EFFECT OF USING THREE VARIETIES OF SORGHUM BICOLOR STOVER SILAGES ON PERFORMANCE OF GROWING AND FATTENING LAMBS.

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SUMMARY

This study aimed to evaluate and compare three varieties of sorghum bicolor stover after ensiled without any additives. Twenty Ossimi Lambs were selected and randomly distributed in a completely randomized block design with four dietary treatments: control ration (CR) which comprised of 60% concentrate feed mixture (CFM) and 40 % clover hay, and the three tested silage rations R_1, R2, R_3 were formulated from 50% CFM for each in addition 50% of the respective Sha-2 hybrid, ICSV-273 and Dorado varieties silages, with five replicates and experimental period of 120 days for growth-fattening performance trial. Four digestibility trials were performed to evaluate the feeding value of the control and silage rations. Results indicated that no significant differences were noticed among the three types of silage respecting pH, ammonia –N and butyric acid. The total VFAs, lactic acid and acetic acid concentrations were significant ($P<0.05$) lower with ICSV-273 than those of other types. Totally, on the basis of pH, acid concentrations and ammonia-N, all silages were of good quality. Digestibility coefficients of DM, OM, CF and NFE were significantly ($P<0.05$) higher with all silage rations than the control one, while vice versa was occurred with digestibility of CP and EE. Within tested rations, significant differences among them were found in most nutrients, with superiority almost for R_1. Digestibility of CP was not affect by the type of silage. The digestibility of NDF and ADF were followed similar trend to those of CF. Intake of DM and daily gain did not significantly influenced by the dietary treatments. The best-feed conversion efficiency was achieved by CR group respecting DM, TDN and DCP: gain, with significant differences only in case of TDN, among treatments. Across silage rations, differences related these items being non significant. The economical efficiency was potentially in favorable of silage rations with very slightly differences among them. It could be concluded that the silages of the three varieties of sorghum stover are valid substitutions for clover hay and / or some other medium quality roughages in sheep rations. Potentially it can be beneficial for smallholder's farmers during the period of forage scarcity.

Keywords: *Sorghum stover silage, feeding value, sheep, growth,fattening performance.*

INTRODUCTION

Huge quantities of straws and Stover's are produced annually worldwide. Some of these materials are fed to livestock, returning directly to the soil or burnt. If the feeding values of

such materials were higher or better understood, it might be possible to increase the proportion which being fed and to obtain better results from feeding it. Research has concentrated on ways in which feeding value might be enhanced chemically or by other treatments (Sundstol and Owen, 1984) , on suitable supplementary feeds and on the potential for selection within crop species for straw or stover of high feeding value (Vadiveloo , 1995). Over recent years, in most developing countries, a continuous effort has been made to develop improved varieties of maize for grain production. Usually, the breeding programs are basically aimed to improvement of grain yield without concern for yield and quality of the stover's. Traditionally and due to the acute shortage in highly nutritive value of green forage in such developing countries ,especially in Africa,. stover's and other fibrous by – products are considered as important sources of feed for livestock and further likely would be increase more grazing land put under cultivation of cereal crops due to rapidly increasing population pressure. In such circumstances, it is desirable to produce a higher yield of better quality stover's without sacrificing grain yield.

Large variability exists in the nutritive value of the most cereal straws (Capper *et al.*, 1989, Ørskove *et al.*, 1990 and Tolera *et al.*, 1999). The *in vitro* organic matter disappearance (IVOMD) of 26 sorghum varieties was found to vary from 38% to 55% (Reed *et al.*, 1986). Harika and Sharma (1994) indicated varietal differences in grain yield, stover yield, total biomass yield, neutral detergent fiber (NDF) and nylon bag dry matter degradability of the stover based on three varieties of maize. Varietal differences in nutritive values of cereal crop residues could be due to differences in the relative proportions of the botanical fractions in the whole straw/stover and consequently the differences between and within these fractions in their chemical composition, digestibility and acceptability by animals (Walli *et al.*, 1994). Flachowsky *et al.* (1991) showed that cultivars with higher straw quality were not consistently associated with lower grain yields, and this gives a potential to select for a high quality crop residue without sacrificing grain yield. Using ensiling technique, Mostafa *et al.* (2000) revealed that maize stover silage enriched with urea and molasses at ensilage time could be a successful way for raising the feeding value of this crop residue and therefore can efficiently applied in animal feeding formula both in summer and autumn under Egyptian conditions. In this study, three varieties of sorghum stover silages were used to assess their impact on lambs growth and fattening performance when incorporated as a sole source of roughage in their rations.

