

Table 2. Description of some feed additives or supplements with animal performance claims and documented research in horses and associated costs.

Additive Type	Examples	Expected Actions	Research Support/Status	Daily Costs <sup>1</sup>
Antioxidants	Vitamin E & Selenium; vitamin C; Grape seed extract; lipoic acid	Minimize oxidative damage to reactive oxygen species generated during intense exercise or inflammatory conditions	A significant number (>50) of published controlled studies addressing various aspects of antioxidant effects. Study results have been mixed, but most suggested of some positive effect.	\$0.33-0.99
Antimicrobials	Antibiotics; anthelmintics	Provide therapy or prevention of specific pathogen associated diseases	Products are highly regulated by FDA and must be used accordingly.	\$0.63-0.85
Botanicals and Herbs	Wide range of whole plants or extracts	Insect control (garlic); calming effects; anti-inflammatory; metabolic effects	Other than some uncontrolled clinical reports in alternative therapy journals, there is little scientific documentation. Tremendous problems in active ingredient documentation and potential for toxicities. One study showed garlic intoxication.	variable
Enzymes	Phytase; Cellulase; Hemicellulase	Improve digestive capacity of specific compounds, nutrients within consumed diet	Small number of studies (<10). No improvement in P availability with phytase; Fiber digestibility not increased with fiber-based enzymes	NA
Ergogenic Agents	Carnitine; Chromium; Creatine; Betaine (TMG); Dimethyl-glycine (DMG)	Improve muscle mass and function. Increase muscle capacity for aerobic metabolism and facilitate recovery	A limited number of studies (10-20) have been published on various agents. Most have shown no effect of supplementation compared to controls.	\$0.56-1.36
Joint Supplements	Chondroitin sulfate, MSM; Glucosamine	Provide substrates for synthesis of structural components of joint cartilage	Limited number of clinical studies (<5) and most without control groups. All studies performed with one specific product which does not extrapolate to other products. Reviews of papers of research do not suggest efficacy with oral supplementation.	\$0.43-3.36

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Oligosaccharides	Fructooligosaccharides; mannooligosaccharides	Alter intestinal microbial populations by either stimulating growth of beneficial bacteria or inhibiting pathogens	Limited studies (3-5) published. Potential for use in foals, but needs further study.	\$0.43-1.39
Organic Minerals	Chelates; Proteinates; Complexes; Polysaccharides;	Improve bioavailability of mineral elements from the diet	Limited number of studies (<10). Studies varied in type of organic source versus inorganic source. Limited effects were seen with organic mineral supplementation and mostly with younger animals	\$0.26-1.22
Omega-3 Fatty Acids	EPA, DHA, Flaxseed, Fish oils	Anti-inflammatory properties, counter-regulatory metabolically to n-6 fatty acid derived eicosanoids compounds	Between 10 and 15 studies evaluated fatty acid sources in horses. All studies showed alteration in either plasma or membrane FA profile based on source. Most studies showed anti-inflammatory effects with n-3 fatty acids. Two limited clinical studies suggest reduced disease skin allergies with n-3 supplementation. Dose is not well defined.	\$0.46-0.90
Probiotics	Various lactic acid producing bacteria (live cultures);	Alter intestinal microbial populations by providing live beneficial bacteria that inhibit pathogen growth. Ims	About 10 studies published on probiotic use in horses. Mixed results reported: induced disease in foals; did and did not reduce Salmonella shedding in sick horses.	\$0.43-1.39
Yeast and Yeast extracts	Live or culture extracts Saccharomyces cerevisiea	Improve fiber digestibility and dietary nutrient availability; Alter intestinal microbial flora	Over 20 published studies addressing yeast supplementation in horses. Most studies showed some improvement in nutrient availability. Some studies have documented improved performance.	\$0.20-\$0.80

<sup>1</sup>Based on information posted on product comparisons for a retail manufacturer website (www.smartpackequine.com).