

EVALUATION AND UTILIZATION OF RUMEN CONTENT FOR FATTENING OF NILI-RAVI MALE CALVES

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ABSTRACT

A metabolic trial was conducted at Buffalo Research Institute, Pattoki, in which 25 male buffalo calves were fed the diets having total mixed ration (100%TMR) (Tc), 70%TMR with 30% silage1 (T1), 70% TMR plus 30% silage2 (T2), 70%TMR with 30% silage3 (T3), and 70% TMR plus 30% silage4 (T4). The data thus obtained was statistically analyzed using one way analysis of variance (ANOVA) technique. Among the treatments containing ensiled rumen contents without molasses, feed efficiency was significantly ($P<0.05$) more efficient than those silages which were ensiled along with molasses. However, the DM intake was significantly ($P<0.05$) higher in control group and silage treated with molasses and urea. When means were compared there were significant differences among all treatments for DM intake and feed efficiency. Comparatively efficient TMR (1&3) are those which formulated with those silages (silage1&3) which do not contain molasses. TMR1 is the most economical and the best efficient TMR which is formulated with silage1 (containing just rumen content and wheat straw 50:50 without any treatment of urea and molasses). Even TMR formulated with silage1 is more efficient than control TMR and it also economical as compare to control TMR. It was concluded that rumen contents could replace 50% of conventional TMR without any adverse effects on health of buffalo calves.

Key words: Rumen contents, buffalo calves, Total mixed ration, Silage.

INTRODUCTION

Increased productivity depends upon the availability of balanced feed to all species of animals contributing food of animal origin and other precious products. At present, 121.1 million heads of animals in Pakistan annually require about 10.9 and 90.36 tons of crude protein (CP) and total digestible nutrients (TDN), respectively. According to estimates, Pakistan is deficient by 40 and 80 percent in forage and concentrate feeds (Pasha, 1998). It is assumed that if balance feed is provided to existing livestock of the country the production can enhance up 50%. Moreover, the production of nitrogen from food residues and animal waste by-products can play a key role in fulfilling the gap between demand and supply. Keeping in mind the current scenario, the recycling of slaughter house wastes, as feed for various categories of livestock has been a continuous subject of investigation and consideration (Akram, 1990). One possible cost effective protein source of slaughter house waste is the processed rumen contents. These waste materials, if properly treated can be useful for animals. In order to get the dried rumen contents, rumen contents are processed and solids are mechanically separated from the liquid, retaining the solids as animal feed. The dried rumen digesta obtained in this way not only serves as a feed nutrient, but also its recycling reduces disposal and environmental pollution problem (Swan, 1992). The dried rumen contents contain high fiber which tends to increase the total fiber content of the diet and is necessary for normal rumen functioning and animal health of ruminants. This improved performance could also be attributed to higher protein component because of partially digested feed protein material due to the influence of the microbial protein. The protein content in the bodies of microbes is then digested in the intestinal tract of the ruminants and absorbed there, thus fulfill the protein need of high producing animals (Boorman and Ellis, 1996). The primary aim behind the use of these by-products is to reduce the feed cost as well as to fulfill the protein demands of animals (Haapapuro *et al.*, 1997). Keeping in view the importance of rumen contents present study was planned to study the feasibility of using rumen digesta in animal feed. The main objectives of the present study was To study the feasibility of fattening male buffalo calves on diets having varying levels of ensiled rumen contents as a protein source.

MATERIALS AND METHODS

A metabolic trial was conducted with twenty five male buffalo calves initially weighing 80-160 kg. They were randomly divided into five groups A, B, C, D and E of five animals each. All the animals were treated for internal and

external parasites with Ivomec. The Treatments include Tc = Total mixed ration (TMR), T1=70% TMR1+30% silage1, T2= 70%TMR2 + 30% silage2, T3= 70%TMR3 + 30%silage3, T4 =70%TMR4+30% silage4

The composition of the TMR1, TMR2, TMR3, TMR4 and TMRc is given in table II and nutritional profile of each treatment group is given in the Table I. The first 15 days was the adjustment period. Two kg of green fodder was also fed to each animal to meet the carotene requirements. The daily intake was recorded by subtracting the refused feed from feed offered. The animals were weighed at the start of the trial and fortnightly during the trial. The following parameter were recorded, feed Intake (kg/day), weight gain (kg/day). The data of the both the silages were compared statistically using paired T- test. For the metabolic trial the data thus obtained was analyzed statistically using one way analysis of variance (ANOVA) technique. The significant differences between means were tested by Duncan's multiple range tests (Steel *et al.*, 1997).

RESULTS

Daily average DM intake: During whole period of fattening the daily average DM intake of all treatments T1, T2, T3, T4 and Tc were 5.23, 4.87, 4.83, 6.63 and 5.97 kilograms respectively (Table-II). Highest average daily intake of DM was observed in T4 followed by Tc that was 6.63 and 5.97 kg respectively. Lowest intake was observed by T3 followed by T2 and T1 that are 4.83, 4.87 and 5.23 kg respectively. There is statistical significant difference ($P < 0.05$) between T1 and T4, T1 and Tc, T2 and T4, T2 and Tc, T3 and Tc. Whereas T1, T2, T3 are non-significant to each others.

