EFFECT OF FEEDING LEVEL ON GROWTH, NUTRIENT DIGESTIBILITY AND FEED EFICIENCY FOR BUFFALO CALVES

G . F . Shahin ; A . A . Zaki and H . M . Yousef

Animal Production Research Institute , Ministry of Agriculture, Dokki , Giza, Cairo.

SUMMARY

Fifteen buffalo calves weighing about 140 kg and aged 6 months were used in growth feeding trial. Animals were divided into three similar groups (5 in each) to examine three feeding level. In the first group, calves were fed ration (R1) contain concentrate feed mixture (CFM), corn grain (CG) and rice straw (RS) which represent 100% TDN and 100 % CP according to Kearl (1982) allowances recommendation. The second group, calves were fed ration (R2) contain CFM, CG, and RS as 100 % of TDN and 100 % CP for Shehata (1970) allowances, The third, calves were fed ration (R3) contain CFM, CG, and RS as 125 % of both TDN and CP for Shehata (1970) allowances .

The main results showed that DM digestibility in groups fed R1 and R3 allowances were higher ($P < 0.05$) than in group fed R2 allowances . That result supported by the higher OM, CP, CF, EE and NFE digestibility in R1 and R3 allowances which was not significantly higher than R2 allowances. DCP had the same trend than that of DM digestibility. TDN of Kearl's ration (R1) had the highest ($P < 0.05$) value as compared to others .

Final weight and average daily weight gain for Kearl (R1) and 125 % Shehata (R3) allowances were higher ($P< 0.05$) than Sheharta (R2) allowances . Daily DM intake was significantly affected by treatments. On the other hand, nutrient conversion as DMI kg / kg body weight gain had the highest ($P < 0.05$) value in the buffalo group fed (R3) , while TDN , and DCP kg / kg body weight gain of ration R2 had highly significant value than R 3 and R1 experimental allowances .

Sexual puberty and maturity age occurs earlier in calves fed based on R1 and R3 allowances than that of R2 allowances with similar body weight. The better economical efficiency of growing buffalo calves was obtained by 125 % Shehata allowances rations (R3) than others. There were no differences observed in the activities of some metabolic and kidney function enzymes .

It was concluded that feeding Kearl and 125 % Shehata allowances rations for buffalo calves had better allowances than those 100 % Shehata allowances rations.

Keywords : *Feeding level , buffalo calves , digestibility , blood parameters , puberty and performance.*

INTRODUCTION

Nutritional components especially energy, protein levels and allowances are the most important factors affecting body weight, age of puberty, age of maturity and growth rate at different age groups (Lee *et al.*, 1985a,b ; Deutscher *et al.*, 1986). Among the several axes suggested to develop buffalo productivity of the animal unit through genetic programs as will as optimization of feeding pattern and managerial practices (Baraghit *et al* ., 1999) .

Mudgal and Sivaiah , (1982) found that the digestibility of CF and NFE increased with the increased protein and energy level , while the digestibility of other major nutrients were not affected . Also, DM digestibility decreased with low protein level of NRC allowances (Baruah *et al* ., 1988).In the other hand, El- Shinnawy (1989) and Sharma *et al* ., (1993) found that the digestibility of DM , CP , CF , EE and NFE were not significantly affected by the different levels of CP and TDN intake from diet fed by buffalo calves .

Different levels of CP and TDN in the daily ration of buffalo calves have not significant effect on the daily body weight gain (Sharma and Singh, 1993) .In opposite, Mudgal and Sivaiah (1982) and Yanar *et al*., (2002) reported that average growth rate was significantly affected by the energy level content of the daily ration. Baruah *et al* ., 1988 found that the protein allowances of buffalo calves less than those suggested by NRC recommendation for beef cattle .

Feed conversion efficiency during the different phases of growth were not significantly affected by level of concentrate supplemention (Yanar *et al*.,2002).

Although, Pasierbski *et al*., (1991) concluded that feed conversion was significantly affected by feeding level.

It seems that scarce information exists about the utilization of diets with different levels of TDN and DCP (allowances) on reproductive and productive performance of buffaloes in Egypt.

The main purpose of this work was to study the effect of feeding buffalo calves based on the different allowances recommendation on the digestibility, growth, performance, metabolic status also age of puberty and maturity.

