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WHOLE CORN MAIZE AND GREEN COTTON PLANTS SILAGES ON FATTENING CALVES

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ABSTRACT

This work was carried out to study the effect of green cotton plants by-product and whole corn silage on feed intake, nutrients digestibility, nutritive value, growth performance and economic efficiency of fattening Friesian crossbred calves fed the following experimental rations:

Ration1 (T_1) 100 % of nutritional requirements from concentrate feed mixture (CFM) + Rice straw (RS) as control.

Ration2 (T_2) 50 % of (CFM + RS) + 50 % of DM whole Corn silage (CS).

Ration3 (T_3) 50 % of (CFM + RS) + 50% of DM cotton plants by product silage (CPS).

Ration4 (T_4) 50 % of (CFM + RS) + 50 % of DM (CS + CPS).

The results showed that, the calves fed T_2 ration which contain wole corn silage and T_4 which contain whole corn silage + cotton plant silage had significantly ($P<0.05$) improved dry matter intake, nutrient digestibility and nutritive value than ration T_3 which contain cotton plant silage.

The daily body gain of Friesian crossbred calves fed rations T_2 and T_4 significantly ($P<0.05$) increased than rations control and T_3. Also, feed conversion and economic efficiency of calves took the same trend of daily body gain.

It showed that, feeding rations containing whole corn silage or whole corn silage + cotton plant silage improved nutrients digestibility, nutritive value, body gain, feed conversion and economic efficiency of Friesian crossbred calves.

keywords : Green cotton plant silage, whole corn silage, digestibility, daily body gain, economic efficiency.

INTRODUCTION

In Egypt, cotton by-products is estimated by a bout 2.5 million ton/ year (Desauke and El-Nauby, 1990). Cotton is versatile crop producing a number of products of value ton man and dom esticated livestock (Jones, 1985).

Cotton by-products could be ensiled after the last picking of cotton, which contain tops, leaves and immature bolls. Abou-Akkada et al. (1989) found that, 47 % of the cotton plant bolls on the stalks were immature and infected. This residues are burned are wasted causing detrimental environmental pollution and health hazard (Hathout and EL-Nouby, 1990).

Cotton plant silage could be used safely, economically and successfully in formulating rations of lactating buffaloes as a cheap ingredient to improve feed intake, digestibility and nutritive value of the ration and improved performance of lactating buffaloes (Marghany et al., 2001).

Reddy and Reddy (1986b) found that, the DM intake and digestibility of nutrients for diets containing 45 % ground whole cotton plants fed by buffaloes were increased.

Also, the total planted area of corn crop was 2 million fedans (Agriculture Economics and Statistics Institute, Egypt, 1997). Therefore, preserving amounts of whole corn plants as a silage may help to reduce feed shortage and cost (Mahmoud *et al.,* 1992).

Recently, corn silage increased rapidly as a forage for dairy cattle and this increase can be related to the relatively high energy yield of corn crop and easy of much annexation with which the whole plant can be ensiled to provide highly palatable source of energy and high quality forage (Mohamed *et al.,* 1999).

Corn silage constitute one-third to two-third of dietary forage dry matter when fed with alfalfa silage to get maximal benefit (Dhiman and Satter, 1997). Moawd et al. (2001) reported that, the rations of dairy cows containing maize and cotton plant silage or plant cotton silage alone could be used safely, economically and successfully.

Whole plant corn is a major and unique forage crop for silage production because of its high DM content, low buffering capacity and high level of soluble carbohydrates there will normally ensure that adequate quantities of lactic acid are produced by fermentation to give a good preservation (Luther, 1986). Ensiled corn crop can be kept for along period of time without significant losses in nutritive values.

The aim of this work was to study the possibility of using plant cotton by-products and whole corn in the rations of fattening calves and its effects on intake digestibility and performance of fattening calves.

MATERIALS AND METHODS:

This experiment was carried out at El-Gemiza Experimental Station, Animal Production Research Institute, Agriculture Research Center, Egypt, to study the possibilty of using cotton plant by-product silage (CPS) and whole corn silage (CS) in fattening calves and its effects on dry matter intake, digestibilaty, nutritive value, growth performance and economical efficiency of Frisian crossbred calves.

