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Growth In Horses

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Do you remember your Grandmother marking your height on the frame of her kitchen door? When someone has a baby, in addition to its name and sex, the common question is, “What did it weigh?” These examples point to the fact that we are interested in the growth of our children.

In the same way, horse owners should focus on the growth of young horses, as it is also very important. It influences their nutrient requirements, how they are fed and managed, and can ultimately impact performance.

Growth can be over-emphasized. Some horse owners think that “bigger is better,” which is not true for all young horses. In other situations, it is neglected, and young horses do not grow properly or have growth problems.

Growth. Skeletal growth is the primary growth parameter in young horses. Growth is normally evaluated as height, length, heart-girth circumference and sometimes hip height. Height is measured in hands at the wither, and length in inches is measured from the point of the shoulder to the point of the buttock. Heart girth is the distance around the horse’s barrel at the heart girth. Heart girth is more likely to be influenced by body condition (fat), which does not materially influence height or length. Since skeletal development and soundness are so important in horses, length of the front and rear cannons are also often measured, especially in research studies.

Weight is correlated to growth. As a young horse grows taller and longer with age, it will also weigh more. However, weight per se should not be the single focus of growth. Weight change does not occur as rapidly as skeletal growth. Excessive weight in young, growing horses can be detrimental.

Foal Birth Weight and Mare Nutrition. Normally, foals weigh 8 – 10 percent of their dam’s body weight at

birth. Thus, a 1,200-pound mare will have a foal weighing 100 – 125 pounds at birth.

How mares are fed in late pregnancy and during early lactation affects foal growth. Research indicates that the most rapid growth may occur in the fetus during late pregnancy.

Mares fed 120 percent of the National Research Council (NRC) energy requirement had foals with an average daily gain of 2.77 pounds vs. 1.94 pounds for foals out of mares fed 100 percent of the NRC energy levels. This was confirmed in another study where foals from mares fed a high energy ration were 19 pounds heavier at 30 days of age and 26 pounds heavier at 60 days of age than foals out of mares fed a low energy ration.

The level of protein fed to mares also influences foal growth. Foals out of mares fed a 15 percent protein ration gained 2.07 pounds per day while those out of mares fed 10 percent protein gained only 1.87 pounds daily.

General Growth. Table I shows that growth in height occurs early and is quite rapid. Ponies grow faster than light horses while draft horses grow slower. This physiological process is observed in other animals with larger animals (e.g., elephants) growing slow and small animals (e.g., mice) growing rapidly.

Table II indicates that weight gain is not as rapid as skeletal growth. Bone and muscle deposition occurs before body fat. Horses do not tend to deposit much body fat until their skeleton growth is complete. Yearlings, even those at sales, tend to have body condition scores of 5.8 – 5.9.

These growth data emphasize the critical nature of the first 18 months of a horse’s life. Proper nutrition is obviously vital if the young horse is to grow normally. The combination of early rapid growth and the efficiency data (Table III) emphasizes the importance of nutrition during this time period. Creep feeding is a management consideration that allows the owner to take advantage of these two processes.

Efficiency of Growth. In animal species, average daily gain (ADG) is the standard measure of growth.

Efficiency of gain expressed as pounds of feed per pound of gain is a common parameter for cattle, swine and sheep, but it is not used often in horses.

Foals grow rapidly as noted in Table IV. As foals become older, ADG declines, because more of the nutrients are required to maintain their larger body size. In other words, less nutrients are available to build growth tissues. It takes more energy, protein, minerals and vitamins to maintain a 400-pound weanling than a 300-pound one even though the 400-pound weanling will eat more feed.

Efficiency data listed in Table III show the dramatic decline in efficiency as foals become older and heavier. This physiological process is also observed in other farm animals.

One of the key points of these growth data is that early growth is both rapid and efficient, thus, more cost effective. Efficiency does have relevance for how the owner will feed young, growing horses for their intended purposes. Breeders with several foals, or owners with a foal that they want to grow rapidly, can take advantage of this early, cost-effective growth.

Maximum or Optimal Growth. In recent years with better knowledge of nutrition and health care, it has not been unusual to see yearlings that look like two-year-olds. One must question, Is this good? Should owners of young, growing horses strive for maximum or optimal growth?