MATERIALS AND METHODS

This work was carried out at Sids Animal Production Research Station (Beni Swief Governorate) that belongs to Animal Production Research Institute, ARC, Ministry of Agriculture.

Silage making and analysis:

Directly after grain harvested, ensiling technique conserved three varieties of green sorghum stover bicolor. Such varieties, which included Sha-2 hybrid, ICSV-273 and Dorado, were chopped to about 1 – 1.5 cm length. Table (1) shows some growth and botanical characteristics of sorghum genotypes. The biomass was ensiled in three horizontal wall silos (2 x 3 x 1.5 m each). In order to ensure good consolidation for each

layer after filling the whole silo were done by labor's feet, covered carefully by plastic sheet and pressed hardly by the soil and some blocks. The silos were opened for feeding after 2- month ensiling period. Silage samples were taken for determining chemical composition and fermentation characteristics. Silage pH was directly determined using digital pH meter. The concentration of TVFA,s were determined according to the method of Warner (1964). Ammonia- N, lactic acid and individual VFA,s were analyzed according to the methods described by Everson *et al.* (1971). Neutral detergent fiber (NDF) and acid detergent fiber (ADF) and acid detergent lignin (ADL) were analyzed by the method of Van Soest (1982). Cellulose and hemicellulose were accordingly predicted.

Table (1): Growth and botanical characteristics of grain sorghum genotypes.

Genotypes	Plant height (Cm)	No. of green Leaves	Leaf/Stem ratio	Stem diameter (Cm)	Fodder yield Ton/Fed
Sh-2 hybrid	189	13	0.20	2.6	18.7
ICSV - 273	229	12	0.13	2.3	23.7
Dorado	135	13	0.35	2.2	12.4
L.S.D	12.2	n.s	0.05	0.4	6.5
CV%	3.81	9.71	12	8.66	20.5

Animals and feeding:

Twenty Ossimi lambs averaged 20.5 Kg live body weight were used in a 120- d comparative feeding trial. Animal were divided into four similar groups of five replicates according to their LBW and rate of daily gain during a 21 – d preliminary period in which all experimental animals were fed on unified diet. Using a randomized complete block design, animals were individually fed a suitable quantity for each one over the 120 – d experimental period according to NRC requirement standard for Sheep (1985) on the following dietary treatments: control ration (CR) which comprised of 60% CFM plus 40% of clover hay, tested rations R_1, R_2 and R_3 were of 50% CFM for each in addition 50% of Sh-2 hybrid, ICSV-273 and Dorado silages, respectively, based on total digestible nutrients (TDN). Mineral blocks and fresh water were freely available along the day round. Animals were treated against internal and external parasites and full hygienic care was secured throughout the trial. Feed orts were removed and weighed once daily prior to the morning feeding and. consequently the daily feed intake for each animal was recorded to estimate the feed conversion parameter. Shrunk weights of animals, after overnight withdrawal feed and water, were recorded on two consecutive days at the beginning and at the end of the trial biweekly. Accordingly, the daily requirements of feed for lambs were monitored.

Digestibility trials:

Four *in vivo* digestibility trials were conducted simultaneously on three animals from each treatment, at the final month of the feeding trial, to determine the feeding values of the experimental rations. Metabolic cages were used with collection period of one week

which was preceded by 10 –d as transition one. Weights of feed intake and feces were recorded and representative composite samples were prepared and stored at – 20 C^0 until chemical analysis. Feedstuffs and feces samples were dried at 70 C^0 for 24 hrs and then ground to pass through a 1 mm screen and its chemical composition were determined according to A.O.A.C. (1990).