The whole cotton plants were harvested above 20 cm from the soil, after last picking of cotton, it contained tops, leaves and immature bolls. It was chopped and mixed with 5 % molasses. The moisture content was about 65 %. Also, the maize plants with ear were chopped after 105 days from planting. The silage from cotton plant or maize were conserved in cement silo of 20 ton capacity each and were good pressed and covered with plastic and tires to get anaerobic conditions for 20 weeks.

Twenty four crossbred male Friesian calves (196 kg in average) were used in growth trials which lasted 182 days. Calves were randomly divided into 4 similar groups (6 animals each) and fed individually on the tested rations: control ration (T_1) 100 % of nutritional requirements from concentrate feed mixture (CFM) + Rice straw (RS), ration 2 (T_2) 50 % of (CFM + RS) + 50 % of DM Corn silage (CS), ration 3 (T_3) 50 % of (CFM + RS) + 50 % of DM Cotton plant silage (CPS) and ration 4 (T_4) 50 % of (CFM + RS) + 50 % of DM (CS + CPS).

The quantity of concentrate feed mixture, rice straw, cotton plant silage and whole corn silage allowance was adjusted every two weeks according to body weight changes by required according to NRC (1989). The CFM and R.S offered twice daily at 8 a.m and 4 p.m then the corn silage or cotton plant silage or (CS + CPS) offered as 50 % allowance .

Animals were watered three times per day and mineral blocks were provided freely along the experimental rations. Animals were weighed on two successive days biweekly after 16 hours fasting period.

The digestibility trials were conducted at the end of growth trail by using 3 animals in each experimental groups, individual feeds and fecal grab samples were collected for a 5 day period and composted for each animal to determine nutrients digestibility using acid insoluble ash (AIA) technique as internal marker according to Van-Keulen and Young (1977). Feeds and faces samples were analyzed according to A.O.A.C (1980). Total volatile fatty acids (VFA's), non VFA's, pH, total acidity and ammonia-N (NH_3-N) were determined in the aqueous extracts of CS and CPS according to A.O.A.C (1980) as shown in table (1 and 2).

Data were statistically analyzed according to SAS, (1995). Differences among means were evaluated using Duncan's multiple range test (Duncan, 1955).

RESULTS AND DISCUSSION

Chemical composition and quality characteristics of silage:

The chemical composition of corn silage and cotton plant silage are shown in table (1) indicated that the contents of DM, OM, CP, CF, EE and NFE for the two silages were nearly similar. The values of different previous items are agreement with those obtained by Marghany et al. (2001) and Moawd et al. (2001).

Table (1):Chemical composition of feed stuffs and expermental rations (on DM basis %).

Items	DM	OM	CP	CF	EE	NFE	Ash
Concentrate feed mixture (CFM)*	90.71	91.13	17.01	12.98	3.28	57.86	8.87
Rice straw (RS)	88.96	84.04	3.44	34.05	1.69	44.86	15.96
Corn silage (CS)	36.11	87.06	9.43	26.65	2.71	48.25	12.94
Cotton plan silage (CPS)	38.75	85.68	8.92	28.91	3.73	44.12	14.32
Calculated composition of the tested rations (%):							
T_1 100 % CFM + RS (control)	90.19	88.99	13.11	19.13	2.88	53.87	11.01
T_2 50 % C + CS	50.00	88.06	11.08	23.14	2.80	51.04	11.94
T_3 50 % C + CPS	55.77	87.53	11.08	23.41	3.32	49.72	12.47
T_4 50 % C + (CS + CPS)	51.64	87.56	11.07	23.63	2.99	49.87	12.44

*** CFM : consisted of 35 % wheat bran, 15 % cotton seed meal, 3 0% yellow corn, 15 % sun flower meal, 3 % molasses, 15 % limestone and 0.5 % salt.**

Data in table (2) represents pH values, ammonia-N, acetic acid, butyric acid and lactic acid of tested silage were characterized by low pH and negligible content of ammonia-N and butyric acid. However, silage

distinguished by high content of acetic acid and lactic acid. This results indicated a good fermentation quality of the two silage, which is comparable with the results reported by Bendary et al. (2001) and Gaafar (2004).

