

Supplementary data

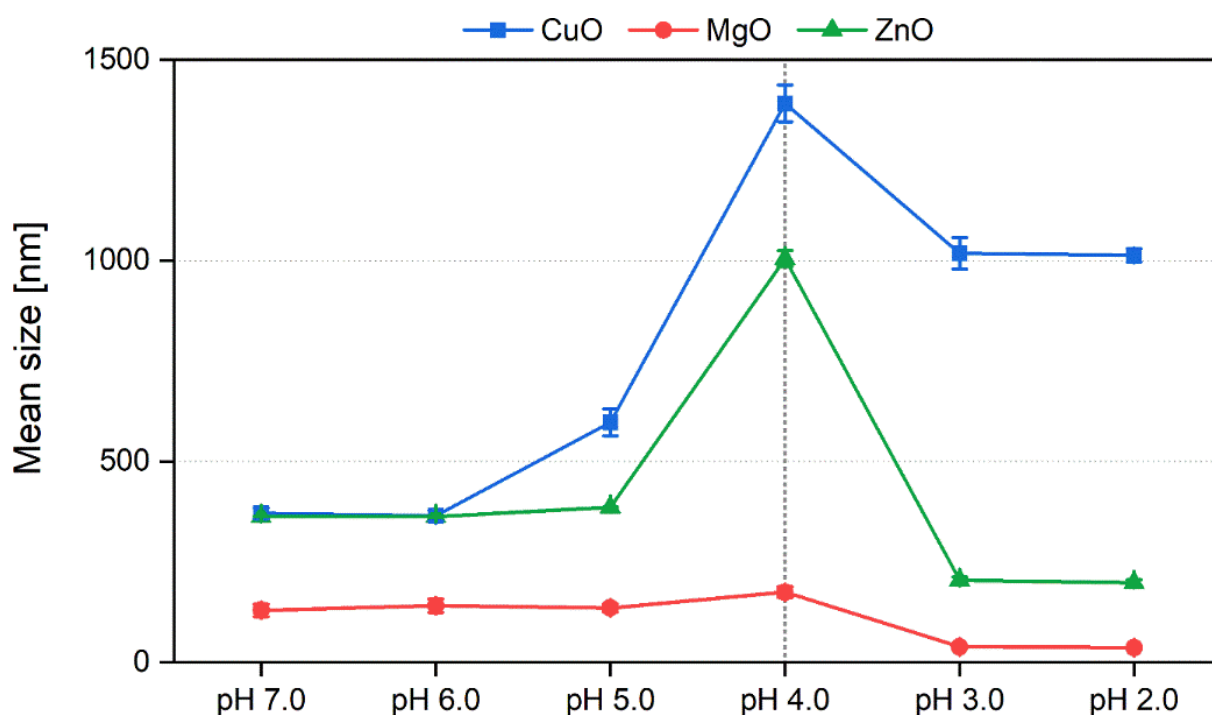


Figure S1: Impact of decreasing pH values on the mean particle size of copper oxide (CuO), magnesium oxide (MgO), and zinc oxide (ZnO) particle dispersions. Hydrogen chloride (10%) was added dropwise to decrease the pH value from 7.0 down to 2.0 in order to simulate possible changes in particle size distribution, which might occur during the digestion passage from mouth (neutral pH) to stomach (pH 2.0). The isoelectric point at pH 4.0 is marked as grey dotted line, where particle agglomeration is increasing due to the loss of stabilizing proteins on their surface. The data shown are expressed as means \pm SD and were measured in triplicates of three independent replicates.

