UNIVERSITY OF FLORIDA
Institute of Food and Agricultural Sciences

Dairy Update

Department of Animal Sciences

Quarterly Newsletter **Summer 2001**

MYCOTOXIN SURVEY

Mycotoxins are toxins produced by molds. They are costly to the dairy industry in terms of reduced performance and animal health problems. The Florida Department of Agriculture and Consumer Services performed a survey of mycotoxins in dairy feeds on Florida dairy farms in February through September of 1999. The 69 samples included hominy, ground corn, soybean meal, cottonseed, cottonseed hulls, grass hay, alfalfa hay, grass silage, and mixed concentrates. The samples were tested for aflatoxin, deoxynivalenol (DON or vomitoxin), and fumonisin. For aflatoxin, only 1 sample (cottonseed hulls) had greater than 20 ppb (parts per billion), which is the legal limit for aflatoxins in the entire ration. Ten other feeds had traces of aflatoxin, but most were below the 1.0 ppb detection limit.

Traces of DON were found in 33 samples. These 33 samples averaged 1.9 ppm (parts per million) with none greater than 6.6 ppm. Most of the samples were below the detection limit of <0.5 ppm. The average amount found in the feeds was below levels that have occasionally shown problems in research trials. DON itself doesn't always cause problems in cattle, but it has been suggested that it is a marker for the presence of other mycotoxins.

Fumonisin was found in only 3 samples, and it averaged 10.3 ppm in those samples. That is approximately one-tenth the level of fumonisin that reduced milk yield in dairy cows in one research study.

BOTTOM LINE:

Florida's dairy feeds look fairly safe for animal and human health from a mycotoxin standpoint.

HOWEVER…

To keep the chance of mycotoxin problems low:

-Buy mycotoxin-free feeds

-Keep dry feeds dry so they don't mold

-Pack, store, and feed silage so it doesn't mold.

--MBH

CURRENT DHIA STATISTICS

A quick summary of herds on test in Florida revealed that production is down from last year. Both daily production and rolling herd average are down for DHIA herds. Average herd size is up by 35 cows and % dry cows is up by 1.5%. A good measure of production for year-to-year comparison is ***standardized 150-day milk***. These data show a 6-pound

difference from May 2000 to last month. Feed cost numbers are similar for the two years.
--DWW

CURRENT FLORIDA DHIA SUMMARY FOR MAY

ITEM	2001	2000
AVG NO. COWS	647.33	613.60
% COWS IN MILK	88.58	90.00
ROLLING HERD AVERAGE	16980.5	18936.0
MILK LBS / COW *	57.82	63.30
AVG LACTATION STAGE - DIM	211.98	213.10
STANDARDIZED 150-DAY MILK	64.1	70.0
FEED COST / COW..$*	3.48	3.67
AVG MILK PRICE REPORTED	16.91	14.78
FEED COST PER CWT MILK $*	5.88	5.79
TEST DAY/BULK TANK DEVIATION %	1.52	2.42
TD / BULK TNK DEVIATION-LBS/COW	0.99	1.36
% HEATS OBSERVED	39.3	31.0
AVG DAYS TO 1ST BREEDING	100.5	93.0
AVG SCC SCORE	3.4	3.7

* for MAY 2001.

MILK CHECK-OFF REPORTS

CITRUS VS. HOMINY: HOW DO THEY AFFECT HOW WE MEET A COW'S PROTEIN NEEDS?

M. B. Hall

Often, dairy cattle fed rations higher in citrus pulp produce less milk than cows fed more hominy or corn meal. Research done in Wisconsin comparing citrus and high moisture shell corn rations showed that cows on citrus rations

gave more milk and more milk protein if they were fed more bypass protein. Why did this happen? If we understand the differences between citrus and corn that cause the production differences, we can formulate rations that get the best performance and still let dairy farmers take advantage of the changing prices of commodities.

For citrus, a corn product, or any carbohydrate source to affect milk protein, they are probably changing the amount of microbial protein produced in the rumen. Microbial protein is an important source of protein that the cow uses to meet her requirements. We evaluated the yield of microbial crude protein from the fermentation of sugar, pectin, (both in citrus pulp), and starch (in hominy or corn meal) by rumen microbes in a laboratory experiment. We fermented bermudagrass neutral detergent fiber (NDF) by itself, and 60:40 blends of NDF and sucrose (sugar), citrus pectin, or corn starch for two 24 hour fermentations.

The carbohydrate sources differed in their peak yield of microbial crude protein, and pattern of yield over the 24 hours of the fermentation. At their greatest yields, starch yielded the most microbial protein, with pectin, sugar, and NDF having 88%, 75%, and 40% of the yield of starch. The protein yield from sugar peaked earliest at 12.5 hours, followed by 13.5 for pectin, 15.6 for starch, and 19.3 for NDF. The most rapidly fermenting carbohydrates peaked earliest.

After the microbial protein peaked for pectin, starch, or NDF, it then declined as the microbes died and the protein was broken down. The microbial protein in the sugar fermentations did not break down as rapidly after peak yield.

This work shows that carbohydrates can differ in the amount of microbial protein they provide. It suggests that part of the reason for lower milk or milk protein when higher levels of citrus are substituted for corn products may be due to less protein available to the cow. On total mixed rations, we should probably consider feeding more rumen bypass protein when we feed large amounts of sugar and pectin sources like citrus.

