3.6 in week +2. Cows that did not have elevated NEFA pre- or postpartum or SCK had the lowest risk of LDA (0.8%) whereas cows that experienced all three risk factors had a high rate of LDA (12%). Among the 53% of cows with NEFA ≥ 0.3 mEq/L in week -1, there was a significant (P = 0.005) but modest increase in risk of RP (9% vs. 6%; RR = 1.6). Neither metabolite had a predictive univariable association with development of metritis.

Significance

These data confirm the associations of NEFA and BHB with health in the transition period and support their use as tools for monitoring or investigation of transition dairy cows. However, used alone, the positive predictive value of these associations is low, which is expected given the multifactorial nature of both RP and LDA.

The Use of Rumensin® Premix in Dairy Cows: Factors Influencing its Effects on Milk Production and Milk Fat Percentage

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Introduction

Monensin premix (Rumensin® Premix, Elanco Animal Health, Canada) has been approved in Canada for use in lactating dairy cows since 2004 at a dose range of 8 to 24 ppm (7-22g per ton). Several studies have found that monensin increases milk production and decreases milk fat percentage in lactating dairy cows. Recent research has found that some dietary factors influence the monensin effect on milk production and milk fat percentage. To assist bovine practitioners in making recommendations about the use of monensin in dairy herds, there is a need for knowledge about those dietary factors influencing monensin effects. The objectives of this project were to evaluate the effects of 16 ppm (15g per ton) of monensin on milk production (PROD) and milk fat percentage (MFP), and to find dietary factors influencing those effects.

Materials and Methods

A randomized field clinical trial was conducted using 49 Holstein dairy herds in Québec (Canada) between November 2005 and May 2006. The herd was considered as the unit of interest. Herds were balanced in two groups by milk production, housing system, feeding system and size of farm. Enrolled herds were followed for a 7-month period. Monensin treatment was allocated in a crossover design for each group. Monensin was added to the lactating dairy cow rations for a consecutive 3-month period within this time frame. No other source of monensin was provided during this trial. Diet composition and diet particle size evaluation (using the Penn State Particle Separator) data were collected on each farm every two months. Milk production and milk fat percentage data were from weekly averages of daily bulk tank data. Data were analyzed in linear mixed models where PROD and MFP were considered as outcome variables.

Results

The majority of the 49 herds were fed a total mixed ration (n=30; 61%) and were housed in tie-stalls (n=42; 86%). Mean herd size was 73 cows (min: 40, max: 175). Overall monensin effect on PROD was not significant

(+0.08 liter/cow/day). However, herds feeding monensin and having high nonfiber carbohydrates (NFC) level in diet (>41.0%) had an increase of PROD (+0.7 liter/cow/day). Monensin significantly decreased MFP (-0.16%). Some dietary factors had a significant influence on monensin effect on MFP. The decrease in MFP was smaller for herds that had a diet low in NFC (≤39.7%); had a high proportion of physically effective fibre in the total mixed ration (as determined by adding the results of the two top sieves of Penn State Particle Separator) (>45%); and who fed dry hay as first meal in the morning.

Significance

The results of this trial are consistent with previous studies and confirm that monensin lowers herd milk fat percentage at a dose of 16 ppm (15g per ton) in lactating dairy cows. No effect on PROD for monensin, as measured using bulk tank data, was found. Dietary factors influencing the impact of monensin on PROD and MFP were mostly related to carbohydrate and fibre levels in the diet. Those factors could be used for predicting potential effects of monensin in herds.

A Meta-analysis of the Metabolic Impacts of Monensin in Lactating Dairy Cattle.

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Introduction

Monensin shifts the microbial population in the rumen towards more gram negative bacteria, consequently changing rumen volatile fatty acid concentrations towards propionate and away from acetate and butyrate. Since the late 1980's there have been many papers published on the effects of monensin in lactating dairy cattle. Recently, approvals for use on monensin have been obtained in Canada and the United States, while the product has been available for dairy cattle in countries such as Mexico, Australia and New Zealand for many years. The impacts of monensin on energy metabolism, including effects on serum ketones, NEFA, glucose, and urea have not always been consistent. Meta-analysis is a useful tool that can be employed to both summarize effects across studies and to investigate factors explaining potential heterogeneity of response.

Materials and Methods

An intensive literature search and screening process yielded a total of 59 papers, abstracts, and trial reports containing useable data on monensin in dairy cows. Of these, 30 papers contained metabolic data. All trials included were randomized designs but were not necessarily blinded. Data from each trial contained in the papers was extracted to a database including the number of animals, mean, and standard error for each of the monensin and control groups. Other relevant data that were common to most studies such as dose, stage of lactation, dose delivery method, and diet type (pasture, forage, component-fed) were also extracted. Meta-analysis was conducted in STATA for monensin effects on blood/serum beta-hydroxybutyrate (BHB), acetoacetate, non-esterified fatty acids (NEFA), glucose, urea, cholesterol, insulin, and calcium.

Results

There was a total of 30 papers containing 45 trials with monensin and metabolic outcomes. Some studies contained a summary of one trial conducted on multiple trial sites whereas other studies reported multiple trials conducted at a single trial site. Over all the trials analyzed, monensin decreased serum or blood BHB (P=0.001), NEFA (P=0.006), and acetoacetate (P=0.003). In addition monensin increased blood glucose