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THE EFFECT OF WEANING AGE ON FOAL GROWTH AND BONE DENSITY

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Weaning can be one of the most stressful events in a foal's life, often resulting in a decreased growth rate, increased susceptibility to infectious disease and an increased risk of self-induced injury. Foals may take several weeks to resume their rapid growth following weaning, which may lead to a competitive disadvantage in foals intended for show or sale in late summer and early fall. More importantly, loss of the mare's milk may reduce the nutrients available for bone formation during the postweaning period. The purpose of this study was to assess the effect of weaning and weaning age on foal growth and bone density. Weaning ages of 4.5 and 6.0 months were chosen because they represented ages commonly used in the industry. Foals weaned at 6.0 months should be relying less on the dam's milk and more on solid feed for their nutrients at the time of weaning. Therefore, we hypothesized that the growth and bone density of foals weaned at 6.0 months should be affected less by weaning compared to foals weaned at 4.5 months.

Seven foals (4 Quarter Horses (QH), 3 Thoroughbreds (TB)) were weaned at 140 days of age (4.5 months) and 8 foals (4 QH, 4 TB) were weaned at 182 days of age (6.0 months). Foals were weaned under identical management conditions, beginning in late June and continuing through mid-October. Body weight (BW), withers height (WH) and cannon circumference (CC) measurements were obtained from each foal at 3 week intervals before and after weaning. Measurements were collected from 119 days of age through 224 days of age in foals weaned at 4.5 months and through 266 days of age in foals weaned at 6.0 months. Additional BW measurements were obtained from all foals at 1 week postweaning. Dorsopalmar radiographs of the right and left third metacarpals (MCIII) were also obtained at 3 week intervals for the determination of radiographic bone density.

Foals gained 0.83±0.06 kg/d during the 3 week interval prior to weaning. Average daily gain (ADG) decreased ($P<0.01$) to 0.13±0.17 kg in the first week postweaning and remained lower than the preweaning ADG ($P<0.01$) through 3 week postweaning (0.57±0.07 kg). The decline between pre- and postweaning ADG was similar between foals weaned at 4.5 months and foals weaned at 6.0 months, indicating a similar reduction in ADG in response to weaning. When compared at the same age intervals, BW was similar between weaning groups (Figure 1). The gain in WH was similar

before and after weaning (P>0.05); thus, weaning did not appear to affect the rate of growth at the withers. Furthermore, no differences in WH were observed between foals weaned at 4.5 months and foals weaned at 6.0 months when compared at similar ages. Therefore, weaning age did not appear to affect WH growth. The postweaning gain in CC was less than the preweaning gain in foals weaned at 4.5 months (P<0.05), but not in foals weaned at 6.0 months. As a result, foals weaned at 4.5 months had smaller CC at 161 days (P<0.05) and 182 days (P<0.10) than foals weaned at 6.0 months (Figure 2). Thus, it appears that weaning may result in growth depression of CC in younger foals. The densities of the medial, medullary and lateral areas of the right and left MCIII continued to increase after weaning (P<0.05), indicating that weaning did not affect bone density. Medial bone density was greater at 140 days of age (P<0.05) in foals weaned at 6.0 months than in foals weaned at 4.5 months; however, there were no differences in medial density between weaning groups at any age beyond 140 days (Table 1). No differences were observed in medullary bone density between weaning groups (Table 1). However, lateral bone density was greater at 140 days and 161 days of age in foals weaned at 6.0 months (P<0.05) compared to foals weaned at 4.5 months (Table 1). Because differences in bone density were noted before any of the foals had been weaned (i.e., the differences observed at 140 days of age), it is difficult to determine if weaning age influenced changes in bone density in response to weaning. In conclusion, weaning at 6.0 months of age may provide little growth advantage over weaning at 4.5 months of age.