Statistical analysis:

Data were statistically analyzed using general linear method according to ANOVA procedures of SAS User Guide (1998). Duncan's multiple range test (1955) was applied to test for significant differences among means of traits. The following model was used:

$Y_{ij} = U + T_i + e_{ij}$ where Y_{ij} = observation, U = overall mean, T_i = effect of treatment and e_{ij} = experimental error.

RESULTS AND DISCUSSION

Silage quality:

Results of silage quality (Table 2) indicated that no significant ($P<0.05$) differences were noticed among the three types of silage in respect of pH, ammonia nitrogen and butyric acid parameters. The concentrations of TVFAs, lactic acid and acetic acid appeared to be significant lower with ICSV-273 silage than those of the other silages. Totally all values obtained in the present study regarding the above traits closely matched those found by Salle (1961) for good quality silage.

Table (2): Fermentative characteristics of the three types of sorghum stover silages.

Item	*Sh-2 hybrid*	ICSV	Dorado	SE
pH	3.9	3.8	3.9	NS
Acids as % of silage DM:				
TVFAs	2.49^a	2.03^b	2.30^a	0.09
lactic acid	6.91^a	6.47^b	6.84^a	0.095
Acetic acid	2.35^{ab}	2.13^b	2.40^a	0.07
Propionic acid	0.04^b	0.05^a	0.04^b	0.002
Butyric acid	0.49	0.51	0.50	NS
NH_3 - N	5.35	5.98	4.98	NS

a,b mean in the same row with different superscripts differ significantly (P< 0.05).

Also, earlier estimation of Waston and Nash (1960) revealed that good quality silage must have a pH value 3.9 – 4.8 or lower, 3.03 – 13.16 % lactic acid, 1.02 – 2.87 % acetic

acid and have traces or no butyric acid (0.2 % and do not exceed 0.4 %). In agreement with the present results, Bendary and Younis (1997) revealed that although green maize was ensiled without any additives, it produced good quality, silage with suitable fermentation characteristics, yellowish green color and good smell. Gross and Riebe (1974) concluded that corn stalks is regarded as the best raw materials for making silage due to their content of soluble sugars which make it possible to ensiling the fodder mass without preservatives. Generally, on the basis of pH and acid concentrations, the three silages testd in the present studywere of good quality.

Chemical composition:

The chemical composition of the three silage types is presented in Table (3). There were marked differences among the three varieties of sorghum stovercompared corresponding to the Dorado variety that had the lowest. Exclusively the varieties did not appreciably differ in their CP, EE and NDF contents. Inversely NFE content was higher with Dorado variety than that of the other two varieties.

Table (3): Chemical composition of the sorghum stover silage varieties as DM basis.

Variety	DM	CP	CF	EE	Ash	NFE	NDF	ADF	ADL	Cellulose	Hemicel*
Sh-2 hybrid	39.17	6.27	30.71	1.90	12.8	48.32	65.11	43.98	7.81	36.17	21.13
ICSV	40.21	6.16	29.69	1.87	12.57	49.71	64.55	41.50	7.31	34.19	23.05
Dorado	36.57	6.36	28.71	1.78	11.33	51.82	64.03	39.78	7.19	32.59	24.25
SE	0.3	0.15	0.31	0.07	0.15	0.47	0.31	0.12	0.09	0.17	0.32

*-Means of 5 samples, *Hemicellulose*

It could be observed that the contents of CP are much lesser and NDF and ADF are much higher than those, for instance, the whole corn silage which has been characterized as excellent forage for ruminants. The findings reported by Yacout (2001) for whole corn silage, being 9.80 % CP, 35.90 % ADF and 56.40 % as NDF compared to 6.16 – 6.36 % CP, 39.78 - 43.98 % ADF and 64.03 – 65.11 % NDF for sorghum silages in the present study. The results obtained here are in harmony with those recorded by Tolera *et al.* (1999) who ensiled eight varieties of maize stover's and found significant differences among them in respect of contents of CP, Ash, NDF, ADF, lignin, cellulose and hemicelluloses. Consistently, they added that CP content of all varieties was below 70 g kg DM^{-1} which was considered as the critical level to influence feed intake. Considerably, sorghum stover silage from all varieties had low CP and high lignocellulosic cell – wall concentrations which characterise the features of most cereal crop residues.

