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**Aspects of Growth and
Development of the
Pasture-fed Thoroughbred
Foal in
New Zealand**

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Abstract

In each of 2 years, pregnant mares ($n = 10$ and $n = 23$) kept at pasture were divided into copper supplemented or unsupplemented groups, and injected with calcium copper edetate or saline. Their foals were examined, weighed, measured and clinically scored at 2 weekly intervals from birth to 160 days of age to assess growth and development, and evidence of developmental orthopaedic disease (DOD). Foal liver biopsies were harvested by Tru-cut biopsy needle at different ages for determination of copper concentration. At 160 days of age, articular surfaces were examined for cartilage irregularities, which were sampled for histology and histochemistry. Cartilage samples were harvested from irregularities and defined sites for histology. Distal third metacarpal and metatarsal bones (Mc3 and Mt3) were sawn frontally, radiographed and processed for histology.

The parenteral copper supplementation had no effect on mare or foal liver copper concentration, and was not associated with reduced evidence of DOD in foals. The prevalence and severity of DOD lesions was very low. Two different patterns of decline in foal liver copper concentration were observed. Enlargements of the distal Mc3 and Mt3 physeal region were present in all foals, but were not associated with pain, lameness, or abnormalities in the metaphyseal growth plate.

In vivo techniques to assess body composition could be used to predict chemical body composition, particularly ultrasonographic rump fat thickness measurements. Fillies were significantly fatter than colts at 160 days of age, despite no differences in mean birth weight and weight gain. The only growth parameters associated with the prevalence of DOD lesions was rapid growth rate between 5 and 6 months of age, which was associated with more lesions in the tibiotarsal joint.

The New Zealand Thoroughbred industry should weigh and condition score foals at monthly intervals, keeping careful records. Foals can be successfully

raised at pasture, with good growth, and a low incidence of DOD lesions at 160 days of age, without being excessively fat. Copper injections should not be given to horses, but oral supplementation with copper should be considered for pregnant mares in late gestation.

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