Table (2): Anaerobic fermentation of silage quality (corn silage and cotton plant silage)

Items	CS	CPS
pH value	4.01	4.18
Total acidity (ml / NaOH / 100 g)	27.40	28.12
Ammonia N (ml / 100 g)	0.12	0.14
Free acetic acid (ml / 100 g)	0.92	0.83
Total acetic acid (ml /100g)	1.88	1.22
Free butyric acid (ml / 100 g)	0.11	0.14
Total butyric acid (ml /100g)	0.16	0.19
Lactic acid (ml / 100 g)	6.04	4.86

Digestibility trials :

The results of total dry matter intake as kg / h / dy or g / kg $w^{0.75}$ (Table 3) showed that, feed intake of calves was significantly ($P<0.05$) improved with ration T_2 and T_4 than rations T_1 and T_3. It could be noticed that, the ration contained corn silage or corn silage + cotton plant silage were more palatable than others.

Table (3): Feed intake, digestibility, nutritive values and feed units intake of experimental rations containing corn or cotton plant silage by fattening calves.

Items	Experimental rations			
	T_1	$_2$	T_3	T_4
BW (kg)	35767 ± 10.84	374 ± 2.65	331.33 ± 0.88	365 ± 2.08
$B.W^{0.75}$	82.25 ^{bc} ± 0.51	85.05 ^{a} ± 0.45	77.66 ^{d} ± 0.15	83.51 ^{b} ± 0.45
Daily DM intake (kg):				
CFM	5.40 ^{a}	2.70 ^{b}	2.70 ^{b}	2.70 ^{b}
RS	2.23	1.11	1.11	1.11
CS		4.40		
CPS			3.41	
CS + CPS				4.23
Total DM intake (kg)	7.63 ^{b} ± 0.003	8.21 ^{a} ± 0.001	7.22 ^{b} ± 0.008	8.04 ^{a} ± 0.008
Total DM intake g / kg $^{W0.75}$	93 ^{b} ± 0.003	96 ^{a} ± 0.003	93 ^{b} ± 0.00	96 ^{a} ± 0.00
Digestion coefficients (%)				
DM	67.51 ^{b} ± 0.02	69.15 ^{a} ± 0.13	64.56 ^{c} ± 0.01	68.86 ^{a} ± 0.11
OM	69.12 ^{b} ± 0.23	71.92 ^{a} ± 0.11	67.11 ^{c} ± 0.12	71.09 ^{a} ± 0.16
CP	70.02 ^{b} ± 0.19	76.61 ^{a} ± 2.97	69.10 ^{c} ± 0.14	76.12 ^{a} ± 0.01
CF	60.20 ^{b} ± 0.01	61.64 ^{a} ± 0.01	56.18 ^{c} ± 0.17	60.95 ^{a} ± 0.01
EE	76.24^{c} ± 0.31	76.54 ^{bc} ± 0.01	77.02 ^{b} ± 0.10	78.43 ^{a} ± 0.26
NFE	76.51 ^{c} ± 0.17	78.16 ^{cb} ± 0.13	73.13 ^{d} ± 0.01	74.43 ^{a} ± 0.01
Nutritive values (%)				
TDN	66.87 ^{c} ± 0.15	68.87 ^{a} ± 0.01	62.93 ^{d} ± 0.10	67.72 ^{b} ± 0.01
DCP	9.18 ^{a} ± 0.002	8.49 ^{b} ± 0.00	7.66 ^{c} ± 0.001	8.43 ^{b} ± 0.008
Daily feed units intake :				
TDN kg / kg	5.14 ^{b} ± 0.10	5.65 ^{a} ± 0.00	4.54 ^{c} ± 0.00	5.44 ^{a} ± 0.00
TDN g / kg $^{W0.75}$	62.14 ^{c} ± 0.90	66.12 ^{a} ± 0.16	58.52 ^{d} ± 0.30	65.01 ^{a} ± 0.25
DCP kg	0.70 ^{a} ± 0.00	0.70 ^{a} ± 0.00	0.55 ^{c} ± 0.00	0.68 ^{b} ± 0.00
DCP g / kg $^{W0.75}$	8.54 ^{a} ± 0.00	8.15 ^{a} ± 0.00	7.12 ^{c} ± 0.00	8.09 ^{b} ± 0.00

a, b, and c, means in the same raw with different superscript differ ($P<0.05$).

