

Field Trials on Dairy Cattle

Canton, Texas

August, 1996

Reports of humates being included as animal dietary supplements have been cited in scientific literature and advertisements since the 1970's. Results from both hard scientific research and unsubstantiated advertisements have indicated positive results in animal health from a variety of non-specific humic substances. The purpose of this field trial was to reaffirm research reports using a specific humate available from Cretaceous formations in New Mexico.

Scientific literature indicated improvements in animal health, weight gain and milk production. Several of the scientific papers indicated humates were safe non-toxic substances that are normally ingested in trace amounts with normal diets of grasses and plants. To reaffirm the safety aspects of the humates, dairy cattle were selected for this test because the milk of lactating cattle will generally show irregularities quickly.

This test monitored volume and quality of milk production, lactation decline, feed intake, urine/feces and general health issues of a herd under hot humid stress causing conditions.

The Dairy

The dairy selected for this test was one recommended by the American Milk Producers Association in conjunction with a local nutritionist as a reputable business with an excellent record keeping history. The dairy was located in Canton (East Texas), Texas. Additionally the test was ran in July and August because of the hot humid conditions creating additional stresses on the animals. Milk production ranged in the 13,000 to 14,000 pounds per day. The dairy was found to be extremely clean and all animal areas were washed daily. Feeding was done twice daily and mineral supplements were administered with computer monitoring at each milking station.

The Herd.

The herd consisted of 535 Holstein cows averaging about 50 pounds of milk daily. The overall general health of the herd was excellent. The overall herd experienced 4 to 6 cases of mastitis (tit infection) daily. Once detected, the cow was given antibiotic and removed from the milking line for three to four days. Birthing rates were normal for high production cattle. A nutritionist proscribed the diet of the herd and the animals experienced weekly vet inspections. Milk was tested each day at the dairy and every other day by the purchaser. Lactation decline curves indicated an 8 percent decline. Discussions with the owner indicated normal cow production life to be approximately 4 years.

The Diet.

The diet was proscribed and monitored by a registered nutritionist. The diet base consisted of corn, coastal Bermuda and appropriate minerals packs for a high protein diet normal with high milk production cattle. Average feed ingestion of feed was approximately 38 pounds of nutrient daily. The average intake over at 5-year period ranged from 55 pounds daily in cold weather to 38 pounds in hot weather. Milk production varied proportionally with feed intake.

Humate Specifications

The humate used for this test consisted of fresh water humate from New Mexico containing 45.6% humic acid and 12.3% fulvic acid. Additionally the humate contained over 60 trace minerals in a phyto form.

Test Protocol.

Test protocol consisted of a two week monitoring time prior to the test, a four-week test period and a two-week post time on the entire herd. It was preferred to split the testing into a control herd and test herd, but due to existing logistics of the milking/feeding operations, it was impossible to perform. Therefore the above protocol was performed.

The test began July 25, 1996. Milk production was monitored over a two-week period to establish a base line and confirm the overall lactation decline rate. Average milk production from 292 cows for the pre-test time was 48.1 pounds of milk per animal. Lactation decline was 7.93%.

On August 6, 1996 humates were introduced into the diet at the rate of 1 ounce per 250 pounds of body weight. Each cow weighed approximately 1250 pounds, i.e. 5 ounces of humate daily. Close monitoring was performed for the initial period immediately after start up to determine time of initial effect. The humate was dosed daily for a period of approximately 21 days and ended on August 28.

Again the cattle and production were monitored closely to determine the after effects of the humate. After several days' transition, the production was observed to determine after averages and decline curves.

Test results.

	No. of Cows	Lb. Of Milk Per Cow/Day	% Decline
Pretest Averages (2 wk.)	292	48.1	7.93
Test (3 wk.)	287	50.4	2.46
Post Test (2 wk.)	275	47.3	7.42

Observations

Humate took 4 days to take effect at beginning of test. At end of test period, effects of humate ceased after 3 days.

Manure of both pre and post test contained particulate matter (pieces of corn and hay). Manure examined during testing period contained no particulate matter and consisted of a very fine textured material.

Urine of both pre and post test was amber colored with a notable ammonia order. Urine during the test period was clear with no odor.

Farmer noted an overall decrease in odor during the test period and a reduction in flies and insects.

Cows were much calmer during the milking while on the humate. During the pre and posttest times, they consumed feed very aggressively; during the test time they leisurely consumed feed.

Blood samples indicated higher proportions of amino acids during testing time.

Skin and Coats improved during the testing time. Eyes looked brighter. More lanolin was observed in coat during testing time.

No changes in milk chemistry were observed during entire test. One could not tell when the humate began or the humate ceased.

Mastitis cases dropped from 4 to 6 per day to 4 total during the testing period. This is interesting because microbial levels increased in the milk during the test portion. Increasing levels of microbes generally indicate increases in mastitis.

Calving after the tests was normal. Calf sizes were slightly larger than normal.

Breeding and impregnation after the tests were normal.

Conclusions.

The introduction of humate into the diet produced 1.9 pounds of extra milk daily per animal. Milk butter fat percentages showed no change. The feed consumption dropped from 38 lb. per day to 36 pounds per day during the test. At the conclusion the test period, consumption returned to 38 lb. per day. With the

changes in the manure to a fine texture, it can be concluded that the animal was digesting its nutrient more completely, thus creating greater milk production.

Additionally the humates produced a calming effect on the animals as exhibited by aggressiveness in eating and reduced the effects of heat stresses produced by summer temperatures. These factors also increased milk production.

Lactation decline curves were dramatically flattened which will provide additional total cumulative milk production per animal. Days of lactation were broken into 50-day periods and the animals of each group were examined. Animals in the first 90 days of lactation showed no change. Animals from 90 days to 200 days showed increases of 0.75 to 1.5 pounds per day increase. Animal over 200 days exhibited up to 3 pounds per day increases. Several animals lactating over 350 days showed increases of 5 lb. per day.

Environmental concerns from the animal wastes were reduced significantly. Less volumes of manure and reductions in ammonia odor results in less waste and reduces the effects of potential insect born diseases.

Future Research.

The test results from this trial raise several additional studies as follow up. The results suggest

1. The total days of lactation can be increased as a result of the reduced lactation decline curve. Future studies need to be performed over long term to document this theory.
2. The typical production life of this herd was 4 years. This study suggests that the reduction in stress on the animal and better consumption of nutrient would extend the number of years of production. Future studies need to be performed to document this question.
3. Literature and results of this test regarding better utilization of nutrient by the animal suggesting better weight gain by the animal per unit of feed intake. This would result in getting an animal into production faster and for beef cattle, faster market weight and reduced feed costs.