

Effects of Different Levels of Pumpkin (*Cucurbita pepo*) Residue Silage Replacement with Forage Part of Ration on Male Buffalo Calves Fattening Performance

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Abstract: An experiment was conducted to study the effects of replacing forage part of ration with different levels of Pumpkin (*Cucurbita Pepo*) Residual Silage (PRS) on fattening performance of male buffalo calves. Twenty Four calves with 203 ± 27.9 Kg of BW fed experimental diets in a completely randomized design with 4 groups and 6 replicates. The four groups (1, 2, 3 and 4) included 0 (control), 20, 40 and 60% replacement of forage part of ration with PRS, respectively in basal diet. The results showed that Dry Matter Intake (DMI) was not significantly different between the groups. The highest and the lowest DMI were shown at the groups 1 and 4, respectively. Daily Weight Gain (DWG) was not significantly different between the groups. The highest and the lowest DWG were shown at the groups 3 and 2, respectively. Feed Conversion Ratio (FCR) was not significantly different between the groups. But the best FCR was obtained at group 1.

Key words: Pumpkin residue, silage characteristics, finishing buffalo calves, DMI, FCR

INTRODUCTION

The use of agricultural residuals is often a useful way of overcoming the shortage of animal feedstuffs. Agricultural residuals obtained after harvesting of vegetables, fruits and crops. Crop residues are materials, which are generated after the crop has been harvested (Dixon and Egan, 1987). Major crop residues may include straws, stalks and cobs. Pumpkin Residue (PR) is a by-product remained after pumpkin seeds collection in a considerable amount. It is rich Carbohydrate substance and may be used as animal feed.

Using such by-products for animal feeding is a means of recycling which otherwise, if accumulated, might cause environmental pollution (Pirmohammadi *et al.*, 2006).

All of the *Cucurbita* sp. are annuals (Castetter and Erwin, 1927). *Cucurbita pepo* was domesticated in North America from wild *Cucurbita texana*, occurring in the south central USA and *C. fraterna*, occurring in northeastern Mexico. From archeological excavations in Mexico, domestication can be dated back to about 8000 BC. Squashes were introduced to Europe by returning Spanish explorers in the 1500's (Sauer, 1993).

In addition to the use of pumpkin and squash as human food, they are also used as livestock food, some cultivars much more than others. According to planted

area, Pumpkin residues production was expected to be 200000 tons in year 2004 in W.Azarbaijan - Iran. The fleshy and pulp portions of the pumpkin are one of the most palatable crop residues. There is little information available in Iran on the nutritive value of PRS for ruminants.

The objective of present study, was to determine the effects of different levels of PRS on male buffalo calves performance.

MATERIALS AND METHODS

A total of 24 male buffalo calves, initial age and weight of 12 mo and 203 ± 27.9 kg, were divided into four groups of similar mean live weight. In each group, six calves were randomly penned in individual stalls allowing for experimental feeding. Each group was randomly assigned to one of the four treatments.

Pumpkin residues were chopped in small particle size (2 CM) then 700 Kg of its mixed with 300 Kg of Wheat straw and ensiled with adding of the 100 L solution of 10 Kg urea and 50 Kg beet molasses in water. Experimental diets were based on the substitution of forage part with Pumpkin Residues Silage (PRS) at 4 rates including 0(control), 20, 40 and 60% (Table 1).

Table 1: Dry matter composition of experimental diets*

Ingredients	Level of substitution (treatments)			
	0%(control)	20%	40%	60%
Alfalfa	24.5	17.5	10	3
Pumpkin Residues				
Silage (PRS)	0	4.5	9.5	14
Wheat straw	18.5	21	23.5	26
Concentrate	57	57	57	57
Total	100	100	100	100
CP (%)	11.6	11.6	11.6	11.6
Roughage (%)	43	43	43	43
Concentrate (%)	57	57	57	57

*Ca, P, K, NaCl, trace elements and vitamins A, D and E were supplemented at concentrations to meet or exceed NRC recommendations

Feed Intake (FI) of the calves was recorded each day and live weight at 15-d intervals. Data relative to feed intake, live weight gain and feed conversion ratio were analyzed using GLM procedure based on completely randomized design using Spss software Ver 11.

RESULTS AND DISCUSSION

Average daily Dry Matter Intake (DMI) (Kg d⁻¹) is shown in Table 2. Dry matter intake was increased with increasing level of PRS among the diets. Lowest and the highest values were obtained in control and group 4 (60% PRS), respectively.

Daily Weight Gain (DWG) of experimental groups (Kg d⁻¹) as shown in Table 2 were not significantly different between the groups. Daily weight gain had no trend with increasing level of PRS among the diets. Highest and the lowest values were obtained in groups 3 and 2, respectively. Feed Conversion Ratio (FCR) values were not significantly different among the groups. Feed conversion ratio had no trend with increasing level of PRS among the diets. Highest values were obtained in groups 2 and 4 and the lowest in group 3, respectively.

Increasing trend in DMI with increasing level of PRS may partly be due to increasing the ADF content of rations which is the more effective DMI limiting factor of the animal and more palatability in our silage.

It is clear that reduction of the nutrient values of the diets due to PRS inclusion may lead to worse FCR in these

Table 2: Dry matter intake, daily weight gain and Feed conversion ratio of groups

Traits	Groups			
	1	2	3	4
Dry matter intake (Kg d ⁻¹ day)	6.248±0.323	6.440±0.597	7.415±0.340	7.723±0.363
Daily weight gain (g day ⁻¹)	0.760±0.095	0.688±0.096	0.801±0.056	0.793±0.037
Feed conversion ratio	8.8±1.4	9.6±0.8	9.2±0.5	9.6±0.7

diets and this trend was expected. Based on the results of this study It can be concluded that pumpkin residue could be ensiled with addition of wheat straw as an absorbent; beet molasses as fermentable additive and urea as nitrogen enrichment and used up to 14% of the finishing diets in ruminants. More investigation should be done by different chemical and physical processing of pumpkin residues and evaluate their nutritive values.

CONCLUSION

It may conclude that forage part of ration can be substituted with PRS at 60 % level with no negative effects on male buffalo calves fattening performance.

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