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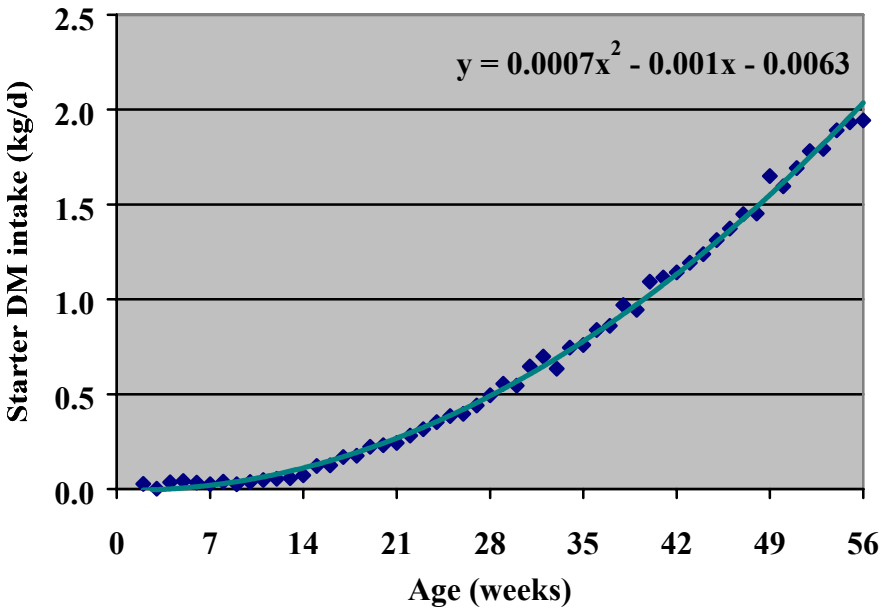
Calf Note #58 – Predicting calf starter intake in Holstein calves

Introduction

Intake of calf starter is critical to ensure adequate ruminal development and growth during the first few months of life. There are many factors that can influence calf starter intake and, therefore, predicting the amount of starter that a calf will consume at any time will be difficult. Some of these factors that influence starter intake include:

- breed and size of the calf
- age
- intake and type of liquid feeds preweaning
- incidence of scours and disease
- rate of daily gain
- starter formulation (palatability, ingredient selection)
- management (hay, feed policy)
- availability of water
- environmental temperature and housing

Predicting intake of commercial calf starters has been accomplished. The following study describes one such effort. Calf starter DMI records from two experiments conducted in 1992 and 1993 at the Martin Experiment Station, Martin, TN, were used to develop a regression equation to predict daily starter DMI in calves fed calf starter and commercial milk replacer. Calves (n = 85) were fed reconstituted commercial milk replacer 2x/d and commercial calf starter (40 calves) or commercial starter plus preweaning supplement (45 calves) for approximately 54 d. Intake of milk replacer (0 to 0.86 kg of DM/d) and calf starter (0 to 4.2 kg of



DM/d) were measured daily. Mean age at initiation of the studies was 6.3 d and ranged from 2 to 11 d of age. Calf BW, daily BW gain, age at initiation of the experiment, sex of calf (0 = heifer, 1 = bull), age of calf (d), experiment (0 = 1992 experiment, 1 = 1993 experiment), BW at initiation of the study, milk replacer DMI and appropriate squared terms were regressed on daily starter DMI. Regression procedures included step-wise regression and general linear models. Prediction equation was: starter DMI (kg/d) = -0.031 + 0.018 x age (d) - 0.0001 x age 2 + 0.191 x BW gain (kg/d) + 0.031 x BW (kg) + 0.0001 x BW 2 - 0.859 x milk DMI (kg/d) - 0.082 x sex - 0.043 x experiment - 0.026 x initial BW (kg). All terms in the model were significant ($P < 0.001$) except intercept ($P > 0.10$). The regression equation accounted for 84% of variation in daily starter DMI. Milk replacer DMI had the most negative effect on starter DMI and daily BW gain had the largest positive effect on starter DMI. Starter DMI can be predicted with reasonable accuracy in young calves.

The figure above is the regression of starter intake on calf age, which was the most significant variable in the full regression (note: each data point in the figure is the mean age and starter intake of 85 calves). Age is highly correlated with body weight and energy requirement. This curve indicates that starter intake become measurable beginning between 7 and 14 days of age. By looking at the figure, we can predict when calves will consume sufficient starter to allow them to be adequately weaned. If we use the "rule of thumb" that calves should be weaned when they consume 1 kg (2 lbs.) of starter for 2 consecutive days and assume that calf starter is approximately 12% moisture, then calves would be ready to wean at 37-38 days.

Predicting starter intake on an individual farm will probably differ from that of the regression equation or figure. However, these data can give you an indication of the potential for intake in calves.

Written by Dr. Jim Quigley (15 September 1999).

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