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EFFECT OF TOTAL GLYCOALKALOIDS IN POTATO BY-PRODUCTS HAY ON :
2- NITROGEN UTILIZATION AND SEMEN EVLUATION IN RAHMANY RAMS .

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ABSTRACT

The present study aimed to investigate the effect of total glycoalkaloid (TGA) (solanine and chaconine) in potato by-products hay on nitrogen retention, semen production capacity using partial depletion of epididymis and cryoportectant ram sperm characteristics and incubation after thawing. Six rams with an average body weight of 70. kg and 3 years of age were used and assigned randomly into two similar groups. The supplemented feeding ratio was 50% concentrate feed mixture as main diet for two experimental ram groups and 50% of treatment rations (berssem hay, potato by-products hay). Berseem hay was supplemented as control group and second group was nourished offered to potato by-products hay (PB-PH). Nitrogen balance and nutrients digestability were determined for experimental groups and studying sperm characteristics which collected three consecutive ejaculates daily up to fourteen successive days using a warm artificial vagina with estrous ewe for mounting, liquid nitrogen for sperm incubation period through three hours was determined with post thawing spermatozoa. The obtained results indicated that the rams fed the ration contained PB-PH were significantly ($P<0.05$) lower in experimental testes (nitrogen retention, and thawing sperm characteristics during incubation time at 37^0C for 3 hours) than rams given BH ration . The overall means of total motile, normal and concentration number sperm / ejaculates $x10^9$ were 1.31, 1.47 and 1.75, with PB-PH ration while control group recorded 1.63,1.75 and 1.99,respectively during epididymis depletion. The PB-PH post-thawing sperm motility, live and normal were 43.00%, 40.30% and 44.00%,respectively. time at 37^0C for 3 hours) than control group. The incubation post-thawing sperm characteristics for deferent experimental rations and incubation time three hours were highly significant ($P<0.05$). The overall means of PB-PH treatment were 31.25%, 28.72% and 32.52% while, control were 39.38 , 33.88 and 40.26 for post-thawing motility, live and normal, during incubation respectively. Sperm characteristics decline through the incubation times because of lactic dehydrogenase (LDH), lactic acid and aromatic amino acid oxidase (AAAO) releasing gradually.

Keywords: Rams, digestion, nitrogen retention , and incubation times.

INTRODUCTION

In Egypt, many of variable quantities tons of agricultural wastes remain unused. One of the waste plants by-products available in Egypt potato by –products and potato vine which caused pollution. Potato vines residual, which remain after potato reaping. Make hay from potato by–products is a simple and appropriate method for conservation environment from pollution. Potato by–products hay can supply valuable ingredients to be used in animal rations, improve animal feed and tools enable to utilization at small-scale farmers at village level. At the same time decreasing feeding cost which is prime importance for livestock development in Egypt. El-Eman *et al.* (2001) found

that potato tops contain 11.36% crude protein, 51.22 % nitrogen free extract and 2.50 % ether extract. Moreover , Saleh *et al*. (2007) found that potato by-products hay contain 11.89 % crude protein,56.30% nitrogen free extract and 2.76 % ether extract. Also, recently study was described to estimate semen characteristics in ram according to Saleh *et al.* (2007) reported that semen volume (ml) 1.48 sperm motility % 80.50 and sperm cell concentration ($x10^9$) 2.86 for rams fed on PB-PH ration. Studying frequent semen collections are key factors in obtaining the maximum number of usable sperm per unit time. Hafez and Hafez (2000) showed that rams can be allowed to ejaculate many times a day for several weeks before depleting the epididymal sperm reserve.

The main objective of present study was to investigate the effect of feeding rams potato by-products hay (PB-PH) on nitrogen retention ,sperm thawing, sperm characteristics during incubation time at 37^0C for 3 hours.

MATERIALS AND METHODS

The present study was conduced at El-Serw Animal Production Research Station, Animal Production Research Institute, Agricultural Research Center Dokki , Egypt.

Experimental animals

Sexual mature Rhmany rams were used in this study. (average live body weight of 70 kg and about 3 years of age). All rams were healthy and free of diseases . The rams were divided randomly into two similar groups (three rams in each) according to body weight. Rams were housed individually in digestible cages, all digestion cages were kept under shade .