MATERIALS AND METHODS

This study was conducted at El-Gemiza Experimental Station Animal Production Research Institute, Agriculture Research Center, Ministry of Agriculture,

Egypt. Fifteen buffalo calves weighing about 140 kg aged 6 months were used in the feeding trial and divided into three similar groups (5 in each) to examine the effects of three feeding level (Table 1) allowances recommendation as follow :

1- Calves were fed ration (R1) contain concentrate feed mixture (CFM) , Corn grain (CG) and rice straw (RS) as 100 % of TDN and 100 % CP allowances as recommended by Kearl (1982) for buffalo calves .

2- Calves were fed ration (R2) contain CFM , CG and RS as 100 % of TDN and 100 % CP allowances as recommended by Shehata (1970) .

3- Calves were fed ration (R3) contain CFM, CG and RS as 125 % of both TDN and CP allowances as recommended by Shehata (1970).

Data of Table (I) showed that the allowances as recommended by Shehata (1970) was contained low of either TDN or CP as compared to those allowances as recommended by Kearl (1982) and as 125 % of both TDN and CP allowances as recommended by Shehata (1970) .

Daily feed allowances of calves were changed quantitatively on bi-weekly basis according to changes in body weight of calves. CFM and CG were offered twice daily at 8 a .m and 4 p.m, then RS was offered, Mineral blocks and fresh water were available freely throughout the experimental period.

Nutritive value of experimental rations (R1, R2 and R3) were calculated based on the results of three digestibility trials , which were carried out using acid insoluble ash (AIA) technique of Van

Table (1): Feed allowances as TDN (kg) and CP (g) to tested animals according to Kearl (1982) , Shehata (1970) and 125 % of Shehata recommendation based on animal live body weight {(ADG) 0.75 kg / h / d } .

Treatments	Body weight (Kg)	TDN kg/h/d	CP g / h / d	CFM * kg / h /d	CG** kg / h / d	RS*** kg / h / d
1	100	3.16	439	2.00	2.00	1.00
	150	4.24	609	3.00	2.25	1.50
	200	4.60	682	3.50	2.15	2.00
	250	4.93	732	4.00	1.75	3.00
	300	5.52	790	4.50	1.75	4.00
	350	6.11	826	5.50	1.75	4.00
	400	6.68	874	6.00	1.60	5.00
	450	7.24	896	7.00	1.00	6.00
	500	7.79	933	7.50	1.00	7.00
2	100	1.38	276	1.00	0.50	1.00
	150	2.07	311	1.50	0.75	1.50
	200	2.76	414	2.00	1.00	2.00
	250	3.45	518	2.75	1.00	3.00
	300	4.14	621	3.60	0.75	4.00
	350	4.83	725	4.20	0.75	5.00
	400	5.52	828	4.50	0.75	6.00
	450	6.21	931	5.50	0.75	7.00
	500	6.90	1035	6.50	0.75	7.00
3	100	1.73	345	1.00	1.00	1.00
	150	2.59	389	1.75	1.25	1.50
	200	3.45	518	2.50	1.50	2.00
	250	4.31	648	3.50	1.50	3.00
	300	5.17	776	4.50	1.25	4.00
	350	6.04	906	5.50	1.25	5.00
	400	6.90	1035	6.50	1.00	6.00
	450	7.76	1164	7.50	1.00	7.00
	500	8.63	1294	8.50	1.00	7.00

1 : Allowances of Kearl (1982)
2 : Allowances of Shehata (1970)
3 : 125 % allowances of Shehata

	% TDN	% CP
* Concentrate feed mixture (CFM)	65	16
** Corn grain (CG)	80	8
** Rice straw (RS)	30	2.5

Keulen and Young (1977). Chemical analysis of feeding stuffs and feces were carried out according to A.O.A. C. (1995) methods (Table, 2) .Blood samples were taken bi-weekly at 8 a.m before feeding from jugular vein of experimental calves using heparinized tube and blood plasma was separated by centrifugation at 3500 rpm , then stored at - 20 ^{0} C until analysis . Blood plasma globulin was obtained through subtracting albumin from total protein, creatinine and urea were measured by spectrophotometer using kits delivered from Sentinel, CH, Milano, Italy.

Statistical analysis was carried out after transforming the percentage number into Arcasin value , using F- Test (Snedecor and Cochran , 1982) and the differences among treatments means were tested using Duncan 's multiple range test (Duncan , 1955) .

