

# Prebiotics, Probiotics and Nutritional Aids in Horse Feeds

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## 1) What feeds include pre- or probiotics (or similar nutritional aids), and what role does the product play in improving horse health or feed efficiency?

Table 1 illustrates ADM Alliance Nutrition Equine Feeds and digestive aids. Natural-source vitamin E (d- $\alpha$  tocopheryl acetate) and ZinPro 4-Plex Equine are included as digestive aids because they may have synergistic effects with the other feed components. All of the listed products contain little or no cereal grain starches and are used in FORAGE FIRST<sup>®</sup> limited starch, total rations for horses.

**Table 1.** ADM Alliance Nutrition<sup>®</sup>-Equine products with digestive aids.

Product	Prospanse*	CitriStim**	PrimaLac*** <sup>£</sup>	Natural Vit E	4-Plex Eq <sup>€</sup>
GROSTRONG <sup>®</sup> Ultra-Fiber <sup>™</sup> Horse Feed	X	X		90 IU/lb.	
Patriot <sup>®</sup> Performance Horse Feeds	X	X		varies	
PRO-VITA-MIN <sup>™</sup> 20/5, 18/12 Tubs	X	X			
JUNIORGLO <sup>®</sup>	X	X	X	250 IU/lb.	X
PRIMEGLO <sup>™</sup>	X	X	X	334 IU/lb.	X
POWERGLO <sup>®</sup>	X	X	X	250 IU/lb.	X
SENIORGLO <sup>®</sup>	X	X	X	250 IU/lb.	X
GROSTRONG <sup>®</sup> Mintrate <sup>®</sup>	X	X	X	500 IU/lb.	X
StaySTRONG <sup>®</sup> Metabolic Mineral Pellets	X	X	X	500 IU/lb.	X
ShowBoost <sup>®</sup>	X	X	X	500 IU/lb.	X
MOORGLO <sup>®</sup>	X	X		500 IU/lb.	
HEALTHY GLO <sup>™</sup> Nuggets		X		1,000 IU/lb.	
HEALTHY GLO <sup>™</sup> Meal	X	X		1,000 IU/lb.	
Tindle <sup>®</sup> Trails	X	varies			
Various regional and custom feeds	X	X			

\* Prospanse appears on ADM ANI Equine feed tags as "Brewers Dried Yeast." It may have beneficial effects on animal microbial populations. Prospanse, a prebiotic, compared with other yeast products, has been found to exhibit superior ability to stimulate growth of fiber-digesting bacteria, resulting in better fiber digestibility of ration components and ultimately feed efficiency.

\*\* CitriStim\*, a prebiotic, is a whole-cell form of *Pichia guilliermondii* yeast harvested from the fermentative production of citric acid. It is a source of yeast mannans (aka MOS) and beta-glucans. It appears on feed tags as "Extracted Citric Acid Presscake."

\*\*\* PrimaLac\* is termed a direct fed microbial (DFM) or a multi-strain probiotic.

<http://www.primalac.com/specification.html>.

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<sup>€</sup>Trademark of ZinPro Corp.



ADM Alliance Nutrition has conducted numerous animal studies using Prospanse<sup>®</sup>, call (800) 680-8254. Important findings from a Technical Review Article by Piwanka<sup>1</sup> include:

1. Yeast product characteristics range from live cell concentrates to dilute yeast cultures including the media in which the yeast is grown. Most yeast sources available use the species *Saccharomyces cerevisiae*.
2. Many research studies on a variety of livestock, companion animals and horses have been conducted to determine the efficacy and mechanism of action of yeast.
3. In 1983, the first study evaluating yeast in equine rations was reported. Since then, yeast has become a common ingredient in horse rations.
4. Yeast appears to have an important role in the microbial digestion process. The most common finding in research studies with yeast shows an increase in the fiber-digesting bacteria population and fiber digestibility.
5. Yeast is a potential source of vitamins, including thiamine, and/or growth factors.
6. Yeast appears to improve feed palatability, to maintain a more consistent feed intake.
7. Broodmares in late gestation may have a reduced capacity to consume feed because of the large size of the fetus, additional tissue mass, and fluid volume of pregnancy. Pregnant mares fed yeast culture had greater digestibility of dietary dry matter (DM), acid detergent fiber (ADF) and neutral detergent fiber (NDF), protein, calcium, and phosphorus than those not supplemented with yeast culture (Glade, 1991a).
8. Feeding yeast in early lactation can improve early milk production of mares and increase foal growth (Glade, 1991b; Glade 1991d). Mares supplemented with yeast culture had foals with similar birth weights as those not supplemented with yeast culture (Glade, 1991b). Foals at 56 days of age, from mares supplemented with yeast, were 57 lb. heavier and 3.5 inches taller at the withers than foals from non-supplemented mares.
9. Glade and Pagan (1988) studied the effects of yeast on nursing foals beginning at ten weeks of age. Foals from yeast-supplemented mares had increased plasma lysine from day eight to day 36, higher concentrations of plasma glucose, triglycerides, and free amino acids at one, four, and eight weeks after birth (Glade, 1991c) and had greater body weight gains and wither heights than those from non-supplemented mares.
10. Ciro (1991) reported weanling horses fed yeast culture were five kg heavier and had a 10% faster growth rate than those not fed yeast culture over a six-month period.
11. Feeding yeast culture increased fiber digestion and nitrogen retention in yearling Thoroughbred horses (Glade and Biesik, 1986).
12. Fiber, calcium, and phosphorus digestibility, and nitrogen retention were improved in three-year-old horses fed 50-70% forage rations with yeast culture (Godbee, 1983).
13. Glade and Sist (1988) found an increase in DM, NDF, ADF, and nitrogen digestibility in exercised yearling horses fed yeast culture.
14. Feeding yeast to horses during exercise and training may help condition the horses (Campbell and Glade, 1989) by improving their aerobic metabolic capacity.
15. The digestive efficiency of geriatric (20 years of age or older) horses tends to be lower than young horses (Ralston et al., 1988).
16. Pagan (1990) reported that mature horses consuming yeast culture had increased phosphorus and fiber digestion compared with horses not fed yeast culture.