Feeding and management

The control ration contained 50 % concentrate feed mixtur (CFM)+50% berseem hay (BH) while another group fed 50 % CFM + 50 % PB-PH .rations were offered two times / day at 8 am and 3 pm and drinking fresh water was available daily. Feed intake and feces weight were recorded daily. Rams were given the experimental rations were according to the requirement of NRC (1990). The chemical analysis of experimental rations are presented in Table 1.

Potato by- products Hay making

Whole fresh green potato by- products (aerial parts in addition to small infirmity and greenish spots tubers) of *Solanum tuberosum* , were wilted by spreading under direct sun until complete drying , then packed in white bags

Feces and urine collection

The collection period was 7days following a two weeks as preliminary period feces samples were collected quantitively daily during the collection period , Also the urine was collected after diluted with 20 ml of conc. sulfuric acid to kept ammonia until nitrogen determination . Feed and feces were dried in a forced air oven , ground and kept for later analysis .

Nitrogen balance

Samples of feces and urine were collected daily up to seven successive days. Representatively, after collection feces samples were dried then, mixed and kept for chemical analysis. Nitrogen was determined in rations, feces and urine according to A.O. A.C.(21000) .

Blood samples

Blood samples were taken from all rams of each group from the jugular vein twice a week before morning feeding . Blood samples were divided two parts the first was to estimate red blood cells , white blood cells , hemoglobin and hematocrit and second part was centerifuged for 20 min. at 3000 rpm and then plasma separated and stored at-20°C till analysis.The plasma samples were used for the determinations .

Semen production capacity (SPC

Semen production capacity was conducted with partial depletion of epididymis after 54 days from feeding treatment rations. The technique of depleted epididymis was three consecutive ejaculates were collected daily from each ram throughout 14 successive days. The interval time between the daily frequent ejaculations was five minutes for each ram. Warm artificial vagina and estrous female served as mounts. Semen characteristics were determined as following: ejaculate volume (EV) was read from a gradual test tube, sperm concentration ($SCx10^9$) was estimated by haemocytometer count, morphology of normal spermatozoa (NS) was assessed by eosin and nigrosin staining and progressive motility (PM) of sperm was evaluated as soon as semen was collected.

Total number sperm / ejaculate $x10^9$

Total number sperm (TNS) = EV (ml) x ($SCx10^9$)
Motile spermatozoa = TNS x PM % x 0.01
Normal spermatozoa = TNS x NS % x 0.01.

Thawing sperm during Incubation time at 37^0C for 3 hours :

Three clean and dry test tubes (one tube for each treatment) placed in bath water at 37^0C and thawing extended semen from straws for control and PB-PS groups were poured in each tube and the incubation period for thawing sperm percentage characteristics (motility, live and normal) were stared and estimated at 0, 1, 2 and 3 hours.

Proximate analysis

Feces were collected daily in plastic bags from each ram and composed samples were prepared for chemical analysis .Feces and rations samples were analyzed according to A.O.A.C. (2000). Plasma biochemical analysis was done using Biomerieux reagent kits. Solanine was deterimined according to Carman *et al*. (1984) and Bushway and Bureau (1985) .Plasma samples were used for determination of total protein (Weichselbaum , 1989) , albumin (Doumas *et al*.,1971), globulin (calculated by difference) , urea (Patton and Crouch 1977), liver enzymes (Reitman and Frankle , 1957), total cholesterol Monnet,1983) creatinine (Bartiles,1971) and bilirubin(Elveback,1970 ,and Monnet , 1983).Whereas haemoglobin and haematocrit (Linne and Ringsrud ,1992),red and white blood cells(Miller and Weller , 1971) .

Statistical analysis :

Data were analyzed using the general linear model procedure of SAS (1996). least significant differences T test were calculated for the comparisons between treatments .