Digestion coefficients of DM, OM, CP and CF of T_2 and T_4 rations were significantly (P<005) higher than T_1 and T_3 rations. Also, the same items of T_1 were significantly (P<0.05) higher than T_3 ration. On the other hand, the digestion coefficient of EE and NFE of T_4 ration was significantly (P<0.05) higher than T_2 , T_1 and T_3 rations. Also, the digestion coefficient of EE of T_3 and T_2 rations was significantly (P<0.05) higher than for T1 ration, moreover, the digestibility of NFE of T_1 and T_2 ration was significantly (P<0.05) higher than T_3 ration.

The increase of nutrients digestibility for T_4 ration may be due to the associated effect of two silages intake (corn silage and cotton plant silage) and concentrate feed mixture, the same trend was obtained by Dhiman and Satter (1997), Staples et al. (1997), Nichols et al. (1998) and Moawd et al. (2001).

The nutritive values as TDN of T_2 ration was significantly (P<0.05) higher than other rations may be due to increase of DM intake and most of nutrients digestibility. But, DCP of T_1 ration (control) was significantly (P<0.05) higher than others. The same trend were obtained by Nichols *et al*. (1998), West *et al*. (1998), Marghany *et al*. (2001) and Moawd *et al*. (2001).

The feed units intake as TDN (kg / h / d or g / kg $w^{0.75}$) for calves fed T_2 and T_4 rations were significantly (P<0.05) higher than those fed T_1 and T_3 rations, while DCP intake as kg / h / d or g/ kg $w^{0.75}$ for calves fed T_1 and T_2 rations were significantly (P<0.05) higher than calves fed T_3 and T_4 rations. These results may be due to improve of TDN and DCP values. The same trend were obtained by El- Tahan et al. (2005) with maize silage.

Growth performance:

Weight gain, feed intake and feed conversion of Friesian crossbred calves fed rations containing corn and cotton silages are shown in table (4). The highest (P<0.05) values of final weight (kg), total gain (kg) and daily gain (g) were recorded with calves fed T_2 and T_4 rations which contained corn silage or corn and cotton plant silages, while the lowest (P<0.05) values were recorded with calves fed T_3 which contained cotton plant silage alone. These results agree with those reported by El-Tahan et al. (2005) with maize silage.

The results of DM intake as kg / 100 kg B.W and g / kg $w^{0.75}$ (table 4) showed that, feed intake was slightly decreased in calves fed rations containing corn silage or corn and cotton plant silage (T_2 and T_4 , respectively) compared with those fed control ration (T_1) and cotton plant silage (T_3). Similar trend were obtained by Moawd *et al*. (2001) reported that, cattle consumed more of corn, cotton plant silage. Also, Marghany *et al*. (2001) and El-tahan *et al*. (2005) had the same trend with cotton plant silage and corn silage, respectively.

The daily feed units intake as TDN and DCP per Kg / h / d or g / kg $w^{0.75}$ of rations T_1 (control), T_2 (CS) and T_4 (CS and CPS) were slightly higher than T_3 ration (CPS). This increase may be due to the increase of nutritive values and DM intake of the rations (T_1 , T_2 and T_4). The same trend was obtained by Marghany *et al*. (2001) and Moawd *et al.* (2001).

Table (4): Weight gain, feed intake and feed conversion of Friesian crossbred calves fed the experimental rations.

