

due to supplementation with molasses, cotton seed cake and urea. Supplementation is one means of increasing nutrient supply to animals that are unable to consume sufficient nutrients as forage (Romney and Gill, 2000). This suggests that BBF can maintain milk production as well as contribute to the building up of the body reserve of lactating animals.

Conclusions

BBF can be used as feed for ruminants which can sustain growth and milk production.

References

- Ørskov ER 2000. The in situ technique for estimation of forage degradability in ruminants. In *Forage Evaluation in Ruminants Nutrition* (eds DI Givens, E Owen, RFE Axford and HM Omed) pp. 175–180. CAB international, UK.
- Pires AJV, Garcia R and Valadares Filho SC 2004. Degradability of sugar cane bagasse treated with anhydrous ammonia. *R. Bras. Zootec.* 33, 1071–1077. <http://www.scielo.br/scielo.php> (accessed on February 2009).
- Romney DL and Gill M 2000. Intake of Forage. In *Forage Evaluation in Ruminants Nutrition* (eds DI Givens, E Owen, RFE Axford and HM Omed), pp. 43–57. CAB International, UK.

doi:10.1017/S2040470010000828

Performance and carcass characteristics of lambs fed high moisture corn silage with soybean seeds, sunflower seeds or urea

Cloves Cabreira Jobim[†], Moysés Calixto Júnior and Antonio Ferriani Branco

Universidade Estadual de Maringá, Av. Colombo, 5970, 87020-900, Maringá – Paraná, Brazil

Introduction

Silage of high moisture corn using additives to increase nutritional value, especially in relation to crude protein and energy could give to farmers an alternative to commercial concentrates (Jobim *et al.*, 2009). This research was conducted to evaluate the effect of diets with high moisture corn that received inclusion of soybean grain, sunflower grain or urea as additive during ensiling over lambs performance.

Material and Methods

The performance of lambs was evaluated in a feedlot using a diet with corn silage and a concentrate based on high moisture corn grain with inclusion of soybean grains, sunflower grain or urea. Treatments evaluated were the following: high moisture corn silage (CG); high moisture corn silage with 20% of soybean seeds (CGSO); high moisture corn silage with 20% of sunflower seeds (CGSU) and high moisture corn silage with 1% of urea (CGU). The diet was composed of 50% roughage and 50% concentrate. A total of 32 crossbred lambs (Texel × Santa Ines) were used. Animals were slaughtered, carcass were weighted to obtain hot carcass weight (HCW) and then stored in a maturation chamber

Table 1 Initial live weight (ILW), final live weight (FLW), average daily gain (ADG), hot carcass weight (HCW), cold carcass weight (CCW), lost of weight by refrigeration (LWR), true yield (TY) and compacity carcass index (CCI)

Parameters	CG	CGSO	CGSU	CGU	Mean	P-value	CV (%)
ILW (kg)	19.40	17.62	19.42	18.56	18.71	0.26	24.33
FLW (kg)	32.07	31.86	32.67	32.43	32.25	0.54	4.17
ADG (kg)	0.23	0.23	0.24	0.24	0.24	0.18	16.65
HCW (kg)	14.35	14.08	14.80	14.40	14.41	0.84	6.17
CCW (kg)	13.73	13.70	14.44	14.12	13.99	1.76	5.12
LWR (%)	4.15	2.65	2.40	2.24	2.83	1.56	12.04
TY (%)	54.70	54.68	56.10	55.64	55.27	2.08	2.39
CCI (kg/cm)	0.218	0.226	0.231	0.234	0.227	1.57	6.78

CG = high moisture corn silage, CGSO = high moisture corn silage with soybean seeds, CGSU = high moisture corn silage with sunflower seeds and CGU = high moisture corn silage with urea. CV = Coefficient of variation.

[†] E-mail: ccjobim@uem.br

under 4°C over 24 hours. After storage of 24 hours carcasses were weighted again to obtain cold carcass weight (CCW) and to calculate lost by refrigeration. True yield was obtained by a relationship between HCW and shrunk weight at slaughter. Data were submitted to variance analysis and averages were compared by Tukey test at 5% of probability.

Results

There was no effect from types of high moisture corn grain ($P > 0.05$) over studied variables parameters. Lost of weight by refrigeration (LWR) showed an average of 2.8%, values considered normal (3.0 – 4.0%) by Sañudo & Sierra (1986). The results of this study show that high moisture corn grain silage with inclusion of soybean or sunflower seeds, or urea can be the main concentrate in lamb diets and performance is not affected. Table 1

Conclusions

The use of high moisture corn silage with inclusion of soybean seeds, sunflower seeds or urea as a concentrate to replace commercial concentrates in diets of lambs fed in feedlots is viable.

References

- Jobim CC, Silva MS and Calixto Junior M 2009. Challenges in the utilization of high moisture grains silage for ruminants. Proceedings from the International Symposium on Forage Quality And Conservation. Piracicaba, pp. 91–108.
- Sañudo C and Sierra I 1986. Calidad de la canal en la especie ovina. *Ovino* 1, 127–153.

doi:10.1017/S204047001000083X

Analysis of the mineral content of clays used for clarification in the oil industry and their possible incorporation in animal feeding programs

Arturo F. Castellanos-Ruelas[†] and J. Gabriel Rosado-Rubio

Facultad de Ingeniería Química. Universidad Autónoma de Yucatán, Mexico

Introduction

The acid-activation of bentonite by hydrochloric acid produces a bleached earth marked as "Tonsil". They are used in agriculture, building industry, ceramics, chemical industry, paints and varnish industry, purification and stabilization of vegetable oils, among others. In Mérida, Yuc., México, the oil industry uses four types of such clays to clarify cooking oils: Supreme (126 FF), Supreme (1200 FF), Actisil (220 FF) y Optimum (320 FF), (Sud Chimie, 2004). After being used by the industry, disposal of clays may become a problem of environmental pollution. An alternative use of these materials is, as mineral supplement in animal feeding programs. Therefore, the objective of this study was to assess the feasibility of using the wasted clays as mineral source for farm animals.

Material and methods

A study was carried out comparing the mineral content indicated on the label of the four types of clays used in the oil industry, with the tolerance levels of domestic animals (NAP, 2005), with emphasis on possible toxicity. Calculations also considered the tolerance levels of humans to heavy metals, since man is the final link in the food chain (Concon, 1988).

Results

Mineral content of clays as shown in their label, is found in Table 1, where animal tolerance level is also mentioned. The most valuable minerals for animal feeding purposes are Mg, K, Fe, Ca, Zn, Cu, Mn and Cr. Si is considered inert for animals, therefore even though its quantity in clays is very high, it doesn't seem to be risky to animal health, but special attention should be taken to avoid possible toxicity. Content of Al is also very high. As far as Pb, Hg and Sr, they can be dangerous since they are bioaccumulated both in animals and humans, however, their amount in clays is low and therefore they do not represent a potential hazard. Ni and As are also in low quantities. Cd level in clays, in most cases, is greater than the level of tolerance of the animals and it may be bioaccumulated, but is important to consider that tolerance level of humans is high (Alessio *et al.*, 1983). Therefore Cd content of clays can be considered safe in the food chain, since humans

[†] E-mail: cruelas@uady.mx