Regarding the correlation between the grain yield and crop residue yield and quality, Tuah *et al.* (1986) indicated that straw quality is not correlated with grain yield and quality and therefore suggested that they can be manipulated independently. However, negative relationship between grain yield and stover quality might be recognized if translocation of the soluble nutrients to the kernels is hampered by stress conditions, such as drought

(Ørskov*et al.*, 1990). Thus plant breeders and animal nutritionists should jointly strive for increasing the output from the whole farm by improving both grain and crop residue yield and quality. Generally, according to the findings of (Ørskov*et al.* 1990), the ability of plant breeders to manipulate quality and grain yield may become more desirable as the pressure to utilize renewable resources increases. Improving compositional characteristic through plant genetics has become a major focus for many research and business efforts (Baijalieh, 2002).

Chemical composition of CFM and clover hay and the calculated values of theexperimental rations are presented in Table (4). Data clearly indicated that the chemical composition of clover hay is commonly comparable to that recorded in the literature. Also

Table (4): Chemical analysis (as DM basis) of concentrate feed mixture and clover hay and calculated composition of experimental rations.

Items	CP	CF	EE	Ash	NFE	NDF	ADF	ADL	Cellulose	Hemicel*
CFM	13.69	12.31	2.82	9.62	61.56	39.19	16.08	4.11	11.97	23.11
Clover hay	11.93	32.67	1.61	10.11	43.68	53.14	37.22	5.68	31.54	15.92
CR	13.06	19.66	2.4	9.7	55.18	44.2	23.67	4.67	19.00	20.53
R_1	9.83	21.88	2.34	11.27	54.68	52.67	30.59	6.03	24.56	22.08
R_2	9.88	21.1	2.34	11.11	55.57	52.02	28.94	5.73	23.21	23.08
R_3	10.14	20.24	2.32	10.45	56.85	51.2	27.54	5.59	21.95	23.66

**Hemicellulose*

the manufactured CFM that involved in the experimental rations had suitable contents of nutrients particularly CP and CF and its fractions (Table 4). Regarding the calculated composition of CR, R_1, R_2 and R_3, it could be observed that CR had markedly higher content of CP and lesser CF content than those of the all tested silage rations. These differentiations are mostly due to the difference of CP content between clover hay and sorghum stover silages and/or due to the different percentages of CFM that incorporated in control vs. tested rations. Owing to the low protein content in the sorghum stover silages (6.16 – 6.36%), all tested rations had slightly lower CP content than the required need by growing sheep (NRC, 1985). However, the results of Abd El – Baki *et al.* (1989) indicated that corn stover fodder could be successfully ensiled without any additives. In addition, Ramadan (1972) indicated that the protein of corn fodder harvested at 100 days of cultivation and its silage was of high biological value when fed to sheep. The utilization of dietary protein must be put in the context of the available energy supply in which it is the main driving force of metabolism (Miller, 2002).

Digestion coefficients and feeding values:

Digestibility data presented in Table (5) showed that digestibility coefficients of DM, OM, CF and NFE were significantly ($P<0.05$) higher with all tested rations than the CR one, while *vice versa* was recorded with CP and EE across tested rations since, significant differences among them in digestibility of most nutrients were observed, with superiority almost for R_1. The digestibility of CP was not affected by silage variety. The digestibility

of the fractions of CF (NDF, ADF, cellulose and hemi cellulose) followed similar trends to those of CF among treatments, with the highest values occurred with R_1 and the lowest with CR, while R_2 and R_3 tended to be in the middle. These results are in close agreement with those achieved by Bendary *et al.* (2001) who found that significant differences in all nutrients digestibility amongst silages prepared from different hybrids and varieties of corn crop. The lower CP digestibility in tested rations in comparison with that of CR might be due to the low content of CP in the tested rations and originally in the sorghum stover silages (Table 3). The earlier findings of Fonnesback *et al.* (1981) support the present obtained results where they found that CP digestibility was closely related to dietary CP level and sources. For further explanation to this point, the findings of Mostafa *et al.* (2000) indicated that addition of urea – N and molasses to maize stover silage improved nutrients digestibility of CP and CF in particular and accordingly its nutritive value accordingly. Furthermore, Miller (2002) recommended that sufficient nitrogen with optimizing the amount of degradable and undegradable proteins could be maximize the digestibility of ruminants' rations.