Horses can grow too fast, becoming too heavy for their age. Some negative issues occur from too rapid growth. Feet and leg problems in young horses are commonly observed in animals "pushed" to gain or grow more rapidly than normal. It is important to understand that a horse will never grow taller or longer than its genetic potential. However, it is possible to have a horse gain weight more quickly at a young age than is normally advisable.

Owners of young, growing horses should strive for optimal growth rather than maximum growth. It is a safer process, which will result in fewer feet and leg issues as well as other potential problems such as possible colic and founder.

When Do Horses Mature? At what age do horses stop growing? Several factors, such as genetics, nutrition, management and environment, contribute to this answer. Horses fed and managed normally will usually grow very little in height after they are two years old, having reached 90 percent of their growth by 18 months. Part of this could be due to selection for early maturing horses. Some breeds, such as Warmbloods and draft horses, mature slower than others. And, other breeds, such as ponies, will mature faster.

The front and hind cannon bone lengths are the first parameter to mature in the horse's body, emphasizing the rapid and significant skeletal growth.

Data from 700 Thoroughbred foals from birth to 18 months of age, collected over a three year period, indicate that growth rate is more a function of the season of the year than age or when a foal is born. Regardless of when foals were born, growth declined in their first winter and accelerated in April and May of their yearling year, which coincided with spring pasture.

Nutrition and proper management also influence the rate of growth. Feral horses living out West on native

range tend to mature at a later age because of the lower quality of forage available.

Creep Feeding. Because of this early, rapid, efficient growth, creep feeding can enhance development when managed correctly. Owners that show or sell young horses or train them for performance as two-year-olds likely find creep feeding sucklings advantageous.

Another major reason to creep feed, especially if pastures are of low or poor quality or mares are poor milkers, is after 60- to 90-days of lactation, mares do not produce enough milk to meet the nutritional needs of sucklings. This does not indicate that these foals will be "stunted;" they will just grow slower than their genetic potential. It will also take longer and cost more for them to put on the growth they would have made fed a creep feed.

Some individuals think that creep-fed foals will be too fat, resulting in problems such as Developmental Orthopedic Disease. However, this is not likely to occur if properly balanced creep feeds are fed and managed as noted. Foals so fed have not experienced any additional feet and leg issues.

Horse owners should feed only one pound of feed daily for each month of a foal's age. Thus, a three-month-old foal should be fed three pounds of creep feed per day.

Creep feed should be put out fresh daily. With several foals, it is advisable to put out fresh creep feed twice or three times a day if possible. Remove any uneaten feed the next morning when putting out fresh feed. It is better to feed foals in rubber buckets, using one more bucket than the number of foals, as there will be less competition and physical contact than if they are fed in a trough. If size and age differ among foals in a herd, it is best to separate mares with older, larger foals from mares with younger and smaller ones. Aggressive foals and their dams should be placed in another pasture. These management steps will prevent some foals from eating more creep feed than desired while encouraging timid ones to consume adequate creep feed.

It appears that starting creep feeding by four weeks of age may produce better results than delaying creep feeding. In any case, foals should be eating grain before being weaned. Weaning is a stressful situation. If foals have to learn to eat grain after being weaned, they will be more stressed, with a greater decline in average daily gain.

Weaning will normally reduce weight gain for up to three weeks after weaning. In one study, ADG was 1.83 pounds three weeks before weaning then declined to 0.29 pounds the first week after weaning. ADG remained low (1.27) through three-weeks post-weaning. While weaning depressed average daily gain, it did not appear to affect wither height, growth or bone density. Other data have also shown that stresses such as weaning and poor nutrition do not affect skeletal growth, unless the level of nutrition is extremely low or unbalanced.

Rapid Growth, Not Fat. More horse owners and trainers are realizing that fat yearlings and two-year-olds are not efficient. There are two major problems: 1) fat young horses are more likely to have problems and 2) most of the excessive body fat must be removed before two-year-olds can be properly trained and perform. This

can be a time consuming and expensive procedure. Opposing this viewpoint, some owners mistakenly think that fat horses are healthy horses.

Declining interest in halter horses and more emphasis on performance horses has also helped shift the criteria to natural growth rather than just being fat. One example of this is a study of Thoroughbred sale yearlings showing that larger (taller and heavier) animals sold for more than the median price in their sale session. Higher body condition scores (fatter horses) did not influence sale prices. In other words, buyers wanted larger, but not fatter, yearlings.

