BIO VET Direct Fed Microbials for the Millennium and Beyond ...

Effects of Generator™ Direct Fed Microbial on Milk Production of Commercial Dairy Cows

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INTRODUCTION

Dairymen that feed Generator™ Direct Fed Microbial blends to their lactating dairy cows report positive results. The objective of this study was to quantify milk production responses of cows fed Generator™ versus control cows from the same herd that did not receive a direct fed microbial.

MATERIALS AND METHODS

Split herd trials were conducted on seventeen commercial dairies. Well managed herds were selected on the basis of: a) milk production, b) monthly DHIA reporting on individual cows including days in milk, pounds milk, percent fat and percent protein, c) ability to split cows such that days in milk was approximately equal, d) feeding constant ration during the month preceding trial and entire trial period, e) not using rBST, f) not feeding a direct fed microbial (yeast culture was fed in one herd), and g) ability of the dairy to simultaneously feed two groups of cows, treatment and control.

One herd was a rotationally grazed pasture fed herd. All other herds were fed stored feeds. Rolling herd average ranged from 17,230 pounds to 25,330 pounds for stored feed fed herds. The rotationally grazed herd rolling herd average was 16,047 pounds. The mean rolling herd average was 20,301 pounds for all herds.

Ration forages primarily consisted of alfalfa silage or hay and corn silage. Grain was predominantly corn. Minerals and supplemental commercial protein mixes were also fed according to herd nutritionists' recommendations.

DHIA records were obtained prior to the start of the trial. Treatment cows were fed Generator™ Direct Fed Microbial according to label directions in addition to the base ration that was fed to the control cows starting the day after DHIA testing and continued until the following monthly DHIA test. Cows that had all information necessary on DHIA records at both the start and end of the trial were included in the data. Production records for 903 Holstein cows were corrected for fat and protein and adjusted for days in milk using the formulas:

FPCM = (#milk x 0.337) + (#milk x 0.116 x % fat) + (#milk x 0.06 x % protein)

And

ACM = (0.432 x #milk) + (16.25 x #milk x % fat) + (0.0029 x #milk x (DIM – 150))

Where

FPCM = Fat, Protein Corrected Milk
ACM = Adjusted Corrected Milk
DIM = Days in Milk

Changes in Adjusted Corrected Milk (ACM) levels from the start to end of the feeding trial were used to compare 17 herds representing 444 treatment cows to 459 control cows. Data from the herds showing a positive response was compiled and summarized to obtain higher cow numbers for stage of lactation analysis. Three stages of lactation were defined: a) less than 100 DIM,

b) 101 to 200 DIM, and c) over 201 DIM. Stage of lactation was determined by the cow's DIM at the end of each trial.

Herd characteristics and trial data are reported in Tables 1 through 3.

RESULTS

Cows in 11 of the 17 herds showed a positive response to Generator™ feeding.

Positive Response Herds

The 11 herds showing a positive response represent 235 treatment group cows and 231 control group cows.

The mean change in ACM was 3.01 pounds per cow higher for treatment group cows compared to control group cows over the trial period.

Individual dairy farm mean changes in ACM ranged from 0.67 pounds to 6.26 pounds higher for treatment group cows compared to control group cows.

Mean changes in milk fat production from the beginning to the end of the trial was 0.15 pounds per cow higher for treatment group cows compared to control group cows for all cows in the trial.

A small advantage in mean milk protein production change (+0.02 pounds per cow advantage for treatment cows) was noted.

Mean change in ACM was 2.05 pounds per cow higher from the start to the end of the trial for 57 treatment group cows compared to 52 control group cows that were less than 100 DIM. Mean change in milk fat production was 0.23 pounds per cow higher from the start to the end of the trial for 57 treatment group cows compared to 52 control group cows that were less than 100 DIM. Data shown in Table 2.

Mean change in ACM was 0.32 pounds per cow higher from the start to the end of the trial for 94 treatment group cows compared to 84 control group cows that were between 101 and 200 DIM. Mean change in milk fat production was 0.09 pounds per cow higher from the start to the end of the trial for 94 treatment group cows compared to 84 control group cows that were between 101 and 200 DIM. Mean change in milk protein production was 0.05 pounds per cow lower from the start to the end of the trial for 94 treatment group cows compared to 84 control group cows that were between 101 and 200 DIM. Data shown in Table 2.

Mean change in ACM was 5.83 pounds per cow higher from the start to the end of the trial for 84 treatment group cows compared to 95 control group cows that were over 201 DIM. Mean change in milk fat production was 0.16 pounds per cow higher from the start to the end of the trial for 84 treatment group cows compared to 95 control group cows that were over 201 DIM. Mean change in milk protein production was 0.13 pounds per cow higher from the start to the end of the trial for 84 treatment group cows compared to 95 control group cows that were over 201 DIM. Data shown in Table 2.

Treatment group cows from individual herds showed both increases in milk production from the start to end of the trial as well as less decline in production as compared to control group cows.

All Herds

The mean change in ACM for all herds, including positive, non– and negative response herds was 1.70 pounds per cow higher for treatment group cows compared to control group cows over the trial period.