RESULTS AND DISCUSSION

Data presented in Table (3) showed that the average total DM intake of buffalo calves were determined and recorded at different stages of the growth of the animals. While, total DM intake day kg / $w^{0.75}$ for (R 1) and (R 3) groups were higher significantly ($P < 0.05$) than those for (R2) groups.

TDN of R1 ration had the highest ($P< 0.05$) value than others , although TDN of ration R3 was higher ($P<0.05$) than R2. That results may be due to the increase level of TDN and DCP intake by Kearl (R1) and 125 % Shehata (R3) allowances . These results are in agreement with the findings of Pandit and Singh (1967), Helmy (1988), Bayoumi (1995) and Shalaby (2000) found that animal fed increase energy and protein levels in the concentrate feed mixture increased the DM intake kg / $w^{0.75}$, TDN and DCP intake.

On the other hand, Prasad and Pradhan (1990) and Sampath *et al.*, (1993), they found that the feed intake was not affected by concentrate level in crossed heifers and buffalo calves.

The digestion coefficient of DM was significantly ($P < 0.05$) higher in R1 andR3 than R2, but the difference between R 2 and R 3 rations was not significant. These results are in agreement with the findings of Baruah *et al.*, (1988). While, digestibility of OM, CP, EE, CF and NFE were slightly higher in R1 , and R3 than R2 allowances , the same trends were obtained by Mudgal and Sivaiah , (1982) ; Prasad and Pradhan , (1990) ; Sampath *et al.*, (1993) and Sharma *et al* ., (1993) who found that digestibility of CP , CF , EE , and NFE were not significantly affected by different level of TDN and CP intake in buffalo calves .

In addition, Steingass *et al.*, (1994) found that the nutrient digestibility decreased linearly with the increase of feeding level.

The results of buffalo calves performance are shown in Table (4). Final weight of calves which fed R1 and R3 ration were significantly ($P < 0.05$) higher than those of R2. Weight gain and average daily weight gain (ADG) of those fed Kearl's allowance (R1) and 125% Shehata allowance (R3) had higher ($P < 0.05$) value than Shehata allowance (R2) . The daily intake by calves of fed R2 ration is severely affected by the low TDN and CP of Shehata allowances and that the reflex effect as the (ADG) and different performance. The same trend was obtained by and Mudgal and Sivaiah , (1982); Dushkevich and Kilimar (1983); Marai *et al* ., (1983); Baruah *et al.*, (1988) ; Shin *et al* .,(1989); Hassan *et al.* (1995) and Yanar *et al.* (2002) .On the contrary , Afifi *et al.*, (1978); Metry (1988); Sampath *et al.* (1993) ;

Table (2) : Chemical composition of feeding stuffs and tested rations .

Item	DM	On DM basis					
		OM	CP	CF	EE	NFE	Ash
CFM*	85.88	91.08	16.56	9.73	2.90	60.09	9.91
Corn	88.50	89.00	9.1	2.50	2.73	83.67	2.00
Rice Straw	92.00	82.00	3.5	35.00	0.50	43.00	18.00
R1	87.66	88.83	12.67	15.33	2.33	58.5	11.17
R2	87.30	87.65	10.34	19.03	1.92	56.36	12.35
R3	88.86	88.89	12.37	15.32	2.27	58.93	11.11

The ingredients of concentrate feed mixture (CFM) were : 39 yellow corn , 29% undecorticated cottonseed meal , 14% rice bran , 9 % soybean meal , 5 % vines , 3 % limestone and 1 % salt .

Table (3) : Average DM intake, nutrient digestibility and nutritive values of tested rations .

Item	R1	R2	R3
Body weight , kg	321 ± 17.18	320.67 ± 15.23	325.33 ± 12.40
Daily DM intake :			
CFM kg / h / d	3.58[a] ± 0.33	2.76 ± 0.17	3.45 ± 0.23
Corn kg / h / d	2.18[a] ± 0.17	1.68 ± 0.00	2.11 ± 0.17
RS kg / h / d	5.82 ± 0.12	4.44 ± 0.15	5.61 ± 0.29
Total DM intake kg / h / d	11.58[a] ± 0.41	8.93[c] ± 0.07	11.17[b] ± 0.06
Total DM intake kg / $w^{0.75}$	0.153[a] ± 0.001	0.118[c] ± 0.005	0.146[b] ± 0.005
Digestion coefficients %			
DM	74.38[a] ± 0.50	70.75[c] ± 0.96	72.26[b] ± 0.64
OM	80.34 ± 1.30	76.88 ± 0.74	79.73 ± 0.98
CP	61.91 ± 0.89	59.36 ± 1.35	60.27 ± 0.65
CF	57.73 ± 1.13	55.82 ± 1.74	56.73 ± 1.80
EE	62.53 ± 0.81	59.11 ± 0.71	60.58 ± 1.23
NFE	78.48 ± 1.22	76.11 ± 2.44	77.23 ± 0.97
Nutritive values %			
TDN	71.94[a] ± 0.55	62.71[c] ± 0.40	69.73[b] ± 0.65
DCP	12.84[a] ± 0.49	9.67[c] ± 0.56	11.88[b] ± 0.86