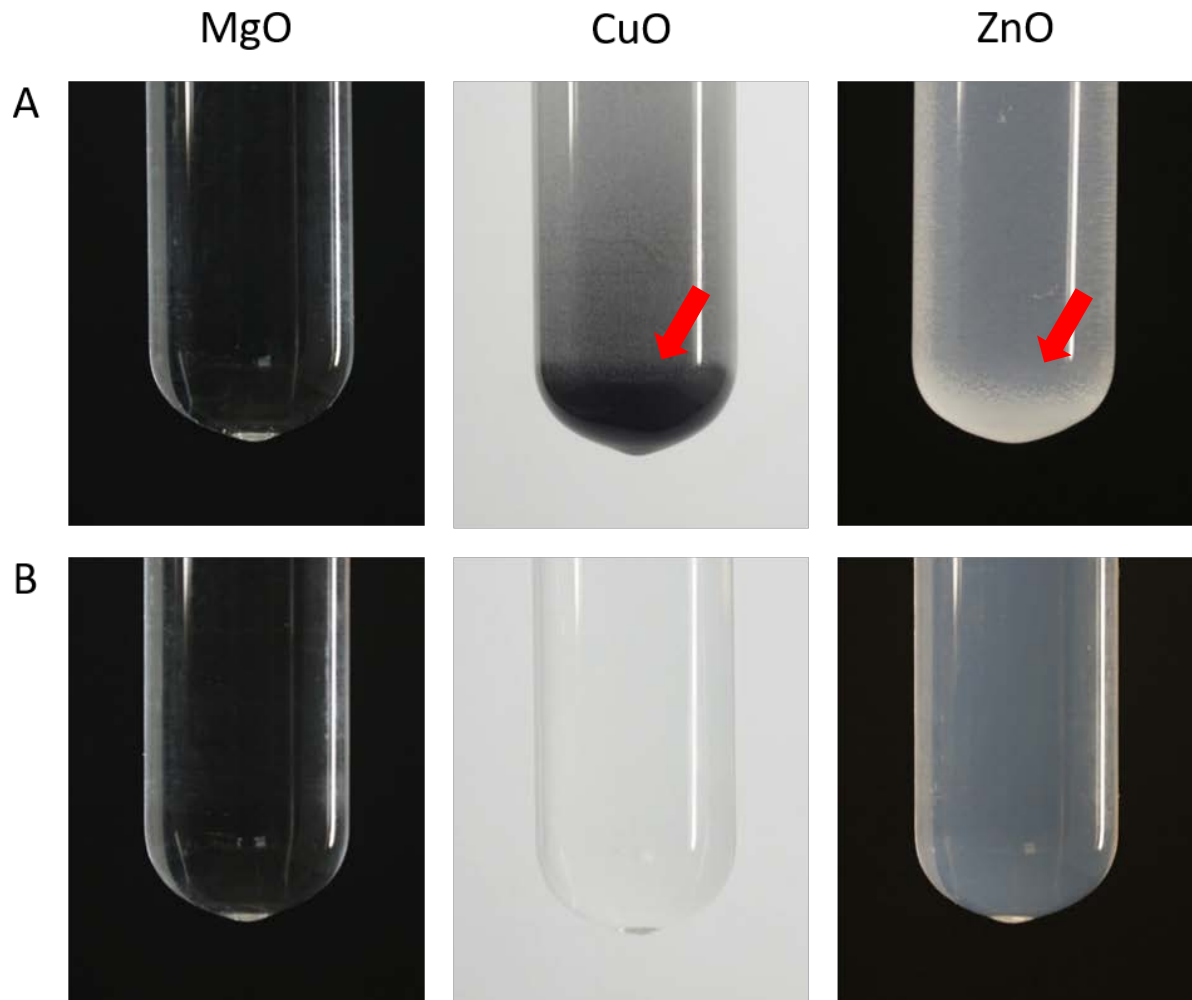


Figure S2: Images of the precipitated materials after simulated digestion in a simplified approach (only transit time, temperature, and pH value were considered). A: No precipitated material could be found for magnesium oxide (MgO), while precipitates (red arrow) were clearly visible for copper oxide (CuO) and zinc oxide (ZnO). B: After removing the precipitates by centrifugation (2 x 20 min; 3,000 x g), clear solutions were visible for MgO and CuO. For ZnO, a slightly cloudy coloration could be seen, indicating the presence of particle material (see also Fig. 3 main text).