

The effect of molasses on the fermentation quality of wheat straw and poultry litter ensiled with citrus pulp

P.K. Migwi¹, J.R. Gallagher² and R.J. van Barneveld³

¹Egerton University, Animal Science Department, P.O. Box 536, Njoro, Kenya

²University of Adelaide, Animal Science Department, Roseworthy SA 5371

³SARDI, Pig and Poultry Production Institute, Roseworthy SA 5371. Present address: Barneveld Nutrition Pty Ltd, PO Box 42, Lyndoch SA 5351

Poultry litter and citrus pulp are useful cheap local sources of nutrients for ruminants, especially during drought periods. In contrast, molasses to be used in S. Australia has to be transported over long distances and is an expensive feed supplement. Studies were conducted to find out whether inclusion of molasses had any effect on the fermentation quality and potential nutritive value of silage when wheat straw and poultry litter were ensiled with citrus pulp. In a 4x2 factorial, randomised complete block design, four treatments containing wheat straw, poultry litter and citrus pulp respectively on DM basis with 0 and 5% molasses were prepared as follows: T1(75:25:0); T2(60:25:15); T3(45:25:30) and T4(30:25:45). Thoroughly mixed material of each treatment, 5–10 kg, were ensiled for a period of 60 days in 20 litre hard plastic container laboratory silos that were lined with a double layer of polythene bags.

Inclusion of 5% molasses when ensiling wheat straw and poultry litter with 0, 15, 30 and 45% citrus pulp had no significant effect on silage pH, neutral detergent fibre, acid detergent fibre, acid detergent lignin and *in vitro* OM digestibility. However, molasses resulted in a significant decrease in volatile fatty acids

including N-butyric acid. There was also a complete elimination of coliforms in all treatments, except in silage that had neither molasses nor citrus pulp. There was a significant difference in titratable acidity levels between silage with 0 and 5% molasses but this was only in silage with 30% citrus pulp.

As the proportion of citrus pulp in silage increased there was a very highly significant increase in silage acidity and also a decrease in pH, though there was no significant difference in pH between silage with 30% or 45% citrus pulp. There was a very highly significant increase in *in vitro* OM digestibility from 0.33 to 0.56 for silage with 0 and 45% citrus pulp respectively.

It was concluded that when wheat straw and poultry litter were ensiled with citrus pulp, the addition of molasses offered no significant benefit to offset the additional cost associated with its use. However, when no citrus pulp is included in the pre-mix, addition of some molasses would appear desirable, so as to stimulate favourable fermentation. This practice can produce silage that is safe from potentially pathogenic microorganisms such as coliforms and is potentially a useful feed resource for ruminants.