

The Benefits of Prebiotics and Probiotics for Horses

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Can select prebiotics and probiotics help horses digest more efficiently?

Our research focuses on a single question: what's best for the horse?

That led us to investigate on the effectiveness of prebiotics (selectively fermented ingredients that feed microbiota) and probiotics (microorganisms thought to be beneficial to the host) on apparent digestibility of the total diet. The existing research was promising but inconclusive. So we conducted our own.

Our conclusion: *a carefully selected, thoroughly tested combination of prebiotics and probiotics can aid in nutrient digestion with discernible benefits to horses.* These benefits include the more efficient digestibility of nutrients from forage in the diet, specifically NDF (Neutral Detergent Fiber).

In other words, with the addition of prebiotics and probiotics, horses were better able to get more nutrition from the same feed

While a discussion of the general merits of the thousands of strains of prebiotics and probiotics tested in a variety of environments can yield conflicting conclusions, a consideration of carefully selected agents under relevant conditions supports clear benefits from use of these additives¹. (Morgan et al., 2007).

Ensuring viability

A dead probiotic is 100% ineffective. So our first priority was ensuring we were using those strains of probiotics that have been shown to survive the stresses of manufacturing, especially the heat of pelleting² (StarLabs PrimaLac Study #SL-01-1, 2003; Swyers, 2007; Swyers et al., 2008).

We carefully selected prebiotics and probiotics from suppliers who met exacting criteria: a decades-long commitment to research, in field, lab, and university environments, and a willingness to test their products in varied and extreme conditions over time.

Devising an equine-specific test

Dr. Josie Coverdale of Texas A&M University, in collaboration with Dr. Emily Lamprecht, conducted a study with the specific purpose of testing the efficacy of a feed additive containing prebiotics and probiotics in mature horses.

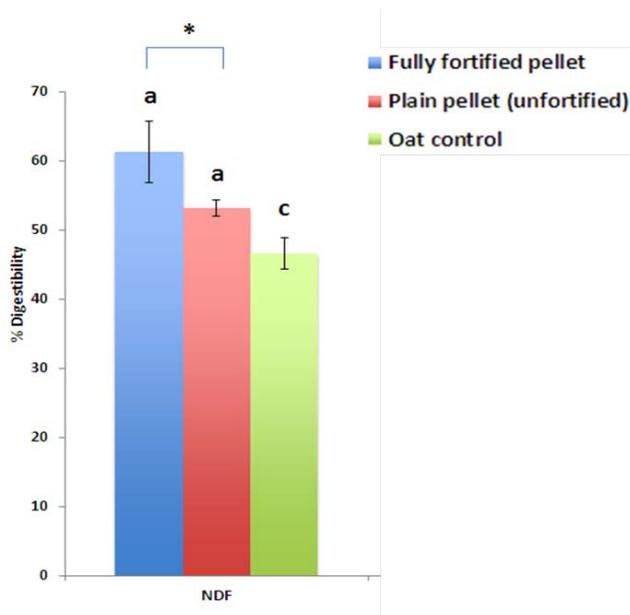
Current Nutrena premium equine feeds include carefully selected organic trace mineral complexes, prebiotics and probiotics. These ingredients had strong testimonial support and limited data, so we wanted to evaluate our own proprietary's blend's effect on apparent digestibility in horses.

It was also important to include a statistically relevant number of horses. Twenty-seven geldings were assigned to three treatment groups, 9 horses per trt group, in a randomized block design. Horses were fed whole oats, pelleted feed, or pelleted feed with a proprietary additive blend containing prebiotics and probiotics.

