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A STUDY ON SOME PRODUCTIVE AND REPRODUCTIVE TRAITS ON EGYPTIAN SHEEP IMPLANTED WITH ZERANOL

(With 5 Tables)

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(Received at 13/3/1996)

زرع الزيرانول وتأثيره على بعض الصفات الانتاجيه والتناسليه للأغنام المصريه

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لدراسة تأثير مادة الزيرانول على بعض الصفات الأنتاجيه والتناسليه كانت الحملان المتاحه للتجربه ٤٢ حولى وحوليه تتراوح أعمارهم بين ٤ – ٥ شهر وأوزانهم ١٨ – ٢٠ كجم قسمت الى أربع مجاميع حسب الجنس والأوزان وتم زرع الزيرانول (١٢ مجم) كل ٤٥ يوم حتى وصلت الأناث الى ٣٤ كجم والذكور الى ٤٠ كجم عند هذا الوزن كانت نهاية التجربه لمجاميع المعامله والمقارنه لكلا الجنسين. تم ذبح ٣ ذكور من كل مجموعه ، وكانت الذكور المعامله أسرع نموا ووصلت لوزن التسويق (٤٠ كجم) مبكرا بحوالى ٢٨ يوما ، وكانت الكفاءه التحويليه أفضل معنويا أيضا هذا بالأضافه لتحسين ملحوظ فى بعض صفات الذبيحه خاصة نسبة التصافى ونسبة البروتين فى اللحم. ومن ناحية آخرى كانت الأناث المعامله أسرع نموا ووصلت لوزن التلقيح (٣٤ كجم) مبكرا بحوالى (٥٥ يوما) بل وكانت نسبة الخصوبه أفضل فى هذا العمر المبكر (٧٠٪) عن حوليات المقارنه (٦ر ٦٦٪). فالزيرانول حسن كثيرا من سرعة النمو فى كلا الجنسين مما كان له الأثر الجيد فى توفير العليقه والوقت والحصول على نسبة خصوبه جيده وعند عمر مبكر عن مجموعة المقارنه.

SUMMARY

to study the effect of zeranol on some productive and reproductive traits, a total of 42 Ossimi sheep of 16-18 kg. initial weight were divided into two groups balanced according to weight and sex, with or without zeranol implant (12 mg). Animals were weighted monthly and body measurements were recorded. Three male sheep were slaughtered from each group.

Conception rate was recorded for females. The treatment groups had a rapid growth ($p < 0.01$) and a significant higher ($P < 0.05$), body length, body leight and width at hooks than control group. Carcass quality was better with zeranol implant. Coneption rate was higher ($p < 0.1$) and at earlier age in the treated ewe lambs with Zeranol than non implanted ones.

Keywords: growth, carcass, concepton, Zeranol, sheep.

INTRODUCTON

Ralgro implant is a commercial name of Zeranol derived from a mold produced on corn by the organism, Gibberella zeae, discovered by chance and isolated by *STOB et al., (1962).* The active ingredient is Zeranol an anabolic agent not a hormone *(ENSMINGER et al., (1990).*

NICHOLS and LESPERANCE (1973) reported that steers implanted with Zeranol had improved growth performance compared with non implanting steers. *WHEREAS, LAMM et al., (1980)* observed that implanting bull calves with Zeranol had little effect on performance during pre-weaning growth period.

Zeranol has been used to promote growth, in sheep lambs *(WILSON et al., 1972., WILSON and BURDETTE 1973 and COOPER 1981)* giving improvements in daily gain between 1.3 up to 16%. Zeranol has also been used as an implant in beef heifers retained for breeding *(HENSON 1970).*

The previous study by *MOUSA (1991)* showed the slower growth rates for Ossimi ewe lambs is behind the low result of conception rate of ewe lambs at one year of age. Our experiment was conducted to investigate the possibility of using Zeranol to increase growth rate in local Ossimi lambs and hence to increase their chance for breeding successfully as ewe lambs at relatively early age. Also to study its effect on carcass quality of ram lambs.