RESULTS AND DISCUSSION

Chemical composition of experimental rations and solanine

Chemical analysis of experimental rations and TGA residues are presented in Table 1.The results explained that TGA levels in PB-PH hay, diet, feces and urine were higher and the average daily were 80.19, 20.64 and 10.79 Mg / kg of PB-PH diet , feces and urine respectively .The increasing of TGA level in PB-PH is very danger indication because its accumulation in body and act as over load on kidney and liver and finally lead to ecumenical loss or death of animals .The results agreed with those of Alozie *et al* . (1979) . who observed inhibition of cholinesterase iso enzymes in vitro and in vivo by the potato - TGA . Gull *et al* .(1970) and Dalvi and Bowie (1983), reported that TGA is a toxic in Solanum tuberosum, it defects the protein digestibility and growth performance .Whereas Hansen (1985) found two fatal cases of potato poisoning. Swinyard and Chaube (1973). reported that PH-BH is teratogenic for animals , and Chaube and Swinyard (1976) they found that TGA in potato by-products more tratogenic and toxilogenic .

Table (1): Chemical analysis of experimental rations and solanine residues (% on DM basis)

Item, %	Experimental rations :						
	DM	OM	CP	CF	EE	Ash	NFE
PB-PH	89.41	89.72	11.89	17.55	2.86	10.28	57.42
CFM	90.13	89.70	14.88	13.40	3.10	10.30	58.32
Solanine, Mg / 100 gm							
Diets	8.19±0.07						
Feces	2.64± 0.03						
Urine	1.79 ± 0.83						

Feed intake

Data of the feed intake of group fed berseem hay as control or experimental group fed PB-PH are presented in Table 2 . The obtained results indicated that the rams fed the ration contained PB-PH was significantly (P<0.05) lower in dry matter intake compared to those received in control group and the values were 2730 and 2675 gm/h/d respectively .

Table (2) : Daily feed intake of rams fed on berseem hay and the potato by- products hay (on DM bases) .

Items	Diets	DM (g h / d)	DM g / kg
G 1	CFM	1500	21.43
	BH	1230	17.57
	Total	2730±6.33A	39.00±0.24
G2	CFM	1485	21.23
	PB-PH	1190	17.00
	Total	2675±8.65B	38.23±0.16

Means having different superscripts within the same column are significantly different at P<0.05 .

Nitrogen balance

Nitrogen balance results showed in Table 3. Indicated that dietary nitrogen balance(% N-balance of N intake) recorded was significantly (P<

0.05) higher with control group than PB-PH. The result was in agreement with the finding of Saleh *et al.* (2007).

Table (3) : Nitrogen balance of rams fed on potato by products hay.

Items	Control	PB-PH
DMI kg / day	2.46. B	2.38 A
Nitrogen intake gm/d	58.53A	49.61 B
NI mg / kg BW	836.00 A	709.00v
NI mg / kg BW75	2419.00 A	2050.00v
FN mg / kg BW	322.00 A	283.00 A
FN mg / kg BW75	1331.00 A	1169.00 B
UN mg / kg BW	346.00 A	304.00 B
UN mg / kg BW75	1017.00 B	1256.00A
Total NE mg / kg BW	668.00A	587.00 B
Total NE mg / kg BW75	2348.00B	2425.00 A
DN g / kg BW	57.86A	49.02 B
DN mg / kg BW75	2390.00 A	2026.00 B
NB mg / kg BW	585.00 A	496.00 B
NB mg / kg BW75	242.00 A	205.00 B
NB OF / NI %	28.41 A	21.96 B

Means having different superscripts within the same row are significantly different at P<0.05 .

Hematological picture

The blood parameters data are in Table 4 . Data indicate that group fed on PB-PH had significantly (P< 0.05) decreased RBC, hemoglobin, total protein, albumin, globulin and cholesterol, but significantly (P< 0.05) increased hematocrit ,liver enzymes(AST,ALT), urea , creatinine and bilirubin compared with control group the result in accordance with Dalvi (1985) . Comparative assessment of the effect of solanine administered on hepatic dysfunction in male rats was done by Harvey *et al* . (1986). On the other hand there are significant (p< 0.05) decrease in erythrocyte and leucocytes for PB-PH compared with control group. On the other hand the two fraction of white blood cells (neutrophile and lymphocyte %) and eiosinophile were significantly increased (p< 0.05) with PBPH group, as same time the monocyte was significantly decrease. This increases of lymphocyte and neutrophile for PB-PH group may be due to the increases of solanine level and the decreases of protein compared with and control group in addition to the solanine have an enhancement effect to the humeral immune response and increase white blood cells as reported by Pollman *et al*,(1980). and Saleh *et al* . (2007).

