variance structure were used for comparing dependent variables between treatment groups. All 3 steroid treatment groups had increased serum glucose that returned to baseline by the end of the observation period. The group receiving 2 doses of isoflupredone acetate had a significant decrease in serum K concentration. A first-lactation cow from group 2 was recumbent with severe hypokalemia, on day 9 after enrollment. Fractional clearance rates for K did not differ among treatments. No other treatment effects on serum electrolytes were observed in this trial.

Effect of Forage and TMR Particle Size on Cow Health and Milk Components

G. Cramer, T. Duffield, D. Kelton
Department of Population Medicine
University of Guelph, Guelph, Ontario, Canada

Introduction

Particle size of forages and total mixed rations plays an important role in the health and performance of dairy cattle. Objective of this study was to determine the effect of forage and total mixed ration (TMR) particle size on various health and production parameters in Ontario dairy herds.

Materials and Methods

A total 202 Ontario dairy herds in 21 counties were selected. During spring 1999, 31 local veterinarians were asked to collect forage and TMR samples from their clients' dairy farms, and administer a questionnaire to collect information on dry-cow and milking-cow nutrition and feeding management. Using Ontario Dairy Herd Improvement services, production and health information was retrieved for these herds. All feed samples were sent to the University of Guelph, where particle size was measured using a Penn State Particle Size Separator. Subsequently, forage samples were classified as having low or adequate levels of particles on each screen, according to Penn State Particle Size Separator recommendations.

A total 91 herds returned forage samples with completed questionnaires. Of these, 79 fed haylage, 79 fed corn silage, and 57 fed a TMR. Table 1 illustrates the number of herds that had low particle size levels for each screen of the separator.

Results and Discussion

Table 1 illustrates that low particle size is more common in TMR diets and may be a consequence of diet preparation. No effect of particle size was found

Table 1. Low particle size based on Penn State Particle Size Separator recommendations

Screen		Top		Middle		Both Top and Middle	
		N	%	*N*	%	*N*	%
Haylage		***9***	**11.3**	***12***	**15.2**	***2***	**2.5**
Corn Silage		***10***	**12.7**	***5***	**6.3**	***2***	**2.5**
TMR	All Forages	***22***	**38.6**	***20***	**35.1**	***16***	**28.0**
	Normal Forages[1]	***12***	**38.7**	***8***	**25.8**	***5***	**16.0**

[1]Herds with normal particle size in their forages, but low particle size in their TMR (31 herds with normal forages going into the TMR)

on milk protein %, ketosis incidence or displaced abomasum incidence. However, particle size was associated with herd lameness incidence and mean herd milk fat percentage. When mean herd milk fat percent was assessed using a generalized linear model, herds feeding a TMR diet had significantly lower milk fat percentage than herds feeding a component diet (-0.11%, p=0.02). In addition, herds that had low fiber based on any screen for either haylage or TMR tended to have lower milk fat % (-0.09%, p=0.06). When herds were classified into low (<12%) and high (≥ 12%) lameness incidence categories, herds fed diets with low fiber on both of the top 2 screens, for either haylage or TMR, were at 3 times greater risk for high lameness incidence (p<0.05). These herds also were twice as likely to have a high incidence (>5 %) of abomasal displacement.

This data demonstrates that low effective fiber is common in Ontario dairy herds and is associated with depressed milk fat percentage and increased incidence of lameness.

Evaluation of the Sodium Supply with Biochemical Analysis: Influence of the Amount of Sodium Chloride Fed on Sodium Excretion

Eicher R.,* Fuschini E., Wanner M.,*** Rüsch P.,*** Martig J.***
**Clinic for Food Animals and Horses, University of Berne, Switzerland*
***Swiss Federation for Artificial Insemination, Bütschwil, Switzerland*
****University of Zurich, Switzerland*

Introduction

Sodium deficiency has been associated with such reproduction disorders as poor conception, irregular oestrus cycle, genital catarrh, loss of appetite, decreased milk yield and licking. Forages are generally poor in sodium, and supplementation with sodium chloride (stock salt) is necessary. Although requirements are well defined, situations with sub-optimal or insufficient sodium supply are not rare in practice. Furthermore, as sodium and potassium are antagonistically regulated, high dietary potassium can aggravate a situation with sub-optimal sodium supply.The purpose of this study as to evaluate the sodium supply in dairy herds with serum and urine analyses and compare different methods of evaluation. These biochemical findings were compared to the anamnestic declared amount of sodium chloride offered to the cows.

Materials and Methods

Blood and urine samples were taken in dairy cows from 29 herds. A total 334 blood and urine samples were taken, with mean sample size n=11 (s=4). According to the system of salt distribution and the daily amount of stock salt given, herds were split into 5 groups of supplementation: PORTION had three levels (10-20, 30-50, 70-100 gm salt/d) and ADLIBITUM had two levels (REG = regular, IRREG = irregular filling of the bowls or replacement of salt blocks). Serum and urine sodium (SENA, URNA) and potassium (SEK, URK) concentrations were analyzed. Furthermore, the urinary potassium / sodium ratio (KNAQUOT) was calculated. Differences among groups were tested with non-parametric tests (Kruskal-Wallis analysis of variance). Post-hoc test of pairwise differences was performed with the Mann-Whitney U-test, using Bonferroni correction for multiple testing.

Results and Conclusions

Groups 70-100 and REG had significantly higher URNA concentrations than the other groups ($p < 0.001$). Group 10-20 had significantly higher KNAQUOT values than all other groups, groups 30-50 and IRREG were intermediate, and groups 70-100 and REG had the lowest values. At the herd level, the 3 herds in group 10-20 were classified as deficient, and all herds in groups 70-100 and REG were considered sufficiently supplemented. In contrast, there was a large variability among