MATERIALS and METHODS

The experiment was conducted at one big breeder called Koriem Farm which located in Mallawi district, Upper Egypt. Forty two Ossimi lambs around 4.5 month of age. were divided into 4 groups, two groups of ram lambs had a similar in weight as well as, two groups of ewe lambs were similar weights. the two treated groups from two sexes were implanted of 12 mg. of Zeranol in the mid of the left ear and reimplanted with 12 mg. of Zeranol every 45 day period until the ram lambs reached 40 kg., and ewe

lambs reached to the optimal breading weight (34 kg.). During this period animals were fed on pelted concentrate mixture. This ration containing 14.5% CP., 3% EE., and 16% CF. Animals were fed according to weight and their physiological stage. Berssem (T. alexandrinum) was offered in amount that represented 505 of the straw portion (on DM basis) according to *A.R.C. (1982)* requirements. Lambs were kept in closed houses with good ventilation and illumination. Water was available at any time. The animals were weighted monthly in the early morning. Body measurements (body length, body height, chest girth, body depth and width at hooks) were recorded. Dry matter intake (DMI) were calculated. Samples of the diet were taken periodically through the trail and dry at 60°C for chemical analysis *(A.O.A.C. 1984)*. At 40 kg. of live body weight 3 ram lambs from each group was slaughtered to study carcass prformance of treated and untreated groups which was dtermined in the laboratory of faculty of Agric., Minia Univ., by the total dissection of the right half of the carcass and the whole tracts. At 34 kg. of live body weight of ewe lambs conception rates (No. of ewes conceived /100 ewes join) were calculated after joining ewe lambs with young fertile rams for a period of 45 day.

Procedure of GLM (General liner model)., *SAS program* were used for staistical analysis.

RESULTS

Table (1) indicates that treated ewe lambs with Zeranol reached to 34 kg. at earlier age than control group (305 d. vs. 360d.), as well as, treated ram lambs reached to 40 kg at earlier age than non treatment group. (294d. vs. 322 d.). At the same time, feed conversion rate were better ($p < 0.05$) for the treatment lambs than control ones.

Body length, body height and width at hook were higher significant ($P < 0.05$) values in treated group than untreated ones (table 2).

Least square means and standard error of carcass traits for treated and control groups of ram lambs studied shows in table (3). Little differences were found between groups in, fore quarter (%) and hind quarter (%). However, dressing percentages had significant difference between treated group and control group (47.6 vs. 49.9). Results indicated that treated group had a higher values of boneless meat % and lower value ($P< 0.05$) of total dissect fat than control group.

Least square means of the 9, 10 and 11 ribs cut constituents and its chemical composition. Longissimus dorsi area (cm2) and its fat thickness, Dissected fat percentage, bone weight (gm.) are shown in table (3) and (4)

fat percentage and fat thickness over longissimus dorsi were siqnificantly higher ($p< 0.05$) for control group. While treated group showed higher values ($P< 0.05$) for protein percentage and longissimus doris area (cm2) than control group.

Treated ewe lambs showed a higher conception rate at earlier (55 d.) age than control group (table. 5).

DISCUSSION

The rapid growth rates of either treated males or females with better feed conversion rations than control group, may be due to, that zeranol increased growth hormone. Our results are in agreement with many workers, *HALL et al., (1977)* reported that overall gains showed 20% advantage for implanted lambs. Also *EL-HOMMOSI (1982)* stated that implanted lambs had higher final live body weight than the non implanted ones. Feed conversion ratios was higher for treated animals than others *(GREATHOUSE et al., 1983, KEANE and SHEIRNGHTON 1985 and FUMGALLII et al., 1989).* The results indicated that feed intake was insignificantly differ between treated and untreated groups. Moreover, the highly feed conversion for treatment than control groups was the direct result of the highly average daily gain obtained by Zeranol implantation. *STEEN (1985)* observed an improvement of 7.4% in feed conversion of Zeranol mpalnted steers, but this was combined by increase of 5.3% in daily feed intake. *FUGAMALL et al., (1989)* observed that animals implanted with Zeranol less than non implanted animals and feed conversion increased.

