



Effects of Zymace[®] vs. Amaferm[®] Supplementation on Production Performance of Mid-Lactation Dairy Cows

You may be asking, what is Zymace[®], and why use it? Zymace[®] is an all-natural prebiotic that is designed to maximize digestibility of feeds and increase rumen microbial growth, allowing for maximum forage use and lower feed costs. Getting the most out of feed, efficiently and economically, is a constant topic of discussion, we battle the issue on farm, many different ways, such as hybrid selection, timing of harvest, lab analysis and feed additives. Whether that is at the time of ensiling or added to the diet at time of feeding. Zymace[®] was developed to combat the issues by being incorporated into the TMR. Knowing that this is a well-researched field, trials have been conducted to demonstrate the efficacy of the enzyme. The trial showcased in this Profit Edge was conducted by phdR&D comparing two sources of *Aspergillus oryzae* 458; Zymace[®], a registered trademark of R&D LifeSciences, LLC and Amaferm[®], a registered trademark of BioZyme, Inc. on mid-lactation dairy cows.

EXPERIMENT DESIGN

The study involved 54 multiparous mid-lactation Holstein cows maintained at the phdR&D research facility in Southern Wisconsin. Animals were on test for 63 days beginning in late winter through early spring while fed a standard commercial ration for lactating dairy cows. Animals were blocked by parity, stage of lactation, milk production and bodyweight then randomly assigned to one of six free-stall pens. After a 7-day covariate period, two dietary treatments assigned at random to 3 pens were fed for 49 days; 1) Amaferm[®] Lot # 15294 at a feeding rate of 5g/hd/d (n=27) and 2) Zymace[®] Lot # 15317 at a feeding rate of 5g/hd/d (n=27). At the conclusion of the treatment period, animals were offered a standard commercial ration omitting either treatment for a 7-day washout period.

Measurements of dry matter intake (DMI) and milk production were recorded daily. Milk samples were collected weekly and analyzed individually for fat, protein, and lactose percentages, SCC, and MUN by AgSource DHIA Laboratories. Energy



corrected milk yields were calculated each week based on component results using the following formula $ECM = (0.323 \cdot m_1 \text{ yield}) + (12.81 \cdot m_1 \text{ butterfat}) + (7.13 \cdot m_1 \text{ protein}) + (0.323 \cdot m_2 \text{ yield}) + (12.81 \cdot m_2 \text{ butterfat}) + (7.13 \cdot m_2 \text{ protein}) + (0.323 \cdot m_3 \text{ yield}) + (12.81 \cdot m_3 \text{ butterfat}) + (7.13 \cdot m_3 \text{ protein})$, where m_1 =morning milking yield, m_2 =afternoon milking yield and m_3 =night milking yield. 3.5% Fat corrected milk yields were calculated each week based on component results using the following formula $3.5\% \text{ FCM} = (0.432 \times \text{milk yield}) + (16.23 \times \text{milk fat yield})$. Body weights and fecal samples were collected prior to treatment and during the last week of treatment supplementation.

Data was compiled by averaging data for all the cows in a pen. Linear mixed models were fit, with a separate model for each response and analyzed using the MIXED procedure of SAS. ANOVA was used for parameters measured only during the washout period. Cows that did not complete the whole study were removed entirely.

RESULTS

Study results summarized in Table 1 demonstrate that Zymace® versus Amaferm® supplementation resulted no statistically significant treatment differences in measured production parameters. In addition, body weights, starch, protein, rumen and post-rumen digestibility were similar between treatments. However, Zymace® fed cows had increased ($P=0.01$) fecal pH by +0.2 compared to Amaferm® (Figure 1).

During the washout period when animals were on the same basal herd ration, all

production parameters continued to show no treatment differences.

DISCUSSION

Controlled research studies have demonstrated that the active ingredient in Zymace® (Aspergillus oryzae 458) aids with fiber breakdown and stimulates production of lactic acid-utilizing bacteria that help stabilize rumen pH. As a result, the hypothesis was fostered that these combined factors will enhance performance in dairy cows supplemented with Zymace®.

Study results supported this hypothesis by demonstrating that cows fed Zymace® exhibited a numerical increase of NDF, starch and rumen digestibility and significantly greater fecal pH. The enhancements in digestibility and pH are associated with greater DMI and milk production. The increase in fecal pH suggests that Zymace-fed cows had more extensive pre-gastric carbohydrate digestion, which agrees with the numerical increases in rumen starch digestibility data. Further, the increased fecal pH is indicative of a healthier intestinal barrier.

