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Dairy

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FREQUENT CHANGING AND RINSING OF DRINKING WATER BUCKETS IMPROVED PERFORMANCE OF HUTCH-REARED HOLSTEIN CALVES

There is often great variation in the cleanliness of drinking water provided to hutch-raised calves. Due to the relationship between dry matter intake and water intake, low water quality in the calf hutch could reduce feed intake and daily gain, and possibly affect health status of the calves. The objective of this study was to compare the performance of hutch-reared calves when drinking water containers were changed/rinsed with decreasing frequency. For three consecutive years, 24 Holstein bull calves (2-7 days of age) were purchased each year from a single commercial dairy. Calves were purchased in four sets of six calves each in September, December, March and June of each year. Calves remained in the hutches for 60 days, receiving milk replacer twice daily. A concentrate mix was available at all times. Of the six calves in each set, two had their drinking water buckets rinsed daily, two were rinsed at 7-day intervals and two at 14-day intervals. Average daily gain (ADG) of calves was measured during the 60-day period while in hutches, and through a subsequent 100 to 110-day post-weaning feeding period.

The frequency of changing/rinsing drinking water buckets affected ADG of calves while in the hutches: daily, 1.55 lb (0.70 kg)/day; 7-day, 1.48 lb (0.67 kg)/day; 14-day, 1.40 lb (0.64 kg)/day. All means were different ($P < 0.05$). These differences in ADG carried over through the post-weaning period: daily, 3.12 lb (1.42 kg)/day; 7-day, 3.01 lb (1.37 kg)/day; 14-day, 2.90 lb (1.32 kg)/day. The daily and 14-day treatments were different ($P < 0.05$), while the 7-day treatment was intermediate. Calves assigned to the daily and 7-day changing/rinsing regimen required a similar number

(1.25) of medical treatments while in the hutches ($P < 0.05$). When drinking water buckets were changed/rinsed at 14-day intervals, calves required 1.75 medical treatments, an increase of 40%. Calves on the 14-day regimen were 2.48 (95% CI: range 1.32 to 4.68) times more likely ($P < 0.01$) to receive more than one treatment, compared to calves on daily and 7-day changing/rinsing regimens. Thus, a seemingly minor management practice such as frequency of changing/rinsing drinking water buckets in calf hutches can have an impact on calf performance and health.

These data clearly show that changing/rinsing of drinking water buckets for calves in hutches should not exceed 7 days. Extending the changing/rinsing interval to 14 days resulted in reduced performance, not only during the hutch phase but also through the next 100 to 110-day growing period. Overall daily gain and sale weight were reduced by 7.7 and 6.3%, respectively. Medical treatment rates were also increased by 40%.

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IMAGING STUDY OF MYRINGOTOMY IN DAIRY CALVES

Otitis media is common in dairy calves. Antibiotic treatment alone does not always result in complete resolution. Based on human pediatric medicine experience, where myringotomy tubes are commonly placed to drain purulent accumulations from the ear, it has been suggested that a myringotomy can be performed in calves. We investigated whether performing a myringotomy using a straight rigid instrument (knitting needle) is anatomically feasible in calves. Two imaging techniques and direct visualization were used to observe the trajectory of the needle and its immediate effects on the tympanic membrane. Our

study shows there is no anatomic impediment to performing a myringotomy in calves with a straight rigid instrument.

Our study confirms that there is no apparent anatomical impediment to performing myringotomies with a common-use instrument like a knitting needle. Furthermore, this study implies that a myringotomy may be effective in allowing drainage of middle ear contents both through the external ear and into the pharynx. Studies in live animals are needed to evaluate if purulent material of thick consistency, like that caused by *Mycoplasma* spp infections, can be effectively drained through the eustachian tube by opening a vent with the myringotomy. Clinical signs should improve after a myringotomy by decreasing the pressure that the purulent material applies onto the tympanic membrane, and therefore decreasing pain. As this purulent material drains from the infection site, it should promote faster healing. Further controlled experimental studies are needed to evaluate whether myringotomies can aid practitioners in treating calves that have otitis media by shortening the time of treatment and improving the clinical outcome.

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THE TUBERCULIN TEST

Tuberculin tests in general use today rely on the response to intradermal injections of tuberculin with assessment of the injection site for swelling at 72 hours post injection. Estimates of the sensitivity of tuberculin tests range from 68-95% while specificity is estimated to be 96-99%. The sensitivity of the test is affected by the potency and dose of tuberculin administered, the interval post-infection, desensitization, deliberate interference, post-partum immunosuppression and observer variation. Specificity is influenced by sensitization as a result of exposure to *M. avium*, *M. paratuberculosis* and environmental mycobacteria and by skin tuberculosis.