Their pelleted diets were isocaloric (the same amount of calories) and isonitrogenous (the same amounts of nitrogen). All three groups were also fed the same coastal Bermuda grass hay for the duration of the study. To prepare them for the trial, they were all provided a diet of unfortified pellets and grass hay for thirty days. They were given nineteen days to acclimate to their respective treatment diet and total fecal collections were conducted on days 20 – 23. Measurements included bodyweight, body condition score (BCS³; Henneke et al., 1983), % body fat⁴(Westervelt et al., 1976), total feed intake, and total fecal output. Hay, concentrate and fecal samples were analyzed for dry matter (DM), organic matter (OM), crude protein (CP), ADF, NDF, gross energy, and apparent digestibility of the total diet was determined⁵. (Coverdale et al., 2013)

The results

Treatments elicited differences in apparent digestibility of ADF and NDF dietary components. The data suggest:



Horses fed pellets with the additive blend demonstrated greater ($P = 0.13$) apparent digestibility of NDF and ADF compared to horses fed pellets without the additives.

Using pelleted ingredients vs. whole grains improves digestibility of dietary NDF and ADF components ($P \leq 0.05$)

There is a numerical change towards improved DM digestibility with fortification compared to unfortified diets.

Chart detail: Different superscripts indicate differences ($P \leq 0.05$) between treatment groups; an asterisk suggests differences ($P = 0.13$) between fortified vs. plain pellets – e.g., take 100 horses, 87% of time, we are confident that these results would be replicated.

Overall, data supports that horses given the specific additive blend containing prebiotics and probiotics in pelleted concentrate digested dietary fiber, including that in the forage – comprising the bulk of most common equine rations – more efficiently than those eating an unfortified pelleted concentrate plus hay or whole oats plus hay. This improved efficiency meant that they extracted more nutrition from the same relative fiber intake. This is part of the science behind Nutrena’s new exclusive Nutri-Bloom Advantage™ has been shown to support increases in dietary fiber digestion up to 15% for better health and bloom.

Conclusion

We began this paper with a straightforward question: What’s best for the horse?

Our answer is emphatic: Nutrena’s ongoing research has confirmed that, while claims about prebiotics and probiotics *generally* may not be definitive, *specific combinations* of prebiotics and probiotics can contribute to a discernible and positive difference in the well-being of animals and, particularly, horses. And the well being of horses is our mission. That is why we include prebiotics and probiotics in our feeds. That is why we refuse to accept “good enough,” and that is why we continue to invest in even better formulations.

¹ Morgan, L.M., J.A. Coverdale, M.A. Froetschel, and I. Yoon. 2007. Effect of Yeast Culture Supplementation on Digestibility of Varying Forage Quality in Mature Horses. *Equine Vet. Sci.* 27,6:260-265.

² PrimaLac Study #SL-01-1. April 2003. PrimaLac® Pet DFMs Remain Stable Through the Heat and Pressure of Extrusion. Star-Labs/Forage Research Inc. P.O. Box 6081 St. Joseph, MO 64506, USA.

²Swyers, K.L., 2007. Viability of lactic acid bacteria in animal feed during pelleting. MS Thesis. University of Maryland, College Park, MD.

²Swyers, K.L., A.O. Burk, T.G. Hartsock, E.M. Ungerfeld and J.L. Shelton. 2008. Effects of direct-fed microbial supplementation on digestibility and fermentation end-products in horses fed low- and high-starch concentrates. *J. Anim. Sci.* 86:2596-2608.

³ Henneke: Henneke, D. G., G. D. Potter, J. L. Kreider, and B. F. Yeates. 1983. Relationship between condition score, physical measurements and body fat percentage in mares. *Equine Vet. J.* 15:371-372.

⁴ Westervelt: Westervelt, R. G., J. R. Stouffer, H. F. Hintz, and H. F. Schryver. 1976. Estimating fatness in horses and ponies. *J. Anim. Sci.* 43:781-785.

⁵ Coverdale, J.A., E.D. Lamprecht, P. Kropp, I. Yoon, J.L. Lucia, K.N. Winsco, A.E. Hanson, and C.M. Warzecha. 2013. Influence of prebiotic and probiotic supplementation on apparent digestibility in mature geldings at maintenance. *J. Anim. Sci.* 91(E-Suppl. 2)