a, b and c Means in the some row with different superscripts are different (P< 0.05)
R1 : Allowances of Kearl (1982)
R2 : Allowances of Shehata (1970)
R3 : 125 % allowances of Shehata -

Table (4) : Performance of buffalo calves fed the different experimental ration.

Item	R1	R2	R3
Initial body weight , kg	140.00 ± 10.82	141.00 ± 9.89	140.80 ± 14.40
Weight at 7 month	308.64^{a} ± 12.20	263.00^{b} ± 14.07	303.20^{a} ± 17.33
Final weight at 14 month	486.04^{a} ± 9.23	402.0^{b} ± 13.94	473.40^{a} ± 17.47
Weight gain, (kg)			
1st period 0 – 7 months	168.60^{a} ± 4.04	121.80^{c} ± 6.41	162.40^{b} ± 6.27
2nd period 7 – 14 months	177.40^{a} ± 0.57	139.00^{c} ± 1.22	170.20^{b} ± 2.40
Total period 0 – 14 month	346.00^{a} ± 5.06	260.80^{c} ± 5.93	332.60^{b} ± 6.82
Average daily weight gain kg / h /d :			
1st period 0 – 7 months	0.803^{a} ± 0.02	0.580^{c} ± 0.03	0.773^{b} ± 0.03
2nd period 7 – 14 months	0.845^{a} ± 0.01	0.662^{c} ± 0.01	0.811^{b} ± 0.01
Total period 0 – 14 months	0.824^{a} ± 0.01	0.621^{c} ± 0.01	0.792^{b} ± 0.02
Average DM intake kg / h / d :			
CFM	3.58	2.66	3.19
Corn	2.18	1.62	1.95
RS	5.82	4.31	5.18
Total	11.58	8.59	10.32
Feed conversion kg / kg gain :			
DM	14.05^{a}	13.83^{b}	13.03^{c}
TDN	10.11^{a}	8.67^{c}	9.09^{b}
DCP	1.81^{a}	1.34^{c}	1.55^{b}
Economic efficiency, LE/h /d:			
Gain value , LE^{1}	7.42	5.59	7.13
Feed cost , LE^{2}	5.69	4.23	5.08
Return , LE	1.73	1.36	2.05
Relative economic efficiency %	127.20	100	150.70

a, b and c Means in the some row with different superscripts are different (P< 0.05).
R1 : Allowances of Kearl (1982) R2 :Allowances of Shehata (1970) R3 :125 % allowances of Shehata
LE^{1}: on the basis of a price of 9.00 LE / kg gain
LE^{2}: on the basis of 0.90 LE / kg of CFM, a price of 1.00 LE/ kg of corn and a price of 0.05 LE / k RS

Table (5) : Puberty , maturity and some blood plasma parameters of growing buffalo calves as fed the different experimental ration.

Item	R1	R2	R3
Puberty :			
Age , day	404.0^{c}± 8.72	451.2^{a}± 7.14	423.6^{b}± 9.06
Weight , kg	282.2 ± 4.63	275.2 ± 3.98	277.0 ± 10.3
Maturity :			
Age , day	539.0^{c}± 9.30	581.2^{a}±7.21	545.0^{b}± 6.21
Weight , kg	387.4 ± 7.59	361.0 ± 7.96	369.0 ± 5.52
Blood plasma parameter :			
Total proteins , g / dl	6.15 ± 0.13	5.41 ± 0.24	5.94 ± 0.16
Albumin , g / dl	4.05 ± 0.14	4.14 ± 0.23	3.98 ± 0.11
Globulin , g / dl	3.11 ± 0.48	2.24 ± 0.33	2.74 ± 0.17
A / G ratio	1.43 ± 0.24	1.94 ± 0.01	1.61 ± 0.18
Urea mg / dl	50.74 ± 3.81	47.78 ± 3.53	50.39 ± 4.11
Creatinine , mmol / l	1.24 ± 0.14	1.34 ± 0.08	1.37 ± 0.07

a,b and c Means in the some row with different superscripts are different(P<0.05).
R1 : Allowances of Kearl (1982) R2 : Allowances of Shehata (1970)
R3 : 125 % allowances of Shehata -

Bayoumi (1995) and El-Ashry *et al* ., (2003) reported that there are no significant difference in growth rate of buffalos fed different protein and energy levels.

