbs (anosmia) alone had relatively little influence on endocrine and reproductive organs of adult male rats (Reiter *et al.*, 1971). Whereas, combination of both operations in the same individual had resulted in significant inhibitory effects. Moreover, anosmia was found to exaggerate the inhibitory effects of blindness on growth rate and reproductive organ development of immature male rats (Sorrentino and Schalch, 1970). This may explained, the relatively low productive trait (growth performance, pre-slaughter measurements and carcass characteristics) recorded in blind rabbits (Groups 2 and 4) which may be attributed to the inhibitory effect of blindness. Whereas, absence of significance may be explained by that the blind rabbits can measure the photic information within the context of total sensory information (tactile, auditory and olfactory) relative to environmental condition. Rabbits are known also as ractoral coprophagic animals. This may suggcot smaller role of optic roote in respecting will feed intake rate.

On the other hand, pineal melatonin was found to be involved in reduction of food consumption in blinded anosmic male rats because pinealectomy had reversed the condition (Reiter *et al.*, 1971). Melatonin has shown to alter the synthesis and release of growth hormone (Sorrentino and Schalch, 1970). Therefore, the inhibitory effects of blindness on growth performance, feed intake, pre-slaughter measurements, carcass characteristics and on functional activity of the reproductive gonads recorded in this study may be mediated by increased melatonin production in blind rabbits.

Table 2. Least square means(±SE) of live body measurements in normal and blind rabbits.

Measurements	Males		Females		Sig.	Regression coefficients on initial weight
	Normal	Blind	Normal	Blind		
No. of rabbits	13	13	13	13		
Fasting weight (gm)	2083.11±94.81	2064.49±91.60	2063.93±91.76	2055.78±95.97	NS	1.249±0.313***
Body length (cm)	34.01 ± 0.41	33.86±0.39	32.78 ± 0.39	33.58± 0.41	NS	0.004 ±0.001*
Heart girth (cm)	26.93 ± 0.62	26.56 ± 0.59	26.83 ± 0.60	27.38 ± 0.62	NS	0.004 ±0.002*
Pelvic girth (cm)	31.44 ± 0.73	29.64 ± 0.71	30.89 ± 0.71	30.79 ± 0.74	NS	0.005 ± 0.002*
Humerus length (cm)	9.87 ± 0.27	9.39 ± 0.26	9.27 ± 0.26	9.80 ± 0.27	NS	0.002 ± 0.001*
Thigh length (cm)	14.72 ± 0.36	14.01 ± 0.34	14.11 ±0.35	14.03 ± 0.36	NS	0.002 ± 0.001*
Lumber circumference (cm)	23.69 ± 0.75	23.55 ±0.73	23.35 ± 0.73	22.48 ± 0.76	NS	0.002 ± 0.002^{NS}

***= p<0.001, * = p < 0.05 and NS = Not significant.

The regression coefficients of live body measurements on initial weight were positive and significant (p < 0.001 or 0.05), except lumber circumference were non significant.

Carcass measurements:

Table 3 shows that carcass measurements were higher in male rabbits (Groups 1 and 2) than in normal females (Group 3). The differences were not significant, except for lumber circumference (P < 0.05).

Estimates of regression coefficient of carcass length, humerus length and lumber circumference on hot carcass weight were positive and significant (p < 0.001or 0.01; Table 3).

Carcass traits:

Results in Table 3 show that averages of most carcass traits were superior in normal (Groups 1 and 3) than in blind rabbits (Groups 2 and 4).

Average values of fore legs and dressing percentage were higher in blind than normal females, while loin, hind legs, first retial cuts showed the opposite trend.

Averages of hot carcass, lion, hind legs, first retial cuts were higher in normal than blind males, while fore legs and dressing percentage showed the opposite trend.

Regarding weights of non edible offals and empty gastrointestinal tract were higher in blind males and normal females (Groups 2 and 3) than in normal males and blind females (Groups 1 and 4).However, the differences were not significant.

