

## **Introduction**

The horse evolved as a grazing and browsing, hind-gut fermenting herbivore. Through domestication over the last five thousand years, the life of the horse has adapted to the life of humans. Fencing has limited accessibility to a variety of foods, and continued use of the land with the development of improved pastures has further reduced variety. The quality of pasture changes with the season. Now it is questionable whether today's grass-legume pastures provide optimal nutrition for reproduction and growth of horses. In the last three hundred years, humans have introduced meals of starchy cereal grains into the horse diet. This practice has been a source of problems for the horse, causing circulatory, metabolic and endocrine perturbations, thus increasing the risk of colic, laminitis and founder, so called "hot" behavior, exertional rhabdomyolysis, and developmental orthopedic disease.

The objective of these studies was to design an optimal nutritional supplement for reproduction and growth of horses maintained on grass-legume pastures. Specific objectives were to determine the need for supplementation of nutrients and fibers by examining seasonal changes in pasture and to assess the nutritional status of mares, foals and weanlings fed different diets using growth measurements, radiographic bone evaluations, milk composition and glucose response tests.