In a growth study, fillies from 14-days of age to 18-months were observed to be fatter than colts at all but three ages. BCS increased for the first 3 months of age in colts and 4 months in fillies, then declined by about one BCS unit until both were about a year old. This decline in BCS appears to correlate with the time when the broodmare's milk production is least adequate to provide the foal's nutritional needs. BCS remained low during the fall and winter but increased in the spring of the yearling year, which coincides with spring pasture.

Developmental Orthopedic Disease (DOD). DOD is a term used to describe a number of skeletal diseases in growing horses, including epiphysitis, osteochondrosis, osteochondritis dissecans, wobblers syndrome and angular limb deformities. Occurrence of DOD is critical from 3 to 9 months of age.

Nutrition is often touted as a major cause of DOD, probably because it is thought that something can be fed to fix the problem. However, genetics and trauma are likely more major causes.

Observations and data have linked large, heavy and fat foals with DOD problems. The key to nutritional DOD issues appears to be excessive feeding; either too much feed or feeding unbalanced rations, especially rations with too little forage. There is a significant difference in properly feeding foals for optimal growth and just excessively over-feeding them. Overfeeding can result from extreme amounts of grain (energy) and/or unbalanced ratios that may have improper amounts of energy in relation to protein or excessive levels and/or unbalanced ratios of minerals. Feeding unbalanced, high-energy rations may contribute to DOD, but feeding high-protein rations has not been associated with DOD.

Feeding foals so they grow too slowly can result in their being small or never reaching their genetic mature body size. A slow or decreased growth rate followed by a rapid growth rate is particularly dangerous. A group of Standardbred weanlings was fed free-choice for eight months while a second group was fed a restricted diet for four months then allowed free-choice feeding for four months. Two-thirds of the restricted group developed contracted tendons after one to four months of free-choice feeding.

Owners should strive for a steady and moderate growth curve. Data on expected ADG in Table V gives owners a guide to use for comparing their foals' growth. Where more rapid growth is needed for sales, shows and early performance, owners need to ensure a properly

balanced ration with adequate forages and keep foals from becoming too fat.

Since foals are normally large at birth, grow rapidly and mature rather early, owners must properly feed and manage mares in late pregnancy and feed and manage young, growing foals for natural growth with minimum risks of skeletal problems.

Table I. Wither Height Growth of Various Breeds

| Breed | 6 Months, % | 12 Months, % | 18 Months, % |
|-----------------|-------------|--------------|--------------|
| Shetland Ponies | 86 | 94 | 97 |
| Anglo Arab | 83 | 92 | 95 |
| Arabian | 84 | 91 | 95 |
| Quarter Horse | 84 | 91 | 95 |
| Thoroughbred | 84 | 90 | 95 |
| Percheron | 79 | 89 | 92 |

Table II. Mature Weight of Various Breeds

| Breed | 6 Months, % | 12 Months, % | 18 Months, % |
|---------------|-------------|--------------|--------------|
| Shetland | 55 | 75 | 84 |
| Anglo Arab | 45 | 67 | 81 |
| Arabian | 46 | 66 | 80 |
| Quarter Horse | 44 | 66 | 80 |
| Thoroughbred | 46 | 67 | 80 |
| Percheron | 40 | 60 | 74 |

Table III. Efficiency of Growth in Horses

| Weight, lbs | Efficiency, lbs Feed/lb Gain |
|-------------|------------------------------|
| 170 | 4 |
| 420 | 6.7 |
| 600 | 12-16 |

Table IV. Foal Growth

| Age, days | Weight, lbs | Average Daily Gain, lbs |
|-----------|-------------|-------------------------|
| Birth | 110 | --- |
| 30 | 210 | 3.35 |
| 60 | 305 | 3.15 |
| 90 | 375 | 2.35 |
| 120 | 435 | 2.00 |
| 150 | 490 | 1.85 |
| 180 | 540 | 1.65 |

Table V. Expected Average Daily Gain

| Age, months | Average Daily Gain, lbs. |
|-------------|--------------------------|
| 1 | 3.49 |
| 2 | 2.85 |
| 3 | 2.48 |
| 4 | 2.28 |
| 5 | 1.86 |
| 6 | 1.62 |
| 7 | 1.38 |
| 8 | 1.32 |
| 9 | 1.23 |
| 10 | 0.97 |
| 11 | 0.82 |
| 12 | 0.70 |

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