Table 1. Least square means(±SE) of growth performance and economic efficiency in normal and blind rabbits.

Performance	Males		Females		Sig.	Regression coefficients on initial weight
	Normal	Blind	Normal	Blind		
No. of rabbits	13	13	13	13		
Live body weight (g):						
At 12 week	1399.59±68.67	1396.70±66.35	1394.19±66.47	1321.44±69.51	NS	0.802±0.227****
At 16 week	2098.94±91.56	2097.17±88.47	2096.34±88.62	2088.33±92.68	NS	1.330±0.302***
Daily weight gain (g) :						
Weaning–12weeks	17.13±1.40	17.07±1.35	17.02±1.36	15.35±1.42	NS	-0.004 ± 0.004^{NS}
12-16 weeks	25.10±1.57	25.02±1.52	25.08±1.52	26.77±1.59	NS	0.019±0.005***
Weaning-16 weeks	19.98±1.19	19.96±1.15	19.95±1.15	19.84±1.20	NS	0.004 ± 0.004^{NS}
Daily feed intake (gm) :						
Weaning–12weeks	112.65 ± 0.00^{a}	103.51 ± 0.00^{b}	96.40 ± 0.00^{c}	87.89 ± 0.00^{d}	***	-
12-16 weeks	129.11 ± 0.00^{a}	121.31 ± 0.00^{b}	120.85 ± 0.00^{c}	106.31 ± 0.00^{d}	***	-
Weaning-16 weeks	118.60 ± 0.00^{a}	110.00 ± 0.00^{b}	105.30 ± 0.00^{c}	94.60 ± 0.00^{d}	***	-
Feed conversion rate (kg feed/kg gain):						
Weaning–12weeks	7.46±0.55	6.29±0.53	6.16±0.53	6.07±0.56	NS	0.003 ± 0.002^{NS}
12-16 weeks	5.47±0.43	5.33±0.41	4.59±0.41	4.25±0.43	NS	-0.004±0.001**
Weaning-16 weeks	6.27±0.34	5.63±0.33	5.45±0.33	5.02±0.35	NS	-0.001 ± 0.001^{NS}
Performance index %:						
Weaning–12weeks	22.60±3.33	23.20±3.21	26.19±3.22	24.03±3.37	NS	0.009 ± 0.011^{NS}
12-16 weeks	40.52±4.37	44.81±4.22	44.23±4.23	56.28±4.42	NS	0.063±0.014***
Weaning-16 weeks	36.12±4.19	38.70±4.05	40.99±4.06	45.59±4.24	NS	0.035±0.014*
Economic efficiency:						
Weaning–12weeks	2.21±020	2.40±0.19	2.57±0.19	2.38±0.20	NS	-0.001 ± 0.001^{NS}
12-16 weeks	2.76 ± 0.20^{b}	2.99 ± 0.19^{b}	3.02 ± 0.19^{ab}	3.77 ± 0.20^{a}	***	0.002±0.001**
Weaning-16 weeks	2.43 ± 0.16^{b}	2.64 ± 0.16^{ab}	2.76 ± 0.16^{a}	3.07 ± 0.16^{a}	*	0.001 ± 0.001^{NS}

***= p<0.001, ** = p <0.01 * = p < 0.05 and NS = Not significant.

a, b, c and d = Values with different superscripts within each row, differ significantly (p <0.001 or 0.05).

RESULTS

Growth performance traits:

The least squares means in Table 1 showed that average weights at 12 and 16 weeks of age in blind male rabbits were higher than that of blind female rabbits. However, the differences among the four groups at each of the two ages, were not significant.

Averages of daily feed intake and feed conversion during the period from 12 to 16 weeks of age were higher in male rabbits than in female ones and the lowest value in feed conversion was recorded by blind females (Group 4). The differences among the four rabbit group in feed intake were significant ($P < 0.001$) as shown in Table 1. Results in Table 1 also show that normal males exhibited higher feed intake and feed conversion than blind ones, the same observation was obtain when considering females. Among rabbit groups blind females showed the highest mean for performance index (%) from 12 to 16 weeks of age. At the same time, normal males recorded the lowest mean for the same trait from weaning (5 weeks) to 12 weeks of age.

