Reducing the Risk of Developmental Orthopaedic Disease: Focus on copper

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The role of copper in developmental orthopaedic disease (DOD) has received a great deal of attention in recent years. There is no doubt that feeding a diet containing low levels of copper can result in skeletal abnormalities in foals. Following copper supplementation, studies describe reductions in the development of osteochondritis dissecans (OCD), subchondral bone cysts and angular and flexure deformities. These studies do not however address the issue of the provision of nutrients for the pre-weaned foal. The milk from lactating mares contains low levels of these nutrients and research has shown that adding more to the lactating mare's diet does not increase the trace mineral content of the milk. Therefore, trace mineral supplementation of the late pregnant mare is also vitally important, as the foetus stores nutrients such as copper for use during the first few months after it is born. New Zealand researchers have shown that copper supplementation of mares was associated with a significant reduction in the physitis scores of the foals at 150 days of age. In this study, there was a significantly lower incidence of articular cartilage lesions in foals from copper supplemented mares. The introduction of a correctly formulated creep feed can also assist in providing these key nutrients prior to weaning.

The National Research Council (1989) recommends that all horses receive 10 ppm copper in the diet. Some research indicates that growing horses consuming these levels (or lower) are more likely to develop DOD. Despite other studies suggesting that lower amounts of dietary copper may be adequate, because horses will tolerate reasonably high levels of copper, several publications are now recommending increased levels of copper be added to growing foal and broodmare rations. The majority of commercial feeds available provide levels of copper in line with the original National Research Council recommendations of 10 ppm and most of the commonly used grains, protein meals, hays, chaffs and pastures in Australia are relatively low in copper. In these circumstances, supplementation may be beneficial.

It is well known that DOD is a multifactorial condition. Other nutritional factors of importance include inappropriate energy, protein, calcium, phosphorus and zinc levels while other causes include exercise and biomechanical trauma, body size and growth, hormones and genetics. While copper supplementation is not likely to abolish DOD in growing foals, it may be one strategy to assist in reducing the incidence or severity of the condition.