Digestibility coefficients

Digestibility coefficients and nutritive values of the experimental rations are shown in Table 5 . Digestion coefficients of DM , OM,CF, CP,EE, NFE , TDN and DCP for PH-BH were significantly lower than those of control ration .This is in agreement with Parfitt *et al*. (1982) and Azim *et al* . (1984) who reported that TGA affects the digestible protein .

Table (4):Blood picture of Rahmany rams fed potato by-products hay

Items	Control	PB-PH
RBCs (10^6 ul)	10.04 ± 0.18 A	8.58 ± 0.06B
Hemoglobin (g / dl)	9.56±0.18 ^{A}	8.22±0.16 ^{B}
Hematocrit (%)	23.87±0.10 ^{B}	35.7±0.28 ^{B}
Total protein (g / 100ml)	8.81±1.16^{A}	7.02±1.16 ^{B}
Albumin (g / 100 ml)	4.26±1.23^{A}	3.49±1.22 ^{B}
Globulin (g / 100 ml)	4.55±0.86 ^{A}	3.53±1.16 ^{B}
AST (u / ml)	36.00 ±2.58^{B}	64.00±3.12^{A}
ALT (u / ml)	31.00±3.02^{B}	37.00±1.46 ^{A}
T. cholesterol(mg/100ml)	84.00±3.23 ^{A}	56.79±4.61^{B}
Urea (mg/100ml)	21.40±2.05 ^{B}	28.11±1.58^{A}
Creatinine (mg/100 ml)	0.73±0.40 ^{B}	1.36±0.28 ^{A}
Bilirubin (mg / 100 ml)	0.34±0.04^{B}	0.72±0.02 ^{A}
WBCs (10^3 ul)	7.45 ± 0.17B	6.43±0.11 A
Lymphocyte (%)	55.8±2.6B	63.7±2.3 A
Neutrophile (%)	42.5±2.13B	57.9 ±1.8A
Eiosinophile (%)	5.2±0.3 B	6.9±0.1 A
Monocyte (%)	17.5 ±0.8 A	14.7±0.6B

Means having different superscripts within the same row are significantly different at P<0.05 .

Table (5): Digestibility coefficient and nutritive values of the experimental rations .

Digestibility coefficient %	Experimental rations	
	Control	**PB-PH**
DM	68.56±0.09A	65.04±0.02B
OM	69.34±1.13 A	66.28±1.04 B
CF	67.64±0.6B	63.19±1.21 A
CP	66.86±1.09 A	61.83±1.13 B
EE	62.88±0.57 A	60.3±0.9 B
NFE	66.94±0.66 A	61.6±1.37 B
TDN	65.78±0.69 A	60.21±0.6 B
DCP	11.25±0.4 A	10.03±0.26 B

Means having different superscripts within the same row are significantly different at P<0.05 .

Semen production capacity (SPC)

The effects of partial epididymis depletion and two rations on semen characteristics are presented in Table 6 The first ejaculate was explained higher significant (P<0.05) than second and third ejaculates. The differences between ejaculates could be attributed to the sexual desire of rams at time of collection, preparation of rams to semen collection and the epididymal reserves being on the verge of depletion. The apparent decline in semen quantity between first and third ejaculates may be due to a release of new generation of sperm in the process of spermatogenesis. These results agreed with those obtained by Foote (1974) who stated that because of the large epididymal reserves of sperm in rams, semen can be collected daily for a short period of time with a large number of sperm per ejaculate. Moreover, Awad (1998) reported that successive collection between first and third

ejaculates were highly significant differences in total ejaculates concentration, sperm motility and semen volume. However, date showed highly significant (P<0.05) in progressive movement sperm in second and third ejaculates rather than first ejaculate, this may due to high level of testosterone releasing during consecutive collection and ejaculation that active sperm progressive motility.