CONCLUSION

A 2-month controlled research study compared two sources of AO 458; Zymace®, a registered trademark of R&D LifeSciences, LLC and Amaferm®, a registered trademark of BioZyme, Inc. on mid-lactation dairy cows under commercial production conditions. Zymace® supplementation numerically increased some production variables vs Amaferm® and statistically increased fecal pH values, which is positively correlated with improved intestinal health.

In summary Zymace® appears to stimulate dry matter intake, via improving rumen digestibility resulting in more milk and component yield, while creating a stable intestinal environment conducive of better gut health.

The question to ask yourself is- with the economics of dairy, and more pressure put on farms to produce on less acres while also maintaining herd health and productivity, can you afford not to include Zymace® in your ration?

REFERENCES

1. Data on file. R&D Life Sciences®.

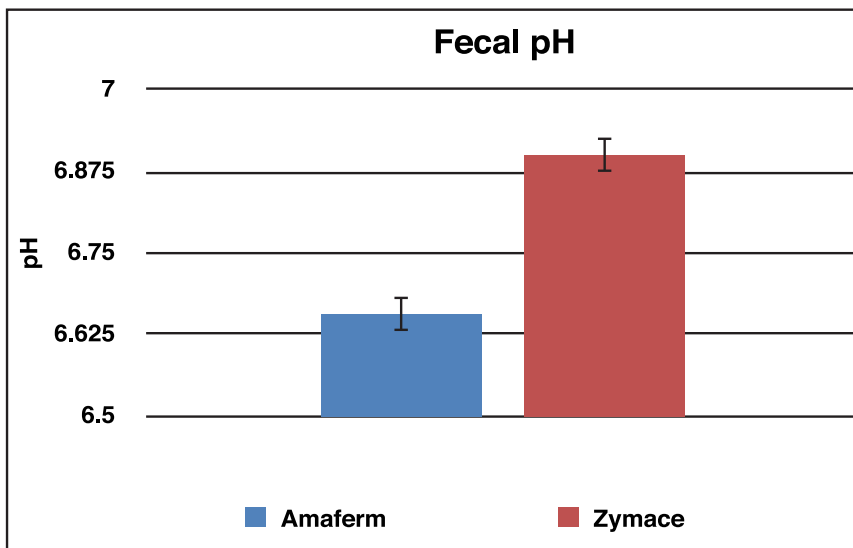


Figure 1. Fecal pH during the treatment period

Table 1. Effect of treatment on production parameters during the treatment period

Variable	Amaferm®	Zymace®	SEM	<i>p</i>
Fecal pH	6.7	6.9	0.04	0.01
Milk production lbs.	102.3	102.7	1.38	NS
Fat, lbs.	4.29	4.30	0.09	NS
Fat, %	4.25	4.28	0.05	NS
Protein, lbs.	3.32	3.41	0.055	NS
Protein, %	3.32	3.33	0.01	NS

(Table 1. continued)

Variable	Amaferm®	Zymace®	SEM	<i>p</i>
Lactose, lbs.	4.87	4.90	0.06	NS
SNF	9.14	9.23	0.10	NS
MUN	12.82	12.81	0.29	NS
ECM ¹	111.8	112.1	2.19	NS
3.5% FCM ²	113.8	113.8	2.18	NS
Log SCC x1000	4.96	4.70	0.12	NS
SCC	174.2	142.5	23.7	NS
DMI, lbs.	68.8	72.5	1.52	NS
Body Weight	1769.9	1771.8	10.86	NS
Starch Digestibility, %	96.6	97.0	0.59	NS
pdNDF Digestibility, %	52.43	57.59	2.85	NS
NDF Digestibility, %	34.35	37.51	1.60	NS
Protein Digestibility, %	65.41	64.14	1.69	NS
Rumen Digestibility, %	77.88	80.25	3.18	NS
Post Rumen Digestibility, %	18.8	16.9	2.55	NS

Table illustrates baseline covariate adjusted least squares means for each treatment, the standard error of the mean, and p-value for the overall treatment effect F-test.

¹Energy-corrected milk= (0.323 x milk yield) + (12.81x lb. fat) + (7.13 x lb. protein)

²Fat-corrected milk= (0.432 x milk yield) + (16.23 x milk fat yield)

³Feed efficiency= ECM/DMI

⁴Milk: Feed =Milk yield/DMI