Nutrient conversion as given by DM kg / kg weight gain of ration R3 showed the highest ($P<0.05$) value. While as given as TDN and DCP kg / kg weight gain of ration R2 was the highest values. These results may be due to the higher level as of TDN and DCP intake by (R1) and (R3). The same trend was obtained by Marai *et al.*, (1983); Shin *et al.*, (1989); and Hassan *et al.*, (1995) who found that the feed conversion efficiency was significantly higher in animals fed the medium level than in those fed either the normal or high feeding level. Otherwise Pasierki *et al.*, 1991 and Yanar *et al.*, 2002 found that feed conversion efficiency during the different phases of growth were not significantly affected by the level of concentrate supplement.

Regarding, the values of economical efficiency were 1.73, 1.36 and 2.05 LE for R1 , R2 and R3 rations , respectively . This result showed that better economical efficiency was recorded for R1 and R3 as compared to R2 .The relative economic efficiency % was better in R3 and R1 .

Average age at puberty in experimental calves were 404 , 451.2 and 423 days in R1, R2 and R3 rations respectively , (Table 5) . It was observed that ration based on Kearl allowances (R1) decreased ($P < 0.05$) the age at puberty by about 12% as compared to Shehata allowances R2 .While , 125% from Shehata allowances (R3) decreased about 7 % of that Shehata allowances R2 . Sexual maturity occurred earlier by 42.2 and 36.2 days in calves of R1 and R3 groups than in R2. That difference was also statistically significant ($P< 0.05$).These results may be due to the higher level of TDN and DCP intake by (R1) and (R3) as compared to (R2) . These results are in agreement with the results obtained by Marai *et al* ., (1983) ; Lee *et al* ., (1985 a ,b) and Deutscher *et al* ., (1986) .

Ration based on Kearl allowances ration (R1) and 125 % of Shehata allowances (R3) were successful to reach similar body weight at puberty to that recorded for 100 % of Shehata allowances R2 (282.2, 277.0 and 275.2 kg, respectively) in shorter period of time (404, and 423 days for R1 and R3, respectively). These results are in agreement with the results obtained by Marai *et al.*, (1983); Lee *et al.*, (1985 a, b) and Deutscher *et al.*, (1986). They found that there was no significant difference between allowances (feeding level) in age, but not in body weight, at puberty. However, the average body weight at maturity of R1 and R3 groups had the same trend as the body weight at puberty .

Regarding , the blood plasma parameters (Table 5). Results indicated that no significant differences were observed among the different experimental animal groups concerning all blood plasma parameters tested. Moreover, buffalo calves fed the high feeding levels (R1) and (R3) groups showed higher total proteins , globulin and urea concentration compared with those for (R2) group , this came in line with values of CP intake in the experimental rations , values of intake and the results of OM and CP digestibilities . These results are in agreement with the results obtained by Hewett , (1972) ; O' Kelly, (1973) and Kumar *et al* ., (1980) who reported that there is a positive correlation between dietary protein and plasma protein concentration . Also , serum protein are considered a reliable index reflecting health and performance animal (O' Kelly, 1973) . El – Masry and Marai ,

(1991) related the variations in plasma proteins to the alteration in thyroid hormone level and in albumin or globulin concentrations . However, concentration of urea in the plasma is highly correlated with surplus crude protein intake and digestion (Holzer *et al* ., 1986). Also , serum creatinine concentration is a useful indicator of glomerular filtration (Ismail , 1999).Generally, all these parameters were within the normal range of buffaloes blood as reported by (Reece , 1991).

It could be concluded from this investigation that Kearl and 125 % of Shehata allowances for buffalo calves had successful effect than Shehata allowances. In addition using 125% of Shehata allowances of buffalo calves ration is suitable allowances with better economical efficiency and it had earlier age at puberty and at maturity.

REFERENCES

A. O. A. C. (1995) . Official Methods of Analysis 15 th ed. Association of Official Analytical Chemists. Washington , D . C., USA.

