**THE EFFECT OF PHYSICOCHEMICAL PROPERTIES OF FEED GRADE ZINC OXIDE SOURCES IN DISSOLUTION KINETICS**

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The bioavailability of a trace mineral source is related to its in vivo solubility kinetics, which in turn is determined by its physicochemical properties. It is still not clear which characteristics are more relevant in affecting solubility and bioavailability of feed compounds. Zinc Oxide (ZnO), a common feed additive used to supplement zinc in poultry diets, have shown different responses in animal bioavailability. This project aims to characterize different feed grade ZnO to better clarify their dissolution kinetics that cause significant differences in bioavailability. Over 30 samples of ZnO have been collected from the feed industry worldwide. 5 representative samples were analyzed for particle size, shape, specific area and porosity of powder. Dissolution kinetics was assessed in vitro from a pH range of 2 to 4 in water with an automatic burette and zinc concentration measured with ICP-OES. The different physicochemical characteristics of zinc oxide sources affected their kinetics behavior which can lead to variable bioavailability. A multifactorial analysis was developed to correlate which characteristic are more relevant affecting the dissolution kinetics of ZnO.

Key words: Zinc oxide, characterization, bioavailability, solubility kinetics