Table (6) : Sperm characteristics pro- and post freezing process and The composition of the TYF extender..

Variables	Experimental rations	Sperm characteristics		
		After extension	Equilibration period	After thawing
Motility(%)	Control	82.50±1.67 B	78.80±1.14B	48.00±1.98 B
	PB-PH	83.00±1.53 B	79.00±1.83 B	52.50±2.36 A
Live (%)	Control	88.00±1.23 A	85.50±1.65 A	44.00±1.44 B
	PB-PH	90.10±1.42 A	86.33±1.26 A	47.80±1.87 B
Normal(%)	Control	87.50±1.15 A	84.10±1.78 A	49.20±1.58 B
	PB-PH	86.00±1.45 A	83.53±1.14 A	51.50±2.93A
Components		Diluent A		Diluent B
Tris (g)		3.634		3.634
Citric acid (g)		1.99		1.99
Fructose (g)		1.25		1.25
Glycerol (ml)		----		12.00
Egg yolk (ml)		14.00		14.00
Antibiotic (ml)*		1.00		1.00
Distilled water		Up to 100 ml		Up to 100 ml

Means having different superscripts within the same column are significantly different at P<0.05 .

Such results are in agreement with those observed by El-Harairy *et al*.(2002) who found that progressive sperm motility was 83.50% when testosterone (ng /ml) level was 0.588 while, it was 84.40 % when testosterone level was1.095 in rams. Concerning the significant (P<0.05) effect difference on semen capacity with treatment rations ,the date observed that improvement results for control group than PB-PH group .The semen characteristics and capacity during consecutive ejaculates was depended on protein of ration .This component is important to spermatogenesis generation, increased large epididymal reserves of sperm and active accessory glands to secretion seminal plasma. Salem *et al.* (1992) found that there was positive correlation between the intracellular concentration and protein synthesis by ram spermatozoa. Moreover,Abdel-Khalek *et al.(*1999)reported that accessory glands, seminal vesicles and prostate gland are functionally affected by dietary protein source in Friesian bulls. The better sperm motility for control ration may be due to increasing testosterone level and blood calcium caused the activation of many enzymes necessary for maturation, metabolism, sperm motility and membrane properties of spermatozoa (Farage, *et al*., 1983 and Khalifa, 2005). Also, cholesterol component was played important role to synthesis testosterone hormone that essential to active spermatogenesis and transfers spermatozoa from testes to epididymis.

*Each 1.00 ml of antibiotic contained 7500 IU penicillin G procaine, 2500 IU penicillin G sodium and 12.5 mg streptomycin (as Sulphate).

Sperm freezability = sperm characteristics after thawing x 100
Initial sperm characteristics

Total number sperm / ejaculate x10^9

Consequently total number sperm/ejaculate x10^9 were calculated in Table 7.The control group was recorded greater results than PB-PH ration treatment.These may be due to the best semen characteristics was investigated with control ration. The overall means were explained that impossible to depilate rams epididymis after 42 ejaculates (3 frequent ejaculates daily through 14 days) of consecutive collection. If total motile semen was diluted 1semen: 8 extender, 0.5 ml insemination dose /ewe and motile sperm / dose 150x10^6 the control and PB-PH groups could be inseminated 129 and 103 ewes during 14 days when the artificial insemination was used liquid semen, respectively

Table (7): Total number of characteristics sperm per ejaculates x10^9.

Total sperm number per ejaculate x10^9	Frequent ejaculates	Treatment rations	
		Control	PB-PH
Motile sperm	First	1.81±0.04	1.46±0.21
	Second	1.91±0.03	1.40±0.20
	Third	1.18±0.03	1.07±0.09
Overall means		1.63±0.22^A	1.31±0.12^B
Normal sperm	First	2.10±0.17	1.72±0.62
	Second	1.95±0.24	1.63±0.54
	Third	1.19±0.11	1.07±0.08
Overall means		1.75±0.28^A	1.47±0.21^B
Sperm concentration	First	2.27±0.14	1.93±0.28
	Second	2.25±0.09	1.94±0.21
	Third	1.44±0.12	1.38±0.13
Overall means		1.99±0.28^A	1.75±0.19^B

Means having different superscripts within the same row are significantly different at P<0.05 .