Table (2) presents body measurements for control and treated group. Body length, body height and width at hook were higher ($P < 0.05$) for treatment group than control. This may be due to the significant rapid growth obtained by implantation with Zeranol.

Fasting weight (kg), carcass weight (kg), fore quarter (%) and hind quarter (5) were slightlyer higher for treated group than control group (table 3). However, Fast dressing percentage calcuated as carcass weight including tail fat, kidney with fat and tests is divided by the fasting weight. It was the highest in treated group than control group, the differences were significant. Also empty dressing percentage was highly significant ($P < 0.01$) for treatment group than control group (60.2 vs. 56.8%). Results indicated that treatment group had a higher significantly values of boneless meat % and lower value of total dissected fat (kg) than control group, *SHARP and DYER (1971) and FUMAGALLI et al., (1989)* have shown that Zeranol produces a

greater percentage of protein and lower percentage of fat in carcasses of mplanted steers. It is surprising to find that, treated group had the highest body height and body length (table 2), as well as the highest boneless meat percentage, these results are confirmed the fact of the close association between bone skeletal and muscles growth *(ENSMINGER, 1987)* or may explain the great variation between males slaughter. Least squares means of the 9, 10 and 11 ribs cut constituents and its chemical composition, moreover longissimus dorsi area (cm2) and its fat thickness are presents in table (4). Dissected fat percentage, bone weight (gm), fat percentage and fat thickens over longissimus dorsi were significantly higher for control group than treated group. While treated group showed a higher values for protein percentage and longissimus dorsi area (cm2) than conttrol group. These resultts support the results mentioned earlir of the bonelss meat % which was higher and total dissected fat which was lower for tratment group than control group. These results are in agreement with *SHARP and DYER (1971) and FUMAGALLI et al., (1989).*

On the other hand, treated ewe lambs were significantly better performanc than control group and reached to mating weight at earlier age than control group (305d. vs. 360d). This may be due to the higher growth rate obtaind by implanting Zeranol. These results confirmed the fact of the close association between growth of body weight and development of reproductive organs. *FOSTER and OLSTEN (1985)* reported that ewe lambs grow at faster rate are more likely to conceive at younger age and heavier weight than lambs growing at slower rates. They have suggested that LH secretion may be impaired in retarded growth ewe lambs. It is worthy to note that, although the similar weights of ewe lamb group at mating and also, although the control group was older age at mating than treatment ewe lamb groups, but treatment ewe lambs was better conception rate than control group. Zeranol may be enhanced ovarian response to gonadotrophic stimulation. This findings are important in local ewe lambs management.

According to the data obtained in this study, the best daily gain feed conversion was obtained with Zeranol implantation. Moreover, body length, body hight, width at hooks were higher with implantation of Zeranol. Dressing percentage improved by Zeranol implantation. Any how ram lambs implants reached to market weight at early age and save time and ration. On the other hand, ewe lambs received implants improved conception rate at earlier age than control group. Additional studies are needed for use Zeranol on reproductive performance of ewes.