The differences between normal and blind rabbits in feed conversion and performance index (%), were not significant.

Average value of economic efficiency was lower in male rabbits than in female rabbits. The highest values of the same trait were in blind females during the period from weaning to 16 and from 12 to 16 weeks of age. The differences among the four groups during the two periods were significant ($P < 0.001$ or 0.05; Table 1).

Behavioural changes including hyperactivity and development of fighting phenomenon were recorded, especially in normal males. Whereas, female rabbits were almost quiet and blind females appeared inactive.

Results of regression coefficient of live body weights at 12 and 16 weeks of age, daily weight gain, feed conversion, performance index and economic efficiency form 12 to 16 weeks of age on initial body weight were positive and significant ($P < 0.001$ or 0.01)

The regression coefficients also showed that each increase of one gram in the initial weight over the average weight of the animals caused an increase of 0.8 and 1.33 gram in live body weight of rabbits at 12 and 16 weeks of age (Table 1).

Body measurements just before slaughtering:

Results in Table 2 show that least squares means of body measurements, in general for blind rabbits (Groups 2 and 4) were lower than in normal rabbits (Groups 1 and 3), but the differences among the four groups, were not significant.

Figure 1. Normal (A) and anophthalmic rabbits (B) at the breeding age.

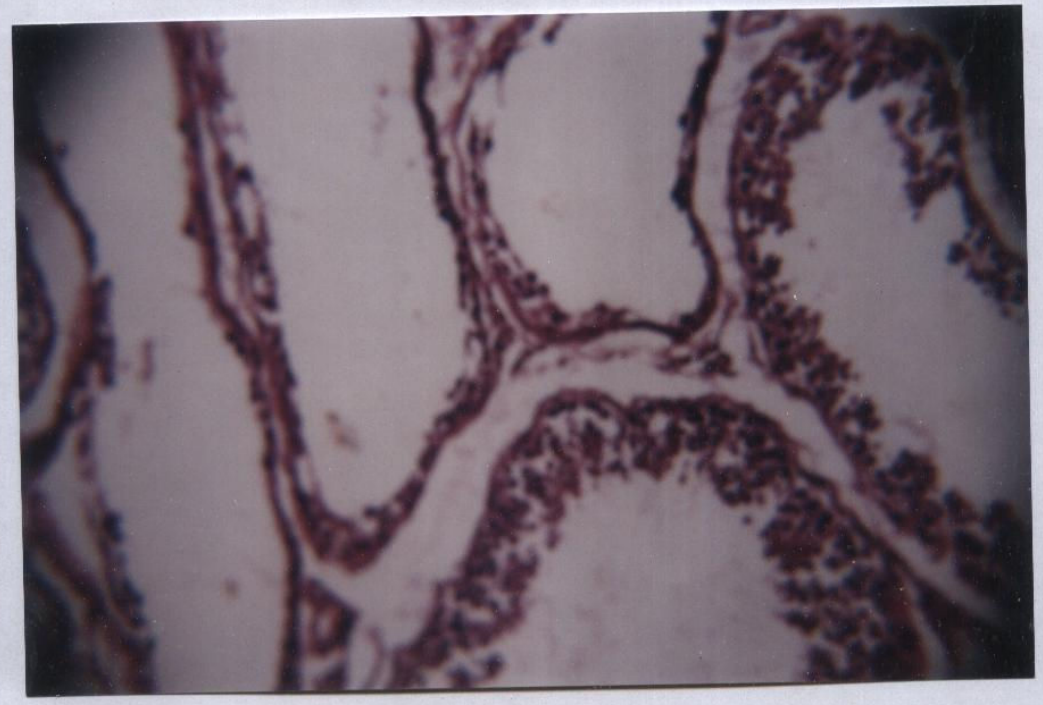

Figure 2. Cross section in testis representing various scores of the seminiferous tubules (0-5).