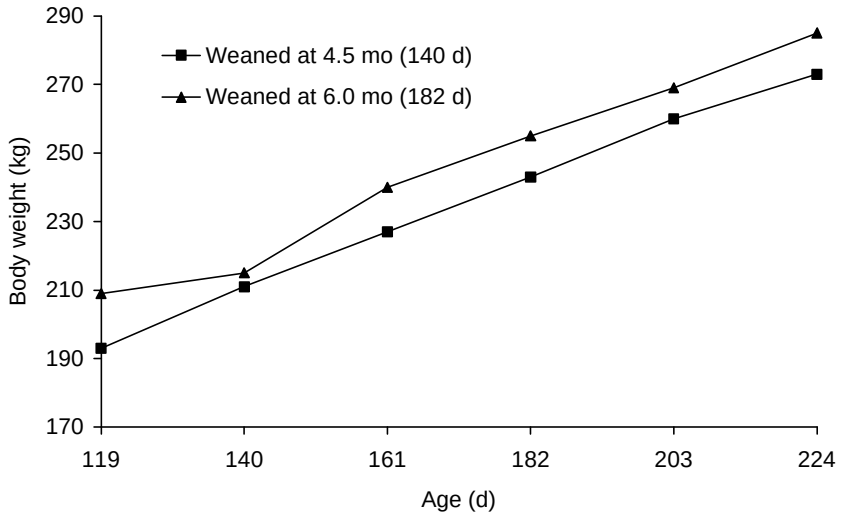

Figure 1. Comparison of body weight between foals weaned at 4.5 months and foals weaned at 6.0 months of age.

TABLE 1. COMPARISON OF MEDIAL, MEDULLARY AND LATERAL RADIOGRAPHIC BONE DENSITY (MM AL) (±SE) BETWEEN FOALS WEANED AT 4.5 MONTHS (140 DAYS) AND FOALS WEANED AT 6.0 MONTHS (182 DAYS) OF AGE[a].

	Medial		*Medullary*		*Lateral*	
Age (d)	*4.5*	*6.0*	*4.5*	*6.0*	*4.5*	*6.0*
119	18.9±0.4	19.0±0.5	14.7±0.3	14.7±0.5	18.8±0.5	17.9±0.6
140	20.1±0.2[a]	21.2±0.5[b]	15.1±0.3	15.2±0.4	18.9±0.5[b]	0.0±0.6[c]
161	**21.5±0.4**	22.0±0.6	**16.4±0.4**	16.4±0.5	**20.0±0.5**[b]	**1.5±0.5**[c]
182	**21.8±0.3**	21.8±0.6	**17.1±0.3**	16.5±0.4	**20.2±0.3**	**20.3±0.5**
203	**23.0±0.4**	**22.5±0.4**	**17.7±0.4**	**16.8±0.4**	**21.1±0.6**	**21.0±0.5**
224	**23.5±0.4**	**23.5±0.4**	**18.1±0.4**	**18.2±0.3**	**21.3±0.5**	**22.2±0.4**

[a] Variables highlighted in bold type are those observed postweaning.
[b,c] Means of the same variable in the same row with different superscripts differ P<0.05).

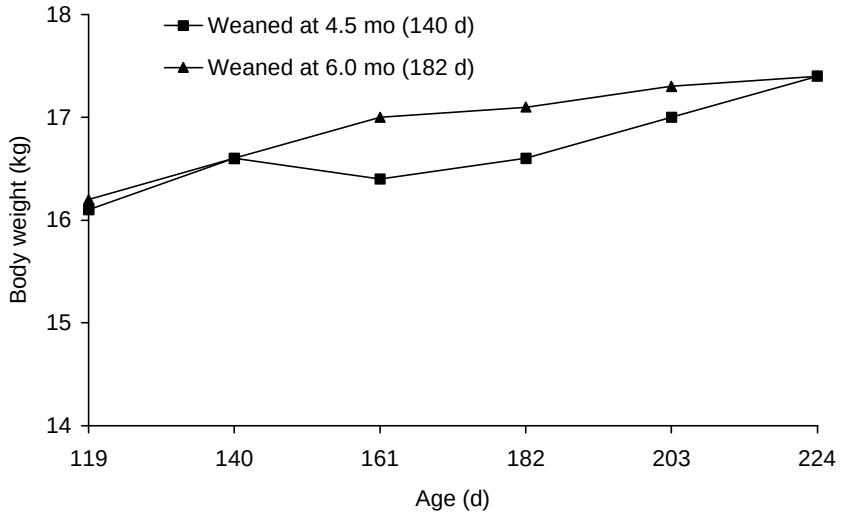

Figure 2. Comparison of cannon circumference of the left MCIII between foals weaned at 4.5 months and foals weaned at 6.0 months.


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