Items	Experimental rations			
	T_1	T_2	T_3	T_4
Duration of trial (day)	182	182	182	182
No. of animals	6	6	6	6
Initial wt (kg)	196.17 ± 3.62	196.33 ± 3.49	196.17 ± 3.55	196.17 ± 2.68
Final wt (kg)	351.50 ^{b} ± 3.19	380.00 ^{a} ± 3.33	326.17^b ± 2.52	371.33 ^{a} ± 3.04
Total gain (kg)	155.33 ^{b} ± 1.76	183.67 ^{a} ± 1.82	129.33 ^{b} ± 1.95	175.16 ^{a} ± 2.11
Daily gain (kg)	0.854 ^{b} ± 0.01	1.01 ^{a} ± 0.01	0.854 ^{b} ± 0.01	0.969 ^{a} ± 0.01
Daily FI as fed (kg/h/d)				
CFM	5.080	2.56	2.56	2.56
RS	1.619	0.809	0.809	0.809
CS		8.970		
CPS			7.329	
CS + CPS				8.42
Total daily FI as fed (kg/h/d)	6.699	12.339	10.698	11.789
daily DM intake (kg/h/d)				
CFM	4.608	2.304	2.304	2.304
RS	1.440	0.720	0.720	0.720
CS		3.239		
CPS			2..840	
CS + CPS				3.152
Total daily DM intake Kg/h/d	6.048	6.263	5.864	6.176
Daily DM intake kg / 100 kg BW				
Daily DM intake g / kg $^{W0.75}$	74.50	72.77	76.40	73.01
Daily TDN intake kg / h / d	4.042	4.313	3.690	4.182
Daily TDN intake g / kg $^{W0.75}$	49.79	50.11	48.08	49.44
Daily DCP intake g / h / d	555.21	531.73	449.18	520.64
Daily DCP intake g / kg $^{W0.75}$	6.84	6.18	5.85	6.16
Feed conversion :				
Kg DM / kg gain	7.08	6.20	8.24	6.42
Kg TDN / kg gain	4.73	4.27	5.18	4.35
Kg DCP / kg gain	0.650	0.527	0.631	0.541

a, b and c, means in the same raw with different superscripts differ (P<0.05)

The best feed conversion as kg DM, TDN and DCP per kg gain were observed with ration T_2 , T_4 followed by T_1 and T_3 ration. Similar results were observed with Moawd *et al*. (2001) , Marghany *et al*. (2001) and El-Than *et al*. (2005).

Economical efficiency:

The results of the economical evaluation of crossbred Friesian calves fed rations containing corn or cotton plant or corn plus cotton plant silages are show in table (5).

Feed cost / kg gain were 4.03, 4.88 and 3.93 LE for calves fed rations T_2 , T_3 , T_4 respectively, but the highest value were 6.55 for calves fed ration T_1 (control). It was noticed that, the feed cost / kg weight decreased with fed silages plus 50 % CFM. In this connection, the net return of calves increased with rations T_2 (CS) and T_4 (CS + CPS) than control (T_1) and T_3 (CPS only) rations. While, the return of calves fed control T_1 and T_3 were similar. The same trend were obtained with economical efficiency and relative LE of return %. These results are agreement with recorded by Moawd *et al*. (2001), Marghany *et al*. (2001) and El-Tahan *et al*. (2005).

Table (5): Economical efficiency of Friesian crossbred calves fed the experimental rations.

Items	Experimental rations							
	T_1		T_2		T_3		T_4	
	Weight (kg)	Price (LE)	Weight (kg)	Price (LE)	Weight (kg)	Price (LE)	Weight (kg)	Price (LE)
Initial wt (kg)	196.17	2400	196.33	2400	196.67	2400	196.17	2400
Final wt (kg)	351.50	4745.25	380.00	5130	326.17	4403.30	371.33	5012.96
Total gain (kg)	155.33		183.67		129.50		175.16	
Total feed intake as feed (kg)								
CFM	924.56	993.90	465.92	500.86	465.92	500.86	465.92	500.86
RS	294.66	23.57	131.04	10.48	131.04	10.48	131.04	10.48
CS			1632.54	228.56				
CPS					1333.88	120.05		
CS + CPS							1532.44	176.23
Total feed cost / calve	1219.22	1017.47	2229.5	739.90	1930.84	631.39	2129.40	687.57
Feed cost / kg gain		6.55		4.03		4.88		3.93
Total cost of calve		3417.47		3139.9		3031.39		3087.57
Net return of calve		1327.78		1990.1		1371.91		1925.39
Economical efficiency (LE)		0.39		0.63		0.45		0.62
Relative of return (%)		100		161.5		115.4		159

CFM / ton = 1075 LE, RS / ton = 80 LE, CS / ton = 140 LE, CPS / ton = 90 LE, CS + CPS (1 : 1) = 115 LE and Live body weight / kg = 13.5 LE.

