

CARBOHYDRATE AND FAT SUPPLEMENTATION IN GRAZING MARES AND FOALS

by

Rhonda Michelle Hoffman

D. S. Kronfeld, Chair
Animal and Poultry Sciences

June 30, 1997

ABSTRACT

The objective of these studies was to design an optimal nutritional supplement suitable for grazing horses using fat and fiber to replace the grain and molasses in the traditional sweet feed. Thoroughbred mares and foals grazing bluegrass/clover pastures were used in these studies, twenty mares and their foals in 1994 to 1995, and twenty mares and foals in 1995 to 1996. Seasonal variation in pasture was examined, and the need for supplementation of nutrients and fibers was assessed. The nutritional status of grazing mares, foals, weanlings and yearlings, fed either a starch and sugar supplement (SS) or a fat and fiber supplement (FF), was examined using growth measurements, radiographic bone evaluations, milk composition and glucose tolerance tests. These studies suggest that fiber may be an important component of an ideal supplement for improved grass/legume pastures. Seasonal variation in pasture indicated an increase in hydrolyzable and rapidly fermented carbohydrates during periods of rapid growth. The FF supplement may have buffered seasonal changes and the

increased hydrolyzable carbohydrate content in rapidly growing pasture, as evidenced by smoother growth curves in the yearlings. Young horses, after weaning until the following May, had lower estimated bone mineral content when fed the FF supplement. The lower bone mineral content in the FF supplemented horses may have been due to decreased absorption of calcium or metabolic and hormonal changes associated with adaptation to the different energy sources in the supplements. Milk composition of FF supplemented mares was influenced in ways likely to improve foal health. The FF supplemented mares had enhanced linoleic acid content, which may reduce the risk of gastric ulcers in foals, and increased immunoglobulin G concentration, which may enhance passive immunity. The carbohydrate status of mares, as assessed by glucose tolerance tests, indicated a slower glucose clearance that could be a metabolic adaptation of the mares to the SS and FF supplements.