Average Daily Weight Gain: The daily average weight gain of the calves of each treatment T1, T2, T3, T4 and Tc during the whole fattening period was 0.71, 0.50, 0.63, 0.68 and 0.73 kg respectively (Table II). There was non-significant difference among all treatments. However the highest weight gain was observed in Tc followed by T1 that was 0.73 and 0.71 kg respectively with non-significant difference. The lowest weight gain was observed by calves of T2 followed by T3 and T4 that was 0.50, 0.63 and 0.68 kg respectively.

Overall Feed Efficiency of each Treatment: Feed efficiency of each treatment T1, T2, T3, T4 and Tc is 0.14, 0.10, 0.13, 0.10 and 0.12 respectively. The best feed efficiency is in T1 followed by T3 (Table II).

Table 1. Composition of total mixed ration (TMR)

Item	Inclusion percentage				
	TMRc	TMR1	TMR2	TMR3	TMR4
Maize	5.59	2.84	3.03	1.26	1.64
Rice polish	20	20	20	23	23
Sunflower meal	12.58	7.76	7.49	4.76	4.23
Maize gluten 30%	20	20	20	20	20
Wheat straw	31.73	9.3	9.38	10.87	11.04
Rumen content	30	30	30	30
Molasses	8	8	8	8	8
Mineral mixture	2	2	2	2	2
Vitamin mixture	0.1	0.1	0.1	0.1	0.1

No rumen content inclusion in the TMRc.

Table 2. Daily average DM intake of different treatment groups (Mean \pm S.E)

Item	T1	T2	T3	T4	Tc
DM Intake	5.23 ^a \pm 0.12	4.87 ^b \pm 0.12	4.83 ^b \pm 0.14	6.63 ^c \pm 0.18	5.97 ^a \pm 0.23
Total Feed Intake(Kg)	2354	2193	2175	2986	2687
Weight Gain	0.71 \pm 0.08	0.51 \pm 0.07	0.63 \pm 0.07	0.68 \pm 0.11	0.73 \pm 0.09
Overall Weight Gain	64.20 \pm 7.94	45.80 \pm 7.09	57.00 \pm 6.76	61.40 \pm 10.51	6.20 \pm 8.69
Total Weight Gain (kg)	321	229	285	307	331
Feed Efficiency	7.33	9.57	7.63	9.72	8.11

Each value represents the mean of five samples

DISCUSSION

DM Intake: This observation is in agreement with Juvanovic *et al.* (1977), who reported that rumen content containing TMR has more feed intake as compare to the control diet. Similar results were found by Esonu *et al.* (2006), who reported that there was more consumption of feed containing rumen content than control. Adeniji (2008), also prop up my results that that rumen content containing diet has more feed intake than control. But our results disagree with Abouheif *et al.* (1999), who observed a decrease in DM intake in rumen contents based diet as compare to other diets. Bolsen *et al.* (1996) reported a low DM intake of silage and explained that this was due to the presence of fermentation products in the silage. The results of the present study regarding DM intake were also supported by Salinas-Chavira *et al.* (2007), who found an increase in the DM intake by lambs fed dried pig manure (DPM) and dried rumen contents (DRC) as compared to control diet. Again Adeniji, (2008) found a significant increase ($p < 0.05$) in feed intake in early weaned piglets fed 20% (RCMM) rumen contents-maggot meal mixture.

Weight Gain: Present results bear a resemblance to to the Bolsen *et al.* (1996), who reported that weight gain of control is same to the treatments being fed on the different types of silages. He also observed non-significant difference ($p < .05$) between control and other treatments feeding on the different types of silages. Abouheif *et al.* (1999), reported that total of 45 lambs were allotted into three groups and used to evaluate the effect of dietary inclusion of RCB and rumen contents (0, 25 and 50%) on growth performance and carcass traits. Daily DM intake, final body weight, carcass weight and dressing percentage were not different among treatments. However, a result of Esonu *et al.* (2006) contradicts with the present study. He made experiment on the Hubbard broiler and found that weight gain was more in those broilers that were being fed on the diet containing various levels of dried rumen contents than control groups (0%). Salinas-Chavira *et al.* (2007), corroborates our results that examined the effects of diets containing dried pig manure (DPM) and dried rumen contents (DRC) on growth performance and carcass characteristics in lambs. Average daily gain (227, 209, 214 and 188g, respectively) were similar ($p > 0.05$) between groups.

Feed Efficiency: Present findings are same to the Boorman *et al.* (1996), who conducted the experiment to see the effect of different dietary inclusions of dried rumen content on the growth of Hampshire ram lambs and found that feed efficiency was better in the treatment that was on dried rumen content without molasses as compare to control group and other treatments. Furthermore Esonu *et al.* (2006) carried out a 28-day feeding trial involving 264, 5-week old Hubbard broilers and observed that FCR was less in broilers fed dried rumen digesta (DRD) at dietary levels of 15% as compare to other treatments and control group. Adeniji and Jimoh (2007), also reported similar findings that 15% rumen content fed chicks had the best ($P < 0.05$) feed-to-gain ratio of 3.8. The results of our experiment are also being corroborated by Salinas-Chavira *et al.* (2007) who examined the effects of diets containing dried pig manure (DPM) and dried rumen contents (DRC) on growth performance and carcass characteristics in lambs. He reported that Average daily gain (227, 209, 214 and 188g, respectively) and feed efficiency (5.37, 5.54, 5.44 and 6.02, respectively) were similar ($P > 0.05$) between control and other treatments

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