Several workers (Mahmoud *et al.,* 1992; El-Sayes *et al.,* 1997 and Khinizy et al., 1997) reported that, using maize silage for dairy cattle or fattening improved their performance and reduced cost of feeding and minimize the amount of expensive concentrate in daily rations.

It could be concluded from the previous data that, cotton plant silage alone or with whole corn silage could be used as 50 % from nutritional requirments safely, economically and successfully for fattening crossbred Friesian calves without any adverse effects on the performance and health.

REFERENCES

Abou-Akkada, A. R.; M. H. Ahmed; S. M. Zahran; A. E., Tagel-Din and A. M. Nour (1989). Evaluation of bolls in complete diets for ruminant animals. Proc. Third Egyptian – British conf. on Animal, Fish and Poultry Production. 7 – 10 Oct., pp. 75, Alexandria , Egypt.

Agriculture Economic (1992). Institute of Agric. Economic,. Ministry of Agric., Egypt.

A.O.A.C. (1990). Association of Official Analytical Chemists. Official Methods of Analysis 13th Ed. Washington DC, USA.

Bendary, M.M.; S.A. Mahmoud; A.M. Abd El-Raouf; M.K. Mohsen and H.M.A. Gaafar (2001). Economical and nutritional evaluation of ensile corn crop. The 8th Scientific Conference on Animal Nutrition Par (1) Ruminants. Vol 4

Desouke, A. and H. El-Nouby A(1990). National development organization forage resources development for animal production. Anim. Prod. Res. Instit., German Project (GTZ).

Dhiman, T. R. and L. D. Satter (1997). Yield response of dairy cows fed different proportions of alfalfa silage and corn silage. J. Dairy Sci., 80 : 2069.

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

EL- Sayes, M.F.; M.R. Mostafa and M.K. Hathout (1997). Nutritional and economic efficiency for using the maize silage in fattening buffalo calves locally, 5th World Buffalo Congress. Animal Prod. Res. Inst. A.R.C. Pp. 386, Giza, Egypt.

El-Tahan, A. A.; R.I. Moawd; A. A. Zaki and M. Marghany (2005). Effect of adding tafla clay on performance of growing calves fed retaion containing maize silage. Egy. J. Nut. And Feeds 8(1) Special Issue, 167 – 178.

Gaafar, H.M.A.; (2004). Effect of grain content on corn hybrids on nutritive value of whole plant corn silage. Eg. J. Nu. And Feeds, 7 (1) : 1 – 10.

Hathaut, M. K. and H. M. El-Nauby (1990). Practical application of crop residues treatment in Egypt 3rd Int. Symp. on feed Manufacture and Quality Control. Pp. 337.

Jones, L. A. (1985). Gossypol chemistry and plant distribution. In Male Fertility and its Regulation. Pp. 93, T. J. Lobl and E.S.E. Hafez. Ed. MTP Press Limited, Boston, USA.

Khinizy, A.E.M.; R.T. Fouad; M.M. Mohy EL-Dean Bader ; B. Motter and A.A.M. Fahmy (1997). Effect of feeding whole green maize silage with urea molasses mineral mixture on performance of buffalo calves. Egypt J. Appl. Sci. 12 : 408.

Luther, R. M. (1986). Effect of microbial inoculation of whole plant corn silage on chemical characteristics, preservation and utilization by steers. J. Anim. Sci., 63 : 1329.

Mahmoud, A.M.; M.M. Bendary; M.A. Harfouh and G.A. Ramadan (1992). Effect of feeding lactating cows corn silage on milk production compared with traditional summer and winter rations. J. Agri. Sci. Mansoura Unv., 17: 1904.

Marghany, M.; A. A. H. El-Tahan; R. I. Moawd; A. A. Zaki and H. Ghanem (2001). Effect of cotton plant silage supplementation by milk rations on digestibility and milk production by dairy buffaloes. Egy. J. Nut. And Feeds, 4 (special Issue) : 365 – 375.