Individual dairy farm mean changes in ACM ranged from –1.37 pounds to +6.26 pounds for treatment group cows compared to control group cows.

Mean change in milk fat production from the beginning to the end of the trial was 0.08 pounds per cow higher for treatment group cows compared to control group cows for all cows in the trial.

Virtually no difference in mean milk protein production change (+0.01 pounds per cow advantage for treatment cows) was noted. Data shown in Table 3.

DISCUSSION

Feeding Generator™ Direct Fed Microbial improved adjusted, corrected milk production and milk fat content of cows when comparing changes in production parameters reported from DHIA records at the start and end of the trial period.

Experimental design for this trial was chosen to eliminate variables such as ration changes, weather and other environmental factors that are commonly present in on – off – on or other similar long term trial designs. Using change in Adjusted Corrected Milk from the start to the end of the trial allowed comparison of cows that were both increasing and decreasing in milk production during the trial period segment of lactation.

Herd means were used to compile data for all stages of lactation. This minimizes effects of cow number differences in the various herds.

Individual cow data was used for stage of lactation comparison, so more effect on performance of herds with larger numbers of cows is likely. This method was used because certain herds had either no or single animals representing a group within a stage of lactation.

Any cows in these herds receiving rBST were eliminated from the trial. The trial design would not be able to determine which production responses resulted from BST and which from feeding Generator™.

The factors necessary to make the trial design work are especially suited to smaller dairy farms. This limits cow numbers enough to prevent drawing meaningful conclusions from any individual farm. When the data of several farms are compiled, a more quantitative summary is possible.

Meaningful data from this trial is limited to the following: 1a) in herds showing a positive response, mean adjusted corrected milk production change from start to end of the trial was 3.01 pounds higher for cows receiving Generator™, 1b) mean adjusted corrected milk production change from start to end of the trial was 1.70 pounds higher for cows receiving Generator™ across all herd trials; 2a) in herds showing a positive response, mean milk fat production change from start to end of the trial was 0.15 pounds higher for cows receiving Generator™, 2b) mean milk fat production change from start to end of the trial was 0.08 pounds higher for cows receiving Generator™ across all herd trials; 3) most notable positive changes in production parameters were present in early and late lactation cows
fed Generator™.

As with all feeding changes, not every individual cow or herd responds favorably. In this trial, 11 of 17 herds showed a favorable response. Industry wide, the milk response to feeding Generator™ would be economically advantageous to the dairy even if historically low milk prices are present, and economics improve as milk prices increase. Milk production numbers alone justify feeding Generator™ to all moderate and high producing dairy cows.

For herds that will show a positive response, dairymen could expect an average of about 3 pounds more milk compared to not feeding Generator™. The milk production advantage for feeding Generator™ may be either an increase in production or a less dramatic drop in production during periods of milk production decline (i.e. summer heat stress).

CONCLUSIONS

Feeding Generator™ Direct Fed Microbial improved adjusted, corrected milk production from the start to the end of the feeding trial of treatment group cows compared to control group cows in 11 of 17 split herd trials. For the seventeen split herd trials, the mean improvement in ACM was 1.70 pounds for cows fed Generator™. In the eleven herds showing a positive response, ACM was improved by 3.01 pounds per cow for cows fed Generator™. Milk fat production was improved by 0.15 pounds per cow for cows fed Generator™ compared to the control group in herds that showed a positive response.

Table 1. Data for 11 Split Herd Trials with Positive Response (mean data for herds)

Herds	Mean Rolling Herd Average	Total Number of Treatment Cows	Total Number of Control Cows	Mean Per Cow Lbs. ACM Change Difference (treatment vs. control)	Mean Per Cow Lbs. Fat Change Difference (treatment vs. control)	Mean Per Cow Lbs. Protein Change Difference (treatment vs. control)
11	**20759**	**235**	**231**	**3.01**	**0.15**	**0.02**

Table 2. Stage of Lactation Data for 11 Split Herd Trials with Positive Response (individual cow data compiled and summarized by stage of lactation)

	Number of cows	Difference in Change of ACM (Generator™ fed cows vs. control cows)	Difference in Change of milk fat pounds (Generator™ fed cows vs. control cows)	Difference in Change of milk protein pounds (Generator™ fed cows vs. control cows)
< 100 days in milk				
Generator™ fed cows	57	2.05	0.23	-0.00
Control cows	52			
101 - 200 days in milk				
Generator™ fed cows	94	0.32	0.09	-0.05
Control cows	84			
> 201 days in milk				
Generator™ fed cows	84	5.83	0.16	0.13
Control cows	95			

Table 3. Data for All Split Herd Trials – Positive, Non- and Negative Response (mean data for herds)

Herds	Mean Rolling Herd Average	Total Number of Treatment Cows	Total Number of Control Cows	Mean Per Cow Lbs. ACM Change Difference (treatment vs. control)	Mean Per Cow Lbs. Fat Change Difference (treatment vs. control)	Mean Per Cow Lbs. Protein Change Difference (treatment vs. control)
17	**20301**	**444**	**459**	**1.70**	**0.08**	**0.01**