Tomato Pomace-Rice Straw Silage as Feed for Growing Cattle

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1. Introduction

In Ilocos Norte (Philippines), there are very distinct dry (October to May) and wet seasons (June to September) and the average landholding of farmers is 0.30 ha. The available feed from grasses, weeds, and crop residues on the farm are very limiting to feed one or two work animals throughout the year. Hence, the need to make optimum use of available crop residues and agro-industrial by-products.

Rice straw is available after the harvest season (September to November). This is poor quality roughage (92% DM, 3.3% CP, 1.5% ether extract and 32.8% crude fibre), coarse when dry and has very low voluntary intake when fed as is.

Tomato pomace is a by-product from the processing of tomato paste. This is available from January to April when the only thing that can be used as feed for livestock is dry and mature grass, containing 15% DM, 14.5% crude protein, 2.2% crude fat,

38.4% crude fibre, 30.2% nitrogen-free extract, 0.43% calcium and 0.30% phosphorus (Caluya and Sair, 1995).

Fresh tomato pomace would spoil in two days if exposed to the air, hence we tried to preserve this material by ensiling it with rice straw to possibly improve the acceptability and feeding value of these materials and also come up with a feed that could be used later.

2. Methodology

Rice straw was chopped (2-3 cm) and mixed thoroughly with the fresh tomato pomace in a proportion that would give a mixture containing 35% DM. This mixture was then packed tightly in a 200 l drum lined with foil (bags rejected from the paste factory) and kept in storage for the duration of the study, although feeding out commenced already after14 days. After the feeding trial, extra silage was kept for further observation.

The roughage ration was supplemented with a concentrate mixture composed of 75% rice bran, 23% copra meal, 1% salt and 1% lime at the rate of 1 kg per animal per day.

3. Results and Discussion

Table 1 shows that the quality of the silage deteriorated as the storage time increased. This could be due to poor storage conditions, i.e., cracks/holes in the foil lining the drum and exposure to the heavy rains that occurred in the 3rd month of storage.

Table 1. Quality of the tomato pomace-rice straw silage over time

CRITERIA	TIME OF OPENING AFTER ENSILING					
	14 days	**1 month**	**2 months**	**3 months**	**4 months**	**5 months**
Colour	Greenish yellow	Greenish yellow	Greenish yellow	Greenish yellow	brownish	brownish
pH	3.98	4.20	4.22	4.26	4.50	4.66
Acceptability	Very acceptable	Very acceptable	Very acceptable	acceptable	With leftover	With leftover
Presence/ absence of moulds	absent	absent	absent	On top only	On top only	On top only

Table 2 presents the performance of animals fed with varying levels of TPRSS. After 90 days of feeding, the animals fed with 50% TPRSS, had the highest weight gained, while those fed with 75% TPRSS had the lowest. In terms of feed consumption, it was observed that the intake increased with decreasing level of TPRSS in the ration with animals fed with 25% TPRSS taking in the highest amount and animals fed with 75% TPRSS taking the lowest.

Table 2. Performance of growing cattle fed with varying levels of tomato pomace-rice straw silage.

treatment	**total gain in weight, kg**	**average daily gain, kg**	**total feed consumption**	**feed efficiency**	**feed cost per kg gain in weight, p**
75% roughage + 25% TPRSS	49.33	0.55	469.09	10.79	14.96
50% roughage + 50% TPRSS	54.00	0.60	424.31	8.56	12.38
25% roughage + 75% TPRSS	33.17	0.37	408.71	17.57	16.93
cv %	22.76	21.81	12.81	5.30	25.85

From this, we can see that animals fed with 50% TPRSS were the most efficient, requiring 8.56 kg of feed for 1 kg weight gain. In terms of cost of feed per kg weight gain, animals fed with50% TPRSS incurred the least cost.

We could see the potential of ensiling rice straw or maybe other crop residues with tomato pomace, producing feed for growing cattle, especially during periods of feed scarcity. This type of silage could also be fed to other ruminants, i.e., buffaloes, sheep and goats. However, the kind of silo and storage should be improved to insure good quality silage over a longer period of time.

4. Conclusion

Ensiling may offer a way of preserving highly perishable feed materials and improving the feeding value of poor quality roughage in a place like Ilocos Norte. This is a potential additional feed resource for the smallholder livestock raiser. This may also be an opportunity to provide a better quality feed for ruminants and improve the production of these animals.

5. Reference

CALUYA, R.R. and R.R. SAIR. 1995. Exploratory trial on the feeding of tomato pomace to growing cattle. Paper presented at the 1995 Livestock and Forage Commodity Review. Ilocos Agriculture and Resources Research and Development Consortium. Don Mariano Marcos Memorial State University, Bacnotan, La Union. June 10-11, 1995. 6pp.