Table (5): Digestibility and feeding values (%) of the experimental rations.

Rations	DM	OM	CP	CF	EE	NFE	NDF	ADF	Cellulose	Hemicel#	TDN*
CR	64.50^{d}	67.15^{c}	75.06^{a}	51.47^{d}	76.21^{a}	70.52^{c}	54.10^{c}	47.20^{c}	47.44^{c}	62.06^{c}	62.96^{c}
R_1	68.34^{c}	78.35^{a}	65.05^{b}	64.70^{a}	76.56^{a}	86.28^{a}	64.50^{a}	55.03^{a}	56.35^{a}	77.60^{a}	71.76^{a}
R_2	75.22^{b}	75.58^{b}	64.84^{b}	59.65^{b}	74.02^{b}	83.60^{b}	61.86^{b}	52.41^{b}	53.10^{b}	73.34^{b}	69.35^{b}
R_3	76.70^{a}	77.27^{a}	66.24^{b}	58.08^{c}	72.48^{b}	86.26^{a}	60.95^{b}	50.57^{b}	51.32^{b}	73.04^{b}	71.29^{a}
SE	0.41	0.35	0.44	0.47	0.48	0.54	0.43	0.8	0.83	0.77	0.31

**% Of DM , #Hemicellulose*

a, b, c, d Mean in the same column with different superscripts differ significantly (P<0.05).

The higher CF and its fractions digestibility with silage rations (R_1, R2, and R_3) against clover hay ration (CR) might be attributed to the biological treatment (ensilage process) which have favorable effect on cell wall digestibility and as well as probably partially due to the effect of maceration which opened more fibrous surface area to rumen microbes access and in turn improving the digestion of fiber (Lu *et al.*, 1979). The extent of digestion is only limited by the structural nature of the plant fiber and the degree to which this fiber is embedded in or surrounded by lignin (Leng, 2002). Earlier study indicated that the chemical nature of fiber (mainly its content of cellulose, hemicelluloses and lignin) in any forage species or hybrid greatly affects its digestibility of fiber and the other nutrients (protein, fat and carbohydrate) and energy utilization (Raharjo *et al.*, 1986). It is also worth notingy that the higher digestibilities of silage rations are probably due to the mutual positive associative effect among ingredients of these rations. In supporting to this point other mutual positive interaction effects of feed, Huhtanen (1991) indicated that digestible cellulose and/ or hemicelluloses had positive associative effect on the digestibility of the

rest of fiber constituents in the ration. Lastly the lower percentage of CFM in silage rations (50%) alleviated its negative effect on the digestibility of forage – CF, in relation to the higher CFM that involved in CR which reached to (60 %). Negative associative effects occur most often when the level of concentrate supplementation is high, leading to reduced digestibility of forage (Huhtanen, 1991).

Regarding feeding values of experimental rations, presumably both trends and values of nutrient digestibility over treatments were ultimately reflected on its TDN values. The significant higher values respecting TDN were with silage rations R_1 and R_3 and significantly followed by R_2 and then CR. Inverse trend among treatments was recognized with DCP (Table 4). Such effect is greatly due to the markedly lower CP content in silage rations vs. clover hay ration.

Feed intake:

The daily feed intake values, as DM, TDN or DCP (Table 6} were lower with CR group than those of R_1, R_2 and R_3 groups, with no significant differences among all treatments. This may be probably due to the more palatable of sorghum silage, in comparison of clover hay. Consistent with earlier findings, Bendary and Younis (1997) concluded that inclusion of green maize silage in a ration could cause a number of beneficial effects (succulent, better utilized by animals and contained suitable amount of carotene). On the other hand, Yacout (2001) found that intake by lambs of DM, TDN and DCP were significant increased in response of addition 1 % urea at ensiling time of corn stover in comparison with the free one.