EFFECTS OF DRY PERIOD DRY MATTER INTAKE AND FORAGE PERCENTAGE ON PERFORMANCE OF DAIRY COWS POST-CALVING

**C. S. Holcomb, H. H. Van Horn, H. H. Head, M. B. Hall,
and C. J. Wilcox**

THE QUESTION:

Do different dry matter intakes or forage percentages of rations fed during the dry period affect how a cow will perform during lactation? Forty-one cows received one of four rations for an average of 25 d before calving. The rations were either high or low in forage, and were fed free-choice or the amount restricted to an offering of 18 lb DM/day. Soyhulls were added to the low forage rations to add fiber. All rations were formulated to meet the cows' nutrient requirements in the pounds of dry matter consumed. After calving, all cows were fed the same ration free choice.

Dry matter intakes before calving were 17.6 lb/day for restricted versus 27.3 lb/day for free-choice feeding with low-forage free-choice intake greater than that of high-forage free-choice (31.0 versus 23.5 lb/day). Rations fed during the dry period did not affect post-calving averages for dry matter intake, milk yield, milk protein percentage, body weight, body condition score, or plasma glucose concentrations. Overall means from 1 to 40 days-in-milk (DIM) were 46.4 lb/d for dry matter intake, 74.8 lb milk/day, 3.03% milk protein, 1373 lb body weight, 3.2 body condition score, and 66 mg/dl plasma glucose concentration. From 1 to 40 DIM, the change in intake and milk over time showed that dry matter intake and milk yield were slightly higher in early lactation for cows whose intake had been restricted before calving (Figure 1), but their average milk fat percentage was lower (3.10 vs 3.42%). Plasma NEFA (an index of how much body fat a cow is mobilizing) just before and after calving were higher and insulin lower in cows fed high-forage versus low-forage before calving, suggesting that the animals fed more forage were mobilizing more fat from their body reserves.

Although the data should be considered preliminary, high dry matter intake before calving, at best, showed no advantage over restricted feeding. In fact, there is the suggestion that restricted feeding before calving may be advantageous to cows postpartum because intake and milk yield both were slightly higher in early lactation with restricted feeding and restricted feeding of a low-forage ration with adequate fiber maintained lower plasma NEFA and higher insulin just before and after calving.

CONCLUSIONS

The results suggest that maximizing intake in the late-dry period is not as essential to post-calving performance as other factors must be for cows in relatively good condition whose nutritional requirements are being met. Thus, the modest decreases in dry matter intake that can occur when feed bunks are managed to minimize refusals or that may occur when anionic diets are fed in the close-up period may not have a negative impact on post-calving performance. Restricted feeding when bunk space is not adequate is NOT recommended. In that case, there can be a large chance that some animals will not get the feed they need

Although advantages were slight, the low-forage, restricted-fed ration offered before calving gave the best overall performance after calving, giving slightly higher intake and earlier peak milk yields while maintaining lower NEFA and higher plasma insulin over the transition from dry to lactating.

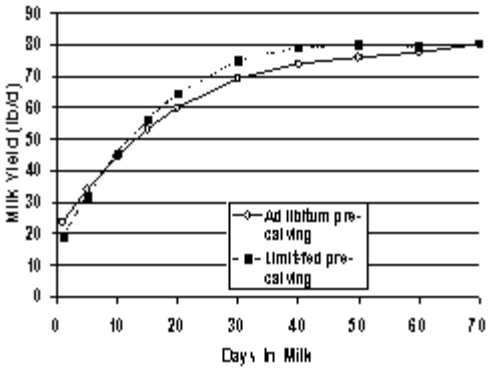

Figure 1. Milk yield by days in milk for cows fed feed free-choice (ad libitum) or limit fed before calving.

VARIABLE SPEED VACUUM PUMP CONTROL IN FLORIDA

DR. Bray and R. Giesy
Dept. of Animal Sciences, R.A. Bucklin, J. Leary, W. Porter, Agricultural and Biological Engineering Dept., University of Florida.

The use of Variable Speed Pump drives became popular in the later 90's. Some States even cost shared their installation on dairies to reduce energy consumption. Because of Florida's large herd size and Florida's extreme weather conditions we need to test these systems in Florida.

We selected a central Florida dairy with two identical and separate double 12 Herringbone Parlors, each with 15hp motors. One parlor was fitted with a variable speed controller (Vari-Guard) the other kept its present Sentinel 350 controller. Vacuum level, pulsation function has been measure over the years and there has been no difference between the parlor performances. The system has withstood Florida's heat, humidity, spiders, fire ants and pigeons.

The parlor with the constant speed pump used $4,916 per year in electricity costs. The variable speed drive used $2,212 per year in electricity costs. This was a savings of $2,704 per year.

Some Thoughts:

1. The larger the pump the larger the savings because if the vacuum is not needed the motor slows down and uses little energy.
2. You must have a sufficient pump horsepower to start with, especially if you use the 7/8" claws, which allow greater air admission during fall off.
3. These systems make sense in terms of high-energy costs.
4. These systems make big vacuum pumps quiet.