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GROWING UP IN THE *Bluegrass*

Central Kentucky is unquestionably the mecca of Thoroughbred breeding. The majority of the world's elite racing stallions are retired to famed studs in the area. Where there are prominent stallions, there are plenty of mares and resultant offspring. Kentucky therefore provides a near-perfect venue in which to conduct studies on mare-foal pairs because of the sheer numbers available.

Thoroughbred foals are born primarily in winter and early spring. By late May and early June, thousands of mares and foals dot the landscape, all devouring grass grown on the celebrated limestone-laden fields. The foals typically remain with their dams for four or five months before being weaned in late summer or early fall.

In the name of science, owners and handlers of these horses often accommodate researchers, allowing them to collect data on different aspects of growth. Kentucky Equine Research (KER) has been the beneficiary of this kindness over the past decade.

Recently, a number of Thoroughbred mares and their foals, all born in central Kentucky, were studied to assess the influence of month of birth, season, and gender on body weight, condition score, and daily weight gain. Foals grow rapidly following birth, often quadrupling their body weight by five months of age. During this time, foals derive the nutrients necessary to support accelerated growth from a combination of mare milk, pasture, and supplemental grain. Pasture changes markedly between winter and spring, so the availability of nutrients to both the lactating mare and her foal changes considerably depending on the month in which the foal was born.

Earlier Work Sets a Precedent

As is often the case, earlier work in the same field often sets modern researchers on a path of study. In the late 1970s, noted equine nutritionist Harold Hintz studied birth weights of Canadian Thoroughbred foals. He found that those born in January, February, and March were smaller than those born in April and May, and weight differences among foals persisted as they matured.

In a study performed 10 years ago by KER, foals born in the first three months of the year were smaller than those born in April and May, confirming Hintz's observations. However, in this early KER study, differences in weight had evened out by the time the foals were six months old.

Research performed last year in the United Kingdom showed that foals born in January were smaller than those born in March or April, but birth month did not affect growth rate in the first seven months of life.

Therefore, it appears that the location as well as the

season of year affects how suckling foals grow. None of these studies evaluated the effect of season on changes in body weight and condition in lactating mares. KER investigated how body weight and body condition of a large number of Kentucky Thoroughbred mares and their foals were affected by month of foaling, season, and gender.

The Mechanics of the Study

The total number of mares-and-foal pairs used in this study was 3909. Of the foals, 1958 were fillies and 1951 were colts. The foals were sired by approximately 480 different stallions and were raised on 50 commercial and private farms. The number of foals born in each month follows: January (354; 9%), February (998; 25.5%), March (1073; 27.5%), April (977; 25%), and May (507; 13%).

Scientists at KER weighed the mares and their current-year foals over a ten-year period using a portable electronic scale. Body condition score (BCS) was measured in mares and foals using a scoring system of 1 through 9 to estimate fat deposition. A score of 1 denotes extreme emaciation, whereas a score of 9 signifies extreme obesity. The wither height of foals was also measured. Finally, average daily gain (ADG) was calculated for each horse. Data were collected on foals until weaning occurred.

The Results Are In

Foals. (1) Colts were between 1.7 and 3 kilograms (3.75 and 6.61 pounds) heavier and 0.6 and 1.3 centimeters (0.2 and 0.5 inches) taller than fillies throughout the study. (2) Colts and fillies exhibited similar BCS from birth to seven days of age. At one month of age, though, fillies were fatter than colts and remained so until the end of the study. (3) Foals born in January, February, and March had lower body weights than foals born in April and May. Foals born in January and February remained lighter than foals born in March, April, or May until three months of age, and January foals remained lighter than all other foals until four months of age. By 150 days of age, there were no differences in body weight between birth months. (4) January and February foals had lower ADG than March, April, and May foals at 7 days and one month of age. January foals had greater ADG than all other foals at three months of age, coinciding with the rapid growth of spring pasture. May foals had the lowest ADG of all foals at two, three, and four months of age, coinciding with July, August, and September when late summer pasture is losing its quality. (5) As expected, BCS was lowest at 7 days and increased between 7 and 30 days. January and February foals had significantly greater BCS than March, April, and May foals at three months of age.

Mares. (1) Mares that foaled in early winter (January and February) had lower body weights in the first two months after foaling than mares that foaled in March, April, or May. By the fourth or fifth month of lactation, there was no difference in body weight between the mares. (2) Mares that foaled in January and February showed weight loss in the first month after foaling. January-foaling mares then gained the most weight during the fourth and fifth month of lactation. (3) Body weight, daily weight change, and BCS increased in March and continued through June, regardless of stage of lactation.

Changes in mare body weight and BCS appeared to be related to seasonal and management factors. Winter-foaling mares that showed decreased body weight, negative daily weight gain, and lower BCS after foaling are likely to spend more time indoors with restricted access to pasture until the spring flush of grass.

Data from this study demonstrate definitively that season of the year affects growth in suckling foals. Those born in January and February were smaller at birth and grew more slowly during the first two months of life than foals born later in the year.

Mares that foaled in January and February often lost weight during early lactation, suggesting their caloric intakes did not meet their energy requirements. Later in lactation when there was access to lush pasture, these early-foaling mares gained more weight and supported faster growth rates in their foals than late-foaling mares. It remains unclear, however, whether the accelerated weight gain of foals was due to increased milk production, increased pasture consumption by the foals, or a combination of both factors.

Want to know more?

This and other original research conducted by KER was presented at the 15th Annual Equine Nutrition Conference for Feed Manufacturers, held October 16 and 17 in Lexington, KY. Several prominent researchers discussed a range of pertinent topics during the conference. If you'd like to order a copy of the proceedings, a spiral-bound booklet that features full-length papers presented at the conference, please contact KER at 1-888-873-1988 or info@ker.com.

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