Growth performance:

The daily gain was closely comparable among different treatments (Table 6). However, the differences among treatments regarding the digestibility of most nutrients were significant. These results could be explained by the fact that, in addition of digestibility effect, there are interaction effects between the components of the diet in which the utilization of ME can be changed up and down and these interactions cannot be easily predicted by any of the current feed evaluation systems (Huhtanen, 1991). The author added that metabolically partitioning of energy (e.g. body tissues vs. milk, protein vs. fat accretion) is crucial in effectiveness and determining animal performance. Furthermore, manipulating the proportions of absorbed nutrients or by a number of growth and production – promoting substances, can change partitioning of nutrients. On the other hand, although the accompanied CFM percentage with clover hay portion in CR was higher (60 %) than that with silage rations in R1, R2 and R3 (50 %), the difference in daily gain was not influenced between them. This means that the inclusion of sorghum stover silages in tested rations could save a significant amount of CFM.

The values of growth rate obtained here are similar to that reported by Mostafa *et al.* (2000) who worked with lambs and corn stover silage which prepared with urea and molasses supplements. Regarding the variety effect of sorghum Stover silages, results here are in harmony with those obtained by Chiariotti *et al.* (2009) who found lack effect among sorghum variety silages respecting growth rate in buffalos.

Table (6): Effect of feeding tested diets on lamb's performance.

Item	Treatments				
	CR	*R*[1]	*R*[2]	*R*[3]	Sig.
Initial LBW(Kg)	20.8	20.6	20.2	20.4	
Final LBW (Kg)	37.2	37.2	36.4	36.8	
Total gain (Kg)	16.4	16.6	16.2	16.4	
Daily gain (g)	137	138	135	137	
Daily DM intake per head (g) from:					
FCM	818	606	608	557	
Clover hay	517	-	-	-	
Sh-2 hybrid silage	-	939	-	-	
ICSV –273 silage	-	-	932	-	
Dorado silage	-	-	-	852	
Total DM Intake	1335	1545	1540	1409	NS
TDN intake, g /h/d	840	1110	1070	1000	NS
DCP intake g/h/d	130	152	152	143	NS
Feed conversion:					
Kg DM intake Kg/ Kg gain	9.74	11.20	11.41	10.28	NS
Kg TDN / Kg gain	6.13[b]	8.04[a]	7.92[a]	7.30[a]	

a, b means in the same row with different superscripts differ significantly (P< 0.05).

Concerning the feed utilization, the best-feed conversion ratio was recorded for lambs on CR diet (9.47 Kg / Kg gain), rising up to (10.28 – 11.41 Kg DM/ Kg gain) for the silage rations, however, these differences were not significant. Similar trends were observed with Kg TDN per Kg gain, with significant differences (P<0.05) between control and tested rations only regarding Kg TDN/Kg gain. The superiority of feed efficiency with CR group may be probably due to the higher CFM percentage compared with silage ones and also for the more balanced energy – protein ratio in CR. ration. In supporting to the mentioned above, Mostafa *et al.* (2004) revealed that the high – energy rations, regardless of the level of feed intake, achieved more efficient feed utilization and better-feed conversion than the low – energy ones. Among silage rations, group R_3 appeared to be more efficient in its feed conversion parameter.

Concerning economical efficiency (Table 7), the cost of consumed feed (L.E) was markedly lower with silage rations compared to the clover hay one. Similar trend was observed with the feed cost per Kg of live body weight gain over the dietary treatments. Thus the economical efficiency was potentially in favor of silage rations, with very slight differences among them in this item. These results are in harmony with the findings of Abd El – Baki *et al.* (1989), Bendary and Younis (1997) and Mostafa *et al.* (2000) who decided that stover silage could be successfully used for feeding ruminants.

Table (7): Economical efficiency of experimental rations.

