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ELECTRON microscopy of the same MOS source dried using two different processes demonstrates the effect alterations made during the drying process may have on the final product (Figure 4). Picture 4a shows a product of a smaller particle size with a well-defined shape. Picture 4b shows a material of a larger particle size that lacks definition.

Research conducted by INDEPESA and UMSNH (2008) addresses the effect particle size has on productivity of broilers supplemented with MOS of two different particle sizes. MOS products with a smaller particle size had a greater effect on final broiler bodyweight and dry matter intake (Table 2). Reducing the particle size of the larger MOS material by grinding did not cause the product to recover its functionality.

Other factors to take into consideration when identifying a MOS source for use in livestock diets include solubility, primary structure, molecular weight, type and degree of branching of glucan structures and polymer charge (Bohn, et al., 1995).

Many MOS sources are available, but product inconsistency (Table 3) may contribute to the variability in livestock performance response often seen in controlled trials and field evaluations. Selecting a MOS product should be based on knowledge of the specific strain of S. cerevisiae used and consistency of the manufacturing processes specific to each source of MOS and knowledge of the basic characteristics associated with mannan and beta-glucan content and structure.

While much of the early human research focused on the role specific purifi ed beta-glucan sources play in the innate immune system, the case can now be made that optimal application of yeast cell wall derivatives in animal nutrition involves multiple factors.

Not only is the beta-glucan eff ect on the immune system a key factor, but so is the ability of the manno­proteins to selectively bind to type I fimbria on certain isolates of specific strains of enterobacteria as well as the role manno­proteins play in triggering antibody production.

Additional characteristics of MOS sources such as solubility, primary structure, molecular weight, type and degree of branching of glucan structures and polymer charge are all critical to defining the role any particular source of yeast cell wall derivative or MOS may have in supporting an animal’s response to pathogens.

Ultimately, suppliers of yeast cell wall derivatives should be able to provide information relative to these key characteristics to assure the greatest likelihood of generating the most positive eff ect on overall animal health and performance.

References

Avila, Lopez and Arce, INDEPESA and UMSNH, Mexico, 2008.