(P<0.001). Sick cows had lower Alb, BUN, Glu and Chol and higher AST, BHB and NEFA compared to healthy cows in the FR period. Fresh cow Alb concentration was stratified into three groups: < 3.0 g/dl, 3.0 to 3.5 g/dl and >3.5 g/dl and associated with health status. Percent of FR cows experiencing a health event within each group was 67, 61 and 32%, respectively (P<0.02). Cows with CU Alb concentrations < 3.25 g/dl were 1.46 (P<0.04; 1.04-2.04 95% CI) times more likely to experience a postpartum disease event. Within FR cows, Chol concentration increased (P<0.01) with increasing Alb concentration. Cows with FR Alb concentration < 3.30 g/dl were 1.79 (P<0.003; 1.19-2.70 95% CI) times more likely to have a disease event. If NEFA values were >0.4 mEq/l in either CU or FR samples, cows were 1.57 (P<0.03) and 1.47 (P<0.04) times more likely to have a disease event, respectively. Disease risk was greater if NEFA concentration was >0.6 mEq/l at CU (1.69, P<0.02) and FR (1.85, P<0.0007) periods. No metabolites measured in the ED period were associated with disease risk.

Significance

Based on these findings, reference ranges for diagnostic interpretation of blood metabolite concentrations should be adjusted to time periods relative to calving. Interactions between time period and health status suggest prepartum blood metabolite concentrations may provide some indication to postpartum disease risk and can be useful as a herd monitoring tool. Preliminary data suggest Alb and NEFA concentrations in CU and FR periods can be used to predict potential disease risk.

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The Use of Decision Tree Analysis to Improve LDA Decision Making

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Introduction

In food animal practice, medical decisions are usually made on the basis of economic impact to the dairy, rather than on perceived individual animal value or emotional attachment. A decision routinely made on dairies is what to do with cows that develop left displaced abomasums (LDA). Given the variety of management options available, veterinarians have the potential to make different recommendations depending upon the cow's historical value, parity, current stage of lactation, presence of concurrent disease, level of milk price and relative replacement cost. Decision trees are systematic quantitative tools that may be used to improve the ability to select the best course of action in situations, such as LDA, where the clinical decision is complex and outcomes are uncertain. The objective of this project was to demonstrate the use of a decision tree model as a tool to help select between surgery, roll and toggle or marketing for beef as the most economically appropriate management plan, given an early lactation cow with an LDA.

Materials and Methods

The LDA decision tree was designed using Microsoft Excel and Precision Tree, an Excel add-in tool that is available from Palisade Software. Assumptions used in the model included: a veterinarian performs the procedure and probabilities for recovery, death and culling were taken from the literature as well as from communication with herdsmen and veterinarians from the local area; costs for surgical intervention, therapy, and follow-up, as well as prices for replacement heifers, market cows and milk were based on current market prices in California; and that marketed cows are immediately replaced with an early lactation primiparous cow. Present value for a cow was based on her time-adjusted future predicted income over feed cost using parity-based culling risks, herd-specific reproductive efficiency, previous and/or future predicted individual cow milk production data, current feed cost estimates and predicted milk prices. Therefore, the model is examining the predicted value of the animal that might potentially occupy that cow-slot on the dairy by looking at the value of her

future contributions as well as the cost and value of her replacement, if she is removed from the herd.

Results

Under the assumptions used in the model, milk price, parity, cow relative value and replacement cost were the primary decision drivers. During times of low milk prices, replacement animals must produce more marginal milk to cover her replacement costs and each individual animal merits more investment from a medical and management perspective. First- or second-lactation animals are generally wiser economic choices for surgical management as compared to more mature cows, due to the longer predicted time available to recoup the cost of the intervention. Older, more mature animals should generally be culled instead of attempting surgery, except for extremely high-relative-value animals. In most cases, there is little economic difference between surgical intervention and roll and toggle for correction of LDA. Of course, under field conditions, prognosis for successful outcome will vary depending on the experience and expertise of the veterinary surgeon, the presence of concurrent disease, duration of the displacement and aftercare provided by the dairy. Each of these factors must be considered in evaluating risk vs benefit. Previous periods of high milk prices created conditions favoring more aggressive culling and made the higher predicted lifetime production of the new replacement animal even more valuable. However, during tight economic times of low milk prices and high replacement costs, dairymen should be more willing to invest more in surgical correction for LDA's.

Significance

The decision regarding whether to invest more medical management dollars into an individual animal must consider not only her past performance, but her predicted performance as well as the cost associated with replacing her. Younger cows are better candidates for surgical correction of LDA, while older or lower-value animals often should be replaced, depending upon prognosis for successful economic recovery, cost of her replacement and current and future milk prices.

Pharmacokinetics of Parenteral Vitamin E in Peripartum Dairy Cows

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Introduction

Supplementation of peripartum dairy cattle with parenteral vitamin E has been reported to decrease the incidence of retained placenta and metritis. Our objective was to compare the effect of one subcutaneous (SC) or intramuscular (IM) injection of vitamin E on plasma and neutrophil α-tocopherol concentrations.

Materials and Methods

Cows and heifers in two research herds (n=46) were enrolled. Cattle were fed a total mixed ration based on alfalfa and corn silage including 750 IU/d of supplemental vitamin E. Ten days before expected calving, animals were randomly assigned to receive one injection of 3000 IU of RRR-alpha-tocopheryl acetate IM or SC, or an IM saline placebo. Blood samples were collected immediately before treatment and then three times per week for three weeks. Blood (50mL) was collected from the coccygeal vein into tubes with EDTA, and then chilled. Plasma was harvested and cholesterol and α-tocopherol concentrations were determined. Cholesterol concentrations were used as a surrogate measure of availability of lipoproteins for α-tocopherol transport. In a subset of animals (n=15) neutrophils were isolated, re-suspended in saline with 1% pyrogallic acid, and frozen. Both plasma and neutrophil α-tocopherol concentrations were measured with a standard HPLC technique. Effect of treatment was analyzed with multivariable linear regression accounting for repeated measures (Proc Mixed in SAS). Covariates included parity, body condition score at enrollment and occurrence of retained placenta.

Results

Overall, IM (n=14) and SC (n=17) groups had higher ($P < 0.01$) plasma α-tocopherol concentration than control (n=15) cows (2.51, 2.77 and 1.66 μg/ml, respec-