Item	Treatments			
	CR	*R*[1]	*R*[2]	*R*[3]
Av. Daily feed intake (Kg) as fed:				
CFM	0.915	0.680	0.680	0.625
Clover hay	0.575	-	-	-
Sh-2 hybrid silage	-	2.725	-	-
ICSV-273 silage	-	-	2.725	-
Dorado silage	-	-	-	2.725
AV. Daily gain (Kg)	0.137	0.138	0.135	0.137
Cost of consumed feeds (LE)	1.890	1.360	1.363	1.278
Feed Cost / Kg LBW gain (LE)	13.8	9.85	10.07	9.27
Economical efficiency	1.59	2.23	2.18	2.37

Based on market prices through 2009, the prices (LE / Kg) were CFM 1.5, clover hay 0.9, sorghum stover silage 0.125 and LBW, 22

CONCLUSION

Based on the findings of this study, it could be concluded that the silages of the three varieties of sorghum stover are valid substitutions for clover hay and / or some other medium quality roughages in sheep rations. Potentially it can be beneficial for smallholder's farmers during the period of forage scarcity.

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تأثير إستعمال سيلاج عيدان السورجم المجهز من ثلاثه أصناف مختلفة على أداء النمو والتسمين للحملان

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باستعمال ٢٠ حمل متوسط وزنها فى بداية التجربة حوالى ٢٠،٥ ك تم من خلال أدائها الانتاجى فى تجربة نمو وتسمين و أيضا من خلال تجارب هضم على الحملان ثم تقييم ثلاثة أصناف من سيلاج عيدان نباتات السورجم والتى تم سيلجتها مباشره بعد حصاد محصول الحبوب وذلك بالمقارنه بدريس البرسيم المصرى.

معاملات التجربة الغذائية:

تم تغذية الحملان فرديا على العلائق الأتية والمحسوبة طبقا لمقررات المجلس القومى للبحوث NRC عام ١٩٨٥:

١- ٤٠٪ دريس برسيم + ٦٠ ٪ علف مركز (عليقة ضابطه) .

٢- ٥٠ ٪ سيلاج عيدان السورجم صنف شندويل + ٥٠ ٪ علف مركز.

٣- ٥٠ ٪ سيلاج عيدان السورجم صنف VSCI-٢٧٣ + ٥٠ ٪ علف مركز.

٤- ٥٠ ٪ سيلاج عيدان السورجم صنف دورادو +٥٠ ٪ علف مركز.

أوضحت النتائج ان اصناف عيدان السورجم الثلاثة أعطت سيلاج جيد ذات صفات ومقاييس تخمرية تقع داخل المدى الطبيعى القياسى للسيلاج الجيد.

بالنسبة لمعاملات الهضم كان هضم الماده الجافة والعضوية والالياف الخام ومستخلص خالى الازوت أعلى معنويا فى علائق السيلاج عن عليقة دريس البرسيم (الكنترول) والعكس صحيح مع البروتين الخام. وبالمقارنه بين اصناف السيلاج الثلاثة كانت الفروق معنوية مع معظم العناصر الغذائية مع تفوق سيلاج صنف شندويل على الصنفين الأخرين. بالنسبة لهضم البروتين لم تظهر فروق معنوية بين الاصناف الثلاثة. وكان هضم مكونات جدر الخلية يسلك نفس إتجاه الالياف الخام.

وكان المتناول من المادة الجافة للغذاء ومعدل النمو اليومي متشابه ولا توجد فروق معنوية بين معاملات التجربة مع تحقيق أعلى كفاءه لتحويل الغذاء بواسطة مجموعه الكنترول وكانت الفروق غير معنوية بين أصناف السيلاج وكانت الكفاءة الاقتصادية الأعلى مع علائق سيلاج عيدان السورجم الثلاثة مقارنه بالكنترول.

و فى النهاية يمكن استخلاص أن أنواع السيلاج الثلاثة يمكنها أن تحل محل تبن البرسيم و/أو بعض الأنواع من الأعلاف الخشنة المتوسطة الجودة فى علائق الأغنام، و هذا يعتبر مربحا للمربى الصغير خلال فترة ندرة الأعلاف الخضراء.