Table (1) : Effect of Zeranol on growth rate, feed intake (FI) and feed conversion:

Item	Males			Females		
	C.group	T.group	Sig	C.group	T.group	Sig
Initial BW Kg.	17.75 ± 0.94	18.05 ± 1.03		16.89±1.09	16.75±0.94	
Age (d.)	139.5 ± 12.3	141.61±15.22		140.5±13.5	142.4±11.3	
Final BW Kg.	39.54 ± 1.29	40.45 ± 1.4		34.28±1.1	24.22±1.49	
Age (d.) at finial BW.	322.29±11.3	294.38±12.5	*	360.6±28.5	305.2±19.5	**
ADG (gm.)	119.39±8.39	146.46±9.20	*	79.01±15.56	107.17±9.69	*
FI / day, gem DM	967.1 ±20.36	1011.6±5.42		691.33±15.56	831.64±19.63	
FC {gm.DM/gm.gain}	8.1 ± 0.95	6.90 ± 1.02	*	8.75±1.01	7.75 ±1.19	*

* = P< 0.05 ** = P< 0.01

Table (2): Effect of Zeranol on body measurements (cm).

Item	Control (C)			Treatment (T)	
	Males	Females	Sig	Males	Females
No. animal	8	12		9	13
Body length,					
Initial	48.39±1.53	51.88±1.32		50.40±1.45	49.73±1.39
Final	61.11±1.24	65.50±1.07	**	68.50±1.17	66.44±1.24
Body height,					
Initial	55.88±0.94	53.94±0.98		55.15±1.02	53.85±0.98
Final	60.88±1.41	60.11±1.63		62.30±1.54	60.67±1.63
Chest girth,					
Initial	47.08±0.92	44.89±1.06		45.80±1.01	45.27±0.96
Final	67.08±1.10	64.56±1.27	*	72.10±1.21	70.87±1.27
Chest depth,					
Initial	23.75±1.03	22.44±1.19		24.90±1.13	22.36±0.98
Final	33.79±0.63	32.39±0.72		34.00±0.69	33.33±0.72
Width at hooks					
Initial	3.08±0.17	3.78 ±0.18		3.40 ±0.17	2.96 ±0.16
Final	5.08±0.16	4.58 ±0.19		5.40 ±0.18	4.96 ±0.18

* = P < 0.05 ** = p < 0.01

Table (3): Effect of zeranol on carcass traits.

Item	Control	Treatment	S.E	Sig.
Fasting wt. kg.	39.8	40.0	1.05	
Carcass wt. kg.	19.3	20.5	0.77	
Fast dressing %	47.6	49.9	0.22	**
Empty dressing %	56.8	60.2	0.32	**
Boneless meat %	73.6	77.4	1.62	*
Fore quarter %	49.3	50.4	0.56	
Hind quarter %	50.7	49.6	0.96	*
Total fat wt. kg.	1.6	1.0	0.16	

* = P < 0.05 ** = P < 0.01

Table (4): Effect of zeranol on constituents and chemical composition (dry matter basis) of the ribs 9, 10 and 11 of the carcass and longissimus dorsi area (cm2), and fat thickness.

Item	Control	Treatment	S.E	Sig.
Total wt. of ribs, gm	370.25	364.34	8.25	
Lean meat, gm.	201.63	205.42	4.24	
Dissected fat, gm.	84.54	79.36	1.42	*
Bone wt., gm.	85.25	80.58	1.02	*
Chemical composition				
Moisture %	56.92	57.33	0.95	*
Protein %	36.56	39.20	0.52	*
Fat %	54.62	51.93	0.49	
Ash %	8.67	8.51	0.26	*
Fat thickness, cm	0.50	0.40	0.10	*
Area of long. dorsi, (cm2)	15.63	17.36	0.65	

* = P < 0.05 ** = P < 0.01

Table (5): Effect of zeranol on conception rate.

Item	Control	Treatment	Sig.
Weight (kg.) at mating	34.28±1.29	34.22±1.49	
Age (d.). at mating	360±28.5	305±19.5	**
Conception rate %	66.6	70.00	

* = P < 0.05 ** = P <0.01

ACKNOWLEDGMENT

This effort could not have been successful without the assistance of the Koriem Farm staff. We wish to thank the staff of Koriem farm for their understanding and cooperation in data collection. Special thanks to Mr. Ossam Koriem the owner.

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