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## Direct Fed Microbials and Competitive Exclusion

*Dr. Jimmy L. Horner, Ph.D., P.A.S., Diplomate ACAN*

Protocol Naturals' Direct Fed Microbial products have been developed based on over 30 years of research with the concept of "competitive exclusion." The terms direct fed microbials, probiotics, and competitive exclusion cultures are considered synonymous by most and regardless of the term used, the objective of competitive exclusion is to displace or prevent the colonization of pathogenic bacteria in the host's intestine via "All-Natural" means.

Competitive exclusion was first proven as a viable feeding management practice in pig diets in Europe in 1973. Since 1973 the global market value of probiotics has grown into a multimillion dollar industry with an annual growth rate of more than 7%. The National Digestive Information Clearinghouse, Bethesda, MD, reports that over 70 million Americans' daily activities or work are adversely affected by a digestive disorder. The International Foundation for Functional Gastrointestinal Disorders, Milwaukee, WI, says one in four Americans are plagued daily by some functional gastrointestinal (GI) problem. In recent years, research into competitive exclusion products has increased, and people are becoming more interested. A 2001 congressional report stated: "Competitive exclusion products offer an innovative and valuable approach to reducing Salmonella and other harmful bacteria in recipients."

The specific strains of bacterial cultures in Protocol Naturals' Direct Fed Microbial products were selected for unique features such as adaptability, viability, antibiotic resistance and other biological characteristics specific to the intended host's digestive system. The multiple host-specific strain formula has a synergistic, broad spectrum activity that is extremely useful in replenishing or re-establishing desirable microflora in recipients.

It is also very important to note that the beneficial bacteria in Protocol Naturals' Direct Fed Microbial products are host-specific since the FDA defines competitive exclusion products as products containing live, viable microorganisms isolated from the gastrointestinal tract of the same species as the recipient animal. In other words, the bacteria used in competitive exclusion cultures can originate only from the animal or patient that they are intended to treat. Research in numerous species has demonstrated that host-specificity is required for intestinal attachment and maximum efficacy. The bacteria should also be in a form which renders them viable and active upon reaching the recipient's GI tract where the highest concentrations of pathogenic bacteria reside.

Protocol Naturals has addressed the intestinal availability of the beneficial bacteria in their products by utilizing a multi-layer microencapsulation process which prevents deactivation upon contact with moisture and also ensures bacterial viability and dissociation upon reaching the recipient's upper intestine.

Competitive exclusion therapy from the use of host-specific microorganisms such as those contained in Protocol Naturals' Direct Fed Microbials can be a very effective weapon against the arsenal of harmful bacteria which can adversely affect animal performance and longevity as well as human wellness. This technology also serves as an "All-Natural" and extremely viable alternative to the use of antibiotics in both commercial livestock production and human medicine.

### **Author**

Dr. Jimmy Horner holds a Ph.D. in Ruminant Nutrition from Texas A&M University and a M.S. in Animal Science from Oklahoma State University and has been consulting and teaching animal nutrition for more than 30 years. Dr. Horner is the President/CEO of Protocol Naturals/Protocol Technologies/Horner Industries, Bridgeport, Texas.