Moawd, R. I.; A. A. Zaki; M. Marghany and A. A. H. El-Tahan (2001). The effect of replacing cotton plant silage with maize silage on milk production of dairy cows. Egy. J. Nut. And Feeds, 4 (Special Issue) : 117 – 127.

Mohamed, M. M.; M. M. Sayeda ahmed and M. M. Bendary (1999). Productive and reproductive of growing calves fed rations containing maize silage. Eg. J. Nut. And Feeds, 2 (special Issue) : 445 – 454.

Nichols, S. W.; M. A. Froetschel; H. E. Amos and L. D. Ely (1998). Effect of fiber from tropical corn and forage sorghum silage on intake digestion and performance of lactating dairy cows. J. Dairy Sci., 81 : 2383.

NRC (1989). Nutrient Requirement of Domestic Animals. Nutrient Requirements of Cattle. National Research Council. National Academy of Science, Washington, D.C., USA.

Reddy, G. V. N. and M. R. Reddy (1986b). Effect of anhydrous ammonia treatment and processing of whole cotton plants as roughages source in complete feeds for buffaloes Indian. J. of Anim. Sci., 56 : 93.

SAS Institute, Inc. (1995). SASI STAT Guide for personal computer, Vers I.
Staples, C. R.; S. M. Emanucle and G. M. Prine (1997). Intake and nutritive value of Florigroze rhizoma peanut silage for lactating dairy cows. J. Dairy Sci., 80 : 541.
Van-Keulen, J. and B. A. Young (1977). Evaluation of acid insoluble ash as a natural marker in ruminant digestibility studies. J. Anim. Sci., 44 : 2982.
West, J. W.; P. Mandebvu; G. M. Hill and R. N. Gates (1998). Intake, milk yield and digestion by dairy cows fed diets with increasing fiber content from Bermuda grass hay or silage. J. dairy Sci., 81 : 1599.

تسمين العجول على سيلاج الذرة كاملا مع حطب القطن الأخضر

مصطفى مرغني
معهد بحوث الإنتاج الحيواني – مركز البحوث الزراعية – وزارة الزراعة - جمهورية مصر العربية

تهدف هذه الدراسة مدى إمكانية استخدام سيلاج الذرة وسيلاج نبات القطن وإحلالهما نسبيا محل العلف المركز وتأثير التغذية عليهما على المأكول ومعاملات الهضم والقيمة الغذائية ومعدل النمو والمردود الاقتصادي لهذه العلائق في تسمين العجول – واستخدم عدد ٢٠ عجل غريزيان خليط بمتوسط ١٩٦ كجم لدراسة تأثير العلائق وقسمت العجول إلى ٤ مجاميع (٥ عجول لكل مجموعة) وكانت العلائق التجريبية كالآتي:

1) ١٠٠% من الاحتياجات الغذائية من مخلوط العلف المركز + قش أرز (عليقة كنترول).
2) ٥٠% من عليقة الكنترول + ٥٠% سيلاج ذرة
3) ٥٠% من عليقة الكنترول + ٥٠% سيلاج نبات القطن
4) ٥٠% من عليقة الكنترول + ٥٠% (سيلاج ذرة + سيلاج نبات القطن)

وكانت أهم النتائج:

١- تحسن معنوي (٥%) للمأكول ومعاملا ت الهضم والقيمة الغذائية للعجول المغذاة على العليقة الثانية والرابعة مقارنة بالعليقة الثالثة.
٢- زيادة معنوية (١%) لمعدل النمو اليومي للعجول المغذاة على العليقة الثانية والرابعة مقارنة بالعليقة الأولى والثالثة.
٣- زيادة معنوية (١%) للتحويل الغذائي والكفاءة الإقتصادية للعجول المغذاة على العليقة الثانية والرابعة مقارنة بالعليقة الأولى والثالثة.

مما سبق يتضح أن علائق العجول الفريزيان الخليط المحتوية على سيلاج الذرة أو سيلاج الذرة + سيلاج نبات القطن قد استخدمت بكفاءة عالية وأمكن تخفيض كمية العلف المركز بنسبة ٥٠% من الاحتياجات الكلية مع تحسن في معاملات الهضم والقيمة الغذائية ومعدل النمو والعائد الاقتصادي من إنتاج اللحم.

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