Sperm freezability

Data in Table 8 showed that the influence of freezability process on sperm characteristics after extension, equilibration period and post- thawing are presented in Table 8. The date showed that extension semen characteristics recorded no significant differences in sperm characteristics pro-freezing process (after extension and after equilibration period at 5^{o}C) while, higher significantly (P<0.05) results were observed with control ration than PB-PH ration. The lowest sperm characteristics for PB-PH group than control group during freezability process may be due to decrease of protein level that is responsible for synthesis of spermatozoa, may simply bind reversibly to the cell membrane surface and causing rearrangement of the sperm cells membrane constituents, which cryoportectant agent freezing shock (*White et.al., 1980).* Moreover, the protection from freezing is due to cholesterol contained that emulsification in increases activity, interaction with the sperm membrane surface. Saleh *et al. (2007)* and Khalifa *et al.*(2006) reported that cholesterol (mg/100 ml) level in ram blood was 75.00 with P PB-PH treatment. Moreover, lipids are essential to support sperm cell membrane that increasing protection against freezing, those result is agree with El-Emam *et al.* (2001) who found that total lipids in Zaraibi goat bucks blood was 330 mg/100ml.

Table (8) : Means ± SE of Semen characteristics during epididymal depletion.

Semen characteristics	Frequent ejaculates	Treatment rations	
		Control	PB=PH
Semen volume (ml)	First	0.92±0.02	0.81±0.07
	Second	0.87±0.05	0.86±0.06
	Third	0.73±0.06	0.70±0.04
Overall means		0.84±0.04^{A}	0.79±0.02^{B}
Sperm motility (%)	First	80.00±0.83	75.80±0.49
	Second	85.50±0.45	77.80±0.47
	Third	82.75±0.56	78.10±0.69
Overall means		82.75±1.60^{A}	77.23±0.73^{B}
Normal sperm (%)	First	92.57±2.10	89.30±2.60
	Second	87.30±2.17	84.13±2.95
	Third	83.43±3.16	78.05±3.04
Overall means		87.77±2.68^{A}	83.83±3.28^{B}
Sperm concentration x10^{9}	First	2.46±0.11	2.37±0.14
	Second	2.57±0.13	2.25±0.10
	Third	1.98±0.15	1.81±0.12
Overall means		2.34±0.18^{A}	2.14±0.17^{B}

Means having different superscripts within the same row are significantly different at P<0.05 .

Thawing sperm during Incubation time at 37^{0}C for 3 hours

The overall mean percentages of motile, live and normal spermatozoa are presented in Table 9 Supplemented PB-PH to ram ration had a lower significant (P<0.05) effect on incubation post-thawing sperm characteristics rather control group however. Effect of incubation period at 37^{o}C for third hours on the sperm characteristics increased during the first hour while, with continuing incubation time up to 3 hours decreased (P<0.05). The apparent decline in incubated post-thawing sperm characteristics may be due to released lactic dehydrogenase (LDH) may reflect the breakdown cell membrane (Maxwell, 1978), production of free radical (Fridovich, 1981), increasing in lactic acid exerts from respiration motile spermatozoa (Zeidan, 1995) and released aromatic amino acid oxidase (AAAO) as toxic enzyme from dead spermatozoa(Marti et al., 2003 and Bag *et al*., 2004).

Economical efficiency :

This study cleared that use of potato by - products hay in ruminant feeding up to 50% of their requirements, it decreased feed costs by 28.41% compared to control group . These decreases in cost may be back to that potato by - products is cheaper by products,data are in agreement with Murdoch (1962).

Table (9) : Percentages of post spermatozoa during incubation at 37°C.