PI = (Live body weight in kilograms / Feed conversion rate) X 100.

Y = Price of gain / Price of feed intake.

The price of kilogram of live body weight was considered as 8 LE and that of kilogram of feed as 0.55 LE.

Rabbits were slaughtered at the 16th week of age after being fasted for 12 hours. Live body measurements were recorded immediately before slaughter. Data of live body, carcass measurements, hot carcass weight, first retail cuts weight, dressing percentage, weights of edible offals (liver, kidneys, heart, lungs, trachea and spleen weight) and non edible offals (skin, ears, feet and tail) in addition to meat/ bone ratio of hind leg were recorded according to Blasco *et al.* (1992).

Functional activities of male and female reproductive gonads were determined in normal and blinded rabbits. The testes and respective epididymis were dissected and weighed. Specimens from dorsal, central and ventral regions of the right testis were prepared for light microscopic examination to determine the spermatogenic activity of the testis. Scoring system consisted of rates from 5 to zero (Selmi, 1988) was used to evaluate the spermatogenic activity of the testis (Figure 2). Score 5 was given for seminiferous tubules contained 5 types of cellular association (spermatogonia, intermediate spermatogonia, spematocytes, spermatids and spermatozoa). However, score zero was given for tubules lined only with Sertoli's cells and / or basement membrane . One hundred cross sections of seminiferous tubules (30 from dorsal , 35 from central and 35 from the ventral regions of the testis) were randomly scanned for scoring. The mean value of testis score was then calculated for each group (normal or blind males). Evaluation of ovarian activity in normal and blind ones was carried out by estimations of females paired ovarian weight and number of visible follicles and / or corpora lutea detected on the surface of both ovaries by using magnifying lens.

Statistical analyses were performed using SAS program under windows (SAS,1996), according to the following models:

Live body weight, daily weight gain, feed conversion, performance index (%), economic efficiency, live body measurements, functional activities of reproductive gonads and hot carcass weight were analysed for the effects of rabbit group (as fixed) and initial weight (as a covariate) the reminder carcass traits were subjected to the statistical analyses by adopting a linear models including the effects of rabbit group and hot carcass weight as a covariate. Feed intake was analysed for the effect of rabbit group only. The significance of the differences between rabbit group means were tested by Duncan's Multiple Range test, Duncan (1955).

INTRODUCTION

Eyes in mammals are essential for perception of light and maintenance of circadian periodicity which is used to measure the photic information (Krieger, 1973). However, removal of eyes (blindiness) alters the photoperiodic control of reproduction in mammals (Dixit *et al.*, 1977) and leads to gonadal atrophy (Gravis, 1978). Moreover, blindness was associated with partial inhibition of body growth and retardation of reproductive organs (Sorrentino and Schalch, 1970).

Congenital blindness was previously recorded in NZW rabbits (Selmi *et al.*, 1998) and diagnosed as being due to congenital hypovitaminosis A. However, influence of blindness on rabbit performance was not reported so far. Therefore, the present study was undertaken to follow up the performance of congenitally blind rabbits regarding body weights, daily weight gain, daily feed intake, feed conversion, carcass traits and functional activities of the reproductive gonads, as well as, performance index and economic efficiency, in males and females.

MATERIAL AND METHODS

Syndromes of Congenitally blind male and female rabbits recorded in a rabbitry belonging to Faculty of Agriculture (Moshtohor), Zagazig University (Banha Branch), together with normal ones (concurrently born in the same time from the same parity at the same rabbitry) were separated after weaning at 5- weeks of age and divided into four equal groups (normal males, blind males, normal females and blind females, respectively). Each group of rabbits (n=13) was housed in flat-deck wire cages (3-5 rabbits per cage). The rabbits were kept in a well ventilated room with natural lighting condition.