Afifi , Y. A. ; M . A. El-Ashry ; M.A. El-Fouly; A.K. Kirrella and I.A. Abou-Selim (1978) . The effect of different plants of nutrition on growth and reproductive performance of buffalo heifers . Agric. Res. Rev., 56:39.

Baraghit , G. A. ; M .M. Youssef , B. M . Ahmed ; S . S . Omar and O .M . EL-Malky (1999) . Effect of lasalocid supplementation on nutrients digestibility, rumen fermentation and performance of buffalo calves. Egyptian J. Nutr . and Feed 2 (Special Issue) 393 .

Bayoumi , H . M. (1995) . Productive and reproductive performance of Egyptian buffaloes as affected by feeding level during mid – pregnancy and early stage of lactation. M. Sc. Thesis , Fac.of Agric ., Moshtohor , Zagazig Univ . Banha Branch , Egypt .

Baruah , K . K .; S . K .Ranjhan and N . N . Pathak (1988). Feed intake , nutrient utilization and growth in male buffalo calves fed different levels of protein and energy. Buffalo Jor . 4 : 2 , 131.

Bertoni , G . ; S .Bartocci ; F . Piccioli – Cappelli ; A . Amici ; A . Borghese ; S. Failla and VL . Barile (1997) . Blood metabolites and hormone changes in lactating buffaloes fed diets different for energy content and protein degradability . Proceeding of the 5 th World Buffalo Congress , Royal Palace , Caserta , Italy , 13 – 16 October , PP . 961.

Deutscher , GH. ; LL. Zerfoss and DC. Clanton (1986) .Time of zeranol implantation on growth , reproduction and calving of beef heifers . Journal – of – Animal – Science. 62 : 4 , 875.

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

Dushkevich,VT and SE . Kilimar (1983) . Effect of feeding level on meat yield of Black pied cattle in an industrial farm. Zhivotnovodstvo. No. 9, 38 – 39.

El-Ashry , M.A. ; H.M. Khattab ; K. E. I. Etman and S. K Sayed (2003) . Effect of two different energy and protein levels on productive and reproductive performances of lactating buffaloes. Egyptian J. Nutrition and Feeds 6 (Special Issue) : 491.

El-Masry , K. A. and I . F. M. Marai (1991) .Comparison between Friesian and water buffaloes in growth rate , milk production and some blood constituents , during winter and summer condition of Egypt . Animal production, 53:38 .

El- Shinnawy, M .M. (1989). The efficiency of feeding buffalo calves

on low level of concentrate . Proceeding of the third Egyptian British conference on animals , fish , and poultry production , 7- 10 October 1989 , Alexandria , Egypt . Volume 2 , 571.

Hassan , HA . ; FMR . El- Feel ; NHA . Morsy and STM . Fahney (1995) . Effects of feeding level , season of calving and body weight on performance and carcass traits of Friesian – native calves . International – Journal – of Animal – Sciences. 10 : 1 , 85.

Helmy , G. H. (1988) . Studies on productive and reproductive traits of Egyptian buffalo as affected by steaming up and feeding in early stage of lactation . Ph. D. Thesis , Fac. of Agrc., Zagazig Univ.,Moshtohor , Banha Branch , Egypt Higazy , A (1985).The effect of some nutritional levels during different seasons on gestation and milk yield of buffalo heifers . Ph. D. Thesis, Fac. of Agrc., Al-Azhar Univ. Cairo .

Hewett , C . D. (1972) . The blood profile as a possible means of diagnosis non-infection in fertility and metabolic problems in dairy cows . Proc. 7 th int . Congr . on animal reproduction and artificial insemination Muchen . P . 107 .

Holzer ,Z.;D. Levy and V . Samuel (1986) . "Interactions between supplementary nitrogen source and ration energy density on performance and nitrogen utilization in growing and fattening male cattle "An . Prod. P. 19, Vol. 42

Ismail , A . A . M. (1999) . The use of non- hormonal growth enhances with different nutritional levels for growing Friesian calves until slaughter . M . Sc. Thesis . Department Anim. Prod. Fac. Agric. Ain Shams Univ. EGYPT.

Kearl, L . C. (1982). Nutrient requriements of ruminants in developing countries Inter. Feedstuffs Institute Utah State University, Logan , Utah 84322, USA

Kumar , N . ; U . B . Singh and D . N . Verma (1980) . Effect of different levels of dietary protein and energy on growth of male buffalo calves . Ind . J . Anim . Sci. 51 : 513 .