Parameters	Incubation time/ hours	Experimental diets	
		Control	PB-PH
Motility%	0	48.50±2.63	43.00±1.98
	1	43.00±2.31	35.50±2.83
	2	39.50±2.63	26.00±3.71
	3	26.50±2.24	20.50±3.92
Overall means		$39.38±4.76^{A}$	$31.25±5.08^{B}$
Live %	0	44.00±1.44	40.30±1.57
	1	38.13±1.32	33.33±1.68
	2	31.18±1.19	25.73±1.91
	3	22.19±2.11	15.53±1.45
Overall means		$33.88±4.78^{A}$	$28.72±5.59^{B}$
Normal %	0	49.50±1.58	44.00±1.93
	1	42.32±1.73	37.33±1.45
	2	37.87±2.10	28.45±2.11
	3	31.66±1.12	20.31±1.24
Overall means		$40.26±4.57^{A}$	$32.52±4.26^{B}$

Means having different superscripts within the same row are significantly different at P<0.05 .

CONCLUSION

These study indicated that potato by-products hay could be used in ruminant feeding at small -scale without inverse effect on semen characteristics as well as decreased waste pollution.

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تأثير القلويدات الكليه فى دريس مخلفات البطاطس على:
2- الاستفادة من الآزوت وتقييم السائل المنوى فى الكباش الرحمانى.

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تهدف الدراسةإلى تقييم تأثير القلويدات الكليه فى دريس عروش البطاطس على الميزان الآزوتى , كفاءة إنتاج السائل المنوى باستخدام التفريغ الجزئى للبربخ و قدرة خصائص السائل المنوى للكباش أثناء التحضين على درجة 37م 5 بعد الإسا له. إستخدمت 6 كباش رحمانى متوسط الوزن 70.35 كجم عند عمر 3 سنوات. و قسمت إلى مجموعتين , جميع الكباش المختبرةكانت فى حاله صحيه جيده حيث تمت تغذيتهم على 50 % علف مركز بالإضافة إلى 50% من الإضافات الغذائية المعاملة (دريس البرسيم - دريس مخلفات البطاطس) . قدم دريس البرسيم الى المجموعة الأولى (المقارنة)، وقدم الى المجموعة الثانية دريس مخلفات البطاطس . وأجريت التجارب لتقدير الميزان الآزوتى للغذاء المأكول,الروث والبول , اليوريا وحساب القيم الهضمية و القدرة على إنتاج السائل المنوى للمجموعتين و كانت طريقة إجراء القدرة على إنتاج السائل المنوى هى تجميع 3قذفات متتالية يومياً لمدة 14 يوما متتالية و استخدام النيتروجين السائل لتجميد السائل المنوى ، ولتقدير خصائص الحيوان المنوى بعد الإسا له استخدم التحضين. و قد أظهرت النتائج أن هناك فروق معنوية بين معاملة المقارنة ومعاملة دريس مخلفات البطاطس بمعنوية 05و% لجميع اختبارات التجربة حيث سجلت مجموعة المقارنة قيم اعلى (الميزان الآزوتى , كفاءة إنتاج السائل المنوى باستخدام التفريغ الجزئى للبربخ و قدرة خصائص السائل المنوى للكباش أثناء التحضين على درجة 37م 5 بعد الإسا له) وأن المتوسط العام لمجموعة دريس مخلفات البطاطس لعدد الحيوانات المنوية المتحركة % ، الطبيعية % ، التركيز 31و1 ، 47و1 ، 75و 1بينما كانت مع مجموعة المقارنة 1.63و 1.75 1.99على التوالى . و كان المتوسط العام لدريس مخلفات البطاطس لحركة الحيوان المنوى ، الحى ، الطبيعى بعد الإسا له 50 00و 43% ، 30و40% ،00و44% بينما كانت مع مجموعة المقارنة 48.0, 44.0 و 49.0 على التوالى. وكانت صفات السائل المنوى المسال أثناء التحضين لمجموعة دريس مخلفات البطاطس 25و31 ، 72و28 ، 52و32 لحركة الحيوانات المنوية والحى الطبيعى بينما كانت مع مجموعة المقارنة 39.38, 33.88و 40.26على التوالى. وبتقدم وقت التحضين يتم إفراز حمض اللأكتيك و إنزيم سام يفرز من الحيوانات المنوية الميتة فيؤدى

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