A standard pelleted ration supplemented with vitamins and mineral premix (NRC, 1977) was provided daily at 9.00 h. The residual amounts of food were measured by weight back technique just prior to 9.00 h in the next day. Clean drinking water was freely available all times through automatic nipples. Urine and feaces were removed daily and the floor was periodically cleaned.

Live body weight was recorded at the beginning (i.e. at weaning of the study then at marketing (12-weeks-old) and at the breeding 16-weeks-old (Figure 1). The average daily gain was determined. The daily amount of feed intake (gm / day / rabbit) was calculated for each group. Feed conversion rate (gm feed / gm gain) was also determined. The performance index (PI) and economic efficiency (Y) were calculated according to North (1981) and El-Sayaad *et al.* (1995) as follows:

SOME PRODUCTIVE AND REPRODUCTIVE TRAITS IN CONGENITALLY BLIND NEW ZEALAND WHITE RABBITS.

M.R.M. EL-MAHDY* and A. SELMI**

* **Department of Animal Production, Faculty of Agriculture at Moshtohor, Zagazig University, Banha Branch, Egypt.**

** **Department of Theriogenology, Faculty of Veterinary Medicine, Zagazig University, Egypt.**

ABSTRACT

Four groups of New Zealand White (NZW) weanling rabbits (normal males, blind males, normal females and blind females), were used in the present study.

The results revealed that average daily feed intake, daily weight gain, feed conversion rate were, in general, lower in blind males and females (Groups 2 and 4) than in normal ones (Groups 1 and 3). Meanwhile, performance index and economic efficiency were higher in blind than in normal animals. Pre-slaughter measurements and carcass traits were largely dependent on each other and were lower in blind than in normal rabbits. However, blind females exhibited the lowest measurements.

The mean values of testicular weight, testicular spermatogenic activity (testes score) and epididymal weight were lower in blind than in normal males. The differences between the two groups were not significant for functional activities of male gonads, except for testis score (p 0.05). In females, the mean values of ovarian follicular activity (number of visible follicles) and number of corpora lutea observed on the surface of ovaries females were significantly (p 0.001 or 0.05) lower in blind than in normal females. Whereas, the ovarian weights of both groups were statistically not significant.

Estimates of regression coefficients of live body weight at 12 and 16 weeks of age, daily weight gain, feed conversion, performance index and economic efficiency from 12 to 16 weeks of age on initial body weight were positive and significant (p 0.001 or 0.01) and the regression coefficients of carcass length, humerus length, lumber circumference and the most of carcass traits studied on hot carcass weight were positive and significant (p 0.001 or 0.01).

It can be concluded that congenital blindness was associated with partial weakness of body growth, but the functional activities of the reproductive gonads were significantly altered. The performance index and economic efficiency were increased in blind rabbits. These findings may be mediated by increased melatonin production in blind rabbits.

Key words: New Zealand White rabbits, congenital blindness, growth performance, carcass traits and reproductive traits.

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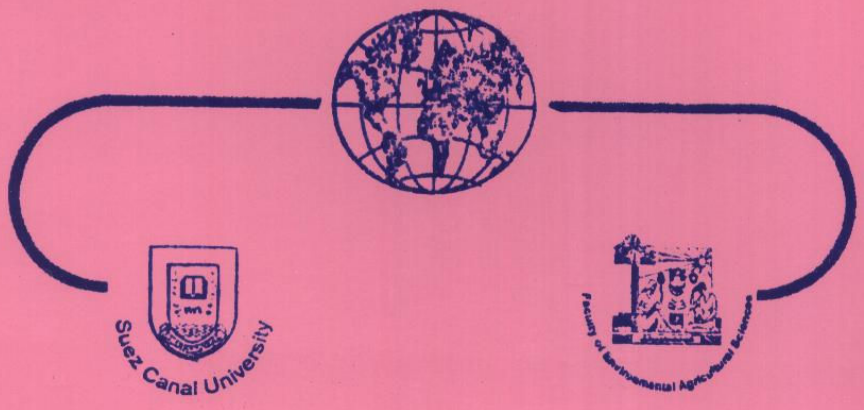

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