Lee , KS. ; KJ . Na and HS. Kim (1985 a) . Studies on developing new breed (composite) crossed with Korean native cattle and Charolais . 11 – Comparison of the growth rates and reproductive traits between Korean native cattle and Charolais crossbreed under different feeding regimes . Proceedings of the 3rd AAAP Animal Science Congress , May 6-10 , Vol . 1 , 339.

Lee , KS. ; KJ . Na ;HS. Kim and Cj. Yun (1985 b). Studies on developing new breed (composite) crossed with Korean native cattle and Charolais .11 – Comparison of the growth rates and reproductive traits between Korean native cattle and Charolais crossbreed under different feeding regimes . Korean – Journal – of – Animal – Sciences. 27 : 4 , 197.

Marai , IFM.; AAW . Abdel-Malek ; L . Bedeir and GH . Metry (1983) . Growth and reproductive perfprmance of Shorthorn crosses and native cattle as affected two levels of feeding . Beitrage – Zur – Tropischen –Landwirtschaft – and – Veterinarmedizin . 21 : 2 , 199 .

Metry , G .H . (1988). Studies on productive and reproductive traits of Egyptian buffalo as affected by steaming up and feeding in early stage of lactation . Ph. D. Thesis, Fac. of Agrc., Moshtohor ,Zagazig Univ., Egypt .

Mudgal , V. D . and K . Sivaiah (1982) . Effect of feeding different levels of

protein and energy on feed utilization and growth of buffalo calves . Indian Jou . of Dairy . Sci ., 35 : 2 , 138 .

O'Kelly, J .C. (1973) . Seasonal variation in the plasma lipids of genetically different types of cattle steers on different diets . Com. Bichem.Physical,44:303 .

Pandit, M.N. and S.N.Singh (1967). Factors affecting crude fiber utilizationruminants. 1-Effect of the levels of molasses at various DCP intakes on roughage utilization . Indian J. Dairy Sci., 20:165 .

Pasierbski , Z . ; S . Wawrzynczak and B . J ocz (1991). Fattening and slaughter performance of Polish Black and White Lowland cattle and crossbreds with various proportions of Holstein genes at different levels of feeding. Rocznicki – Noukowe – Zootechniki, Monografie – Rozprawy 29: 57.

Prasad , D . and K . Pradhan (1990) . Relative feed intake and nutrient digestibility in cattle, buffaloes and sheep due to various levels of concentrate in straw based diets. Indian – Jou of Anim . Sci ., 60 : 4 , 460 .

Reece , W . O . (1991). Physiology of domestic animal. Lea and Fibiger , Philadelphia . London .

Sampath , KT ; CS , Prasad and MT , Shivaramaiah (1993) . Effect of feeding two levels of rumen degradable protein at higher level of energy on growth and nutrient utilization in crossbred femal calves . Indian – Journal – of – Animal – Nutrition . 10 : 2 , 89 (Abstracts) .

Shalaby , T . H . (2000). Fattening of Barki lambs on all concentrate ration : On farm study in north western coastal zone of Egypt . Proc. Conf. Anim . Prod. In the 21th centry , Sakha , 18- 20 April 2000 : 317 .

Sharma , R . and M . P. Singh (1993). Growth and feeding cost of male Murrah buffalo calves on two levels of protein and two system of feeding . Indian Jou . of Anim . Prod . and Mang . 8 : 3 , 150 – 153 .

Sharma , A . K . ; O . R . Takkar and K . C. Chaudhary (1993). Plasma production and milk production in Murrah (Bosbubalis) buffaloes fed with elevated energy levels during pre and postpartum period . Indian Journal of Animal Reproduction , 14 : 1 , 1.

Shehata , O . (1970). Lectures in animal production. Fac. Agric. Ain Shams University. (in Arabic) .

Snedecor , G . W and W . C . Cochran (1982) . Statistical Methods 6th Edition Lowa Stat Uni . Press , Ames USA .

Shin , Kj. ; BS . Lee ; BH . Peak ; GS. Lee and KS . Kim (1989) . Nutritive value of rye silage in the Korean native cattle . 2 – Effect of feeding various levels of concentrate with rye silage on the feed intake and daily gain of Korean native bulls . Research – Reports – of – the – Rural – Development – Administration , - Livestock . 31 : 3 , 11 .

