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Similarly, higher levels of manganese than established to prevent deficiency may modulate physiological function. The NRC (1994) recommendation for manganese in broiler diets as 60 ppm, but recent research suggests that a higher level (120-130 ppm) may be needed (Li et al., 2010). There is a need to study high-concentration manganese-super oxide dismutase messenger RNA levels (Li et al., 2011) and to conduct acute (Shen et al., 2011) and chronic responses (Gajula et al., 2011).

Reduction in the levels of minerals with hydroxy or high-quality chelated minerals would likely have positive effects. For example, a chelated trace mineral mix consisting of copper, zinc, manganese and selenium improved leg health in turkey toms throughout growthout (Ferket et al., 2009). All of these examples indicate that the more optimal bond strength of hydroxy and high-quality chelated minerals is the key to their improved bioavailability, and the longer time they are being absorbed through a longer length of the intestines (and, thus, allowing a higher dietary concentration) in more area of the gastrointestinal tract to allow for mineral absorption and immune function of growing animals.

Recent research in mineral absorption and regulation of transport has broadened the understanding of the mechanisms regulating mineral absorption. Recent research in porcine has suggested that increased mineral requirements of broiler chicks may be warranted, which may be due to the modified dietary intake and mineral ion requirements (e.g., use of purified diets) and the high rate of growth needs of new genetic strains of birds. New technologies in mineral protein complexation and regulation of transport has broadened the understanding of the mechanisms regulating mineral absorption. Recent research in porcine has suggested that increased mineral requirements of broiler chicks may be warranted, which may be due to the modified dietary intake and mineral ion requirements (e.g., use of purified diets) and the high rate of growth needs of new genetic strains of birds.

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