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CASE REPORT-BIOHYDROGENATION OF CONJUGATED LINOLEIC ACID (CLA) AS A PROBABLE CAUSE OF MILK FAT DEPRESSION IN A DAIRY HERD

Milk fat depression (MFD) is a common nutritional disorder on commercial dairy farms. Subacute rumen acidosis (SARA) secondary to inadequate effective fiber is traditionally one of the first areas to investigate when consulting with these herds. A less frequently recognized cause of MFD is the presence of unsaturated oils in the ration, which can have an indirect effect on milk fat synthesis.

One of the predominant fatty acids produced in the rumen is conjugated linoleic acid (CLA). Under certain altered rumen fermentation processes, the biochemical pathway produces an increased amount of the *trans* vs. the *cis*-isomer of CLA. These *trans*-isomers of CLA are potent inhibitors of milk fat synthesis. This case report will detail the process by which there is diet-induced milk fat depression despite adequate forage intake and apparent normal rumen health.

In dairy herds where milk fat depression is an issue, nutritional factors causing subacute rumen acidosis are most commonly implicated as the cause of altered rumen microbial processes. It must be recognized, however, that high concentrate rations or other feeding issues, such as ration sorting or "slug feeding", that affect rumen health are not the only cause of altered rumen microbial processes.

It is probable that other factors on an individual dairy affect passage rate or other aspects of rumen microbial processes that alter biohydrogenation pathways to form intermediates that are potent inhibitors of milk fat synthesis. The classical sequela related to ruminal acidosis may, therefore, not be recognized in the presence of depressed milk fat. Nutritional factors other than those suggested of causing low ruminal pH, such as the presence of unsaturated oils in the ration, must be investigated when consulting in herds with a history of milk fat depression.

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PARTICLE SIZE EVALUATION AND ITS ASSOCIATION WITH FEED INTAKE, MILK YIELD AND CHEWING ACTIVITY IN MID-LACTATION HOLSTEIN COWS

The objective of this study was to determine the associations among fresh and residual fractions of a total mixed ration (TMR), milk production and ruminating proportion of mid-lactation Holstein cows. During March 2002, daily representative TMR samples were collected at 8:00 a.m. from freshly delivered feed on a Holstein dairy in Florida. A sample of the residual feed (weigh-back) was collected at 7:30 a.m., corresponding to the weigh-back of the previous day. Samples were processed daily within 15 minutes of collection. Feed intake (as-fed), maximum and minimum temperatures of the day and individual milk yield were recorded daily. Each day, four hours after the 8 a.m. feeding (12 noon), numbers of cows ruminating and eating were counted. Particle size was evaluated using the Penn State particle size evaluator with three sieves. Dry matter (DM) content of each fraction was evaluated by using a microwave technique. Regression models for different out-comes were conducted. Models were developed using fractions as-fed and as DM basis.

Differences in DM content between coarse and medium size were not statistically significant. For all models, predictors were the same for both as-fed basis and DM basis. For dry matter intake (DMI), the only significant predictor was the minimum daily temperature, with a negative association. No variable was associated with weigh-back coarse fraction. However, when coarse and medium fractions were pooled as one fraction, maximum temperature of the day and DMI were predictors of this new outcome. For medium weigh-back fraction, significant predictors were fresh medium fraction proportion and DMI. Dry matter intake was negatively associated with medium fraction proportion. The proportion of cows ruminating was positively related to the proportion of cows eating four hours after fresh feed was placed on the feed bunk. Milk yield was

negatively associated with the medium fresh fraction proportion of the day before.

Coarse plus medium weigh back fractions were predicted by maximum daily temperature and DMI. Coarse fraction variability was not associated with any of the explanatory variables used in the studied models. Weigh-back medium fraction was predicted by fresh medium fraction and DMI. Milk yield was related to fresh medium fraction. The proportion of cows ruminating four hours after feeding was associated with the proportion of cows eating four hours after feeding. As a practical conclusion, when using the particle size evaluator, dry matter content of the TMR does not affect the interpretation of the results, and medium fraction proportion is inversely related to milk yield of the following day.

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THE EFFECTIVENESS OF DRYING OFF INDIVIDUAL QUARTERS AS A TREATMENT FOR MASTITIS

Numerous therapies have been proposed in the treatment of mastitis but few reach more than 60% success rate. This paper describes the reported effectiveness of drying off individual quarters because of unresponsive recurrent mastitis or persistent high cell count. All quarters had been previously treated unsuccessfully. A total of 125 quarters were dried off, with an average of 66% returning to expected production in the next lactation. Milk samples were taken from 30 quarters that had returned to production in the next lactation. In these, 16 had cell counts of below 200,000 and only 3 cultured positive for major pathogens. The technique has several advantages as a treatment. The cow can be kept in milk, albeit on three quarters, there is a considerably reduced risk of the spread of infection to other cows, the bulk milk presented for sale is not down graded due to increased cell count and Bactoscan.

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