Steingass , H . ; A . Haas ; R . Stetter ; T . Jilg and A . Susenbeth (1994). Influence of feeding level on nutrient and energy digestibility in sheep and cattle . Wirtschaftseigene – Futter . 40 : 2-3 , 215.

Van Keulen , J . and B . A. Young (1977). Evalution of acid insoluble ash as a natural marker in ruminant digestibility studies. J. Anim . Sci ., 44 : 2982 .

Yanar , M . ;Q . Guler and B . Bayram (2002) . Effect of concentrate level on the growth characteristics and feed efficiency of brow Swiss calves . Indian. Jour of Anim. Sci., 72-7 , 612

تأثير مستوى الغذاء على النمو ومعاملات الهضم و الكفاءة الغذائية لعجول الجاموس

جمال فاروق شاهين - عبد العليم احمد زكى - هيكل محمد يوسف

معهد البحوث الإنتاج الحيواني – مركز البحوث الزراعية – وزارة الزراعة – جمهورية مصر العربية

تهدف هذه الدراسة معرفة تأثير استخدام ثلاثة مقررات غذائية مختلفة لعجول الجاموس على معاملات الهضم والنمو ومعدل الأداء وبعض الدراسات الفسيولوجية و كذلك عمر النضج الجنس . استخدم ١٥ عجل جاموسي عمر ستة أشهر بمتوسط وزن ١٤٠ كجم في ثلاثة تجارب نمو متشابهة كل مجموعة تتكون من ٥ حيوانات لاختيار ثلاثة مقررات غذائية وهي المجموعة الأولي تم فيها تغذية العجول على علف مركز وأذرة وقش أرز على أساس ١٠٠ % من احتياجات مجموع المركبات الغذائية المهضومة والبروتين المهضوم بموجب مقررات كيرل ١٩٨٢ . المجموعة الثانية استخدام فيها العليقة السابقة على أساس مقررات شحاتة ١٩٧٠. المجموعة الثالثة تم استخدام نفس العليقة السابقة باستخدام ١٢٥ % من مقررات شحاتة ١٩٧٠ .

وكانت أهم النتائج مايلي :-

- تحسنت معاملات الهضم للمادة الجافة معنويا مع مقررات كيرل و ١٢٥ % من مقررات شحاتة بينما كان التحسن لمعاملات هضم لقيم الغذائية الأخرى غير معنوي وقد أخذت نتائج البروتين المهضوم نفس التحسن لمعاملات المادة الجافة بينما مجموع المركبات الغذائية المهضومة أعطى افضل قيمة مع مقررات كيرل
- زاد الوزن النهائي للعجول وكذلك للزيادة الكلية لنمو و معدل النمو اليومي زيادة معنوية للعجول المعطاة مقررات كيرل و ١٢٥% من مقررات شحاتة بالمقارنة بمقررات شحاتة في نفس الوقت كان هناك تحسن معنوي بالنسبة لكفاءة تحويل المادة الجافة مع مجموعة مقررات ١٢٥% شحاتة بينما كان هناك تحسن عالي المعنوية بالنسبة لكفاءة التحويل مجموع المركبات الغذائية المهضومة و البروتين المهضوم مع مقررات ١٠٠% شحاتة .
- أوضحت النتائج أن عمر البلوغ وعمر النضج الجنسي كان أفضل مع العجول المغذاة على مقررات كيرل و ١٢٥ % من مقررات شحاتة مع تحسن ملحوظ في وزن العجول عند البلوغ والنضج الجنسي.
- أظهرت قياسات الدم عدم وجود فروق معنوية مع أنزيمات النشاط الهضمي وكذلك أنزيمات النشاط الكلوي .
- من هذه الدراسة اتضح أن استخدام مقررات كيرل و ١٢٥ % من مقررات شحاتة أعطت افضل النتائج من حيث الهضم والنمو ومعدل الأداء الإنتاجي لعجول الجاموس . وقد أعطت مقررات ١٢٥ % شحاتة افضل مردود اقتصادي وكذلك عمر البلوغ والنضج الجنسي .
- لذلك نوصى بأن تكون عليقة عجول الجاموس النامي محتويه على مقررات كيرل أو ١٢٥ % من مقررات شحاتة حيث إن هذه المقررات أعطت افضل نتائج لكل من الهضم و الكفاءة الغذائية والنمو ومعدل الأداء الإنتاجي والتناسلي .