



RESEARCH ■ REVIEW >

RESEARCH

Use of Global Positioning Satellite to Evaluate Activity in Young Horses Fed Purina® Ultium® Growth Horse Feed

A SUMMARY OF RESEARCH CONDUCTED AT THE PURINA ANIMAL NUTRITION CENTER, EVALUATING THE USE OF GPS TECHNOLOGY TO INVESTIGATE ACTIVITY IN FOALS FED PURINA® ULTIUM® GROWTH HORSE FEED.¹

< INTRODUCTION >

Proper growth and development of young horses is mediated by a variety of factors including genetics, diet and management. In contrast to other growth feeds, Purina® Ultium® Growth derives its caloric content largely from fat and fiber, with less calories from starch and sugar. Previous research conducted at the Purina Animal Nutrition Center has determined that Ultium® Growth, when fed as directed produces consistent, desirable growth curves.² In addition to the nutrients received via diet consumption, the development of strong, functional bones, muscles and connective tissue is dependent on proper levels of activity in young horses. The objective of this study was to utilize Global Positioning Satellite (GPS) technology to evaluate the effects of diet, weaning, vaccination, castration and weather on the activity level of foals and young horses. It was hypothesized that weaning would increase activity while vaccination, castration and increased temperature would decrease activity.

< MATERIALS AND METHODS >

Quarter Horse foals (n=12; 7 colts, 5 fillies) were assigned to one of two dietary treatments, to which their dams were previously assigned. The groups received either Omolene #300®, a feed higher in starch and sugar, or Ultium® Growth a feed with more calories derived from fat and fiber. Nutrient analysis of feeds is depicted in Table 1. Foals were creep fed starting at 28 days of age, at a starting rate of 0.5 lb feed/day, increasing at 0.5 lb every other day until all horses reached a feeding rate of 8 lb feed/head/day. Foals consumed grass hay along with their dams during the creep feeding period, and then received 1% of their body weight in grass hay following weaning. Mares and foals were provided free choice access to water and white salt blocks. All feed refusals were recorded and consumption was calculated for all animals. Foals were housed along with mares in 12' x 14' stalls and received daily turnout based on dietary treatment in one of two 0.134 ha drylot paddocks until weaning at 140 days of age. Following weaning, foals were individually housed but continued to receive daily turnout in groups based on dietary treatment. Starting at 7 days of age and continuing until day 728 post foaling, all foals were fitted with GPS tracking devices (Garmin Astro DC20 Transmitter, 220 Receiver, MapSource, Version 6.11.6, ©1999-2006 Olathe, Kansas USA) during turnout hours (0700 to 1500) 5 days a week (Figure 1). Data were downloaded daily and activity was measured as number of legs (NL), defined as the number of "trips from point A to point B" for each horse on each day and leg length (LL), defined as total distance traveled by each foal in a given day. Alterations in activity associated with diet, weaning, castration and vaccination were evaluated using mixed procedure ANOVA (SAS Inst. Inc., Cary, NC). Effects on activity due to temperature were analyzed and utilized in the model. Significance was set at P<0.05.

¹Long term use of global positioning satellite to determine factors affecting spontaneous activity in young horses. Williamson KK, Gordon ME, Jerina ML, Rao MA, Raub RH. 2011. *Journal of Equine Veterinary Science* 31(5): 239.

²Gordon, M.E., Jerina, M.L., et al. 2010-2015. HR 127, HR 137, HR 154, HR 170, HR 179, HR 197.

< RESULTS >

Foal diet had no effect on activity level of foals as uniquely measured by Global Positioning Satellite in this study. Results from the study are displayed in Figure 2 for number of legs (NL) and Figure 3 for leg length (LL). The absence of differences between dietary treatments indicates that the source of calories (ie: starch and sugar vs. fat and fiber) does not play a significant role in the activity of young growing horses. Routine management of horses did positively and negatively influence activity of foals. Vaccination and weaning significantly decreased activity level measured both as leg length and number of legs, while castration resulted in an increased activity level. The surprising decrease in activity level associated with weaning may be due to a number of factors. At weaning, the absence of the mare to instigate movement or emotional distress of the foal may play a role in the decrease in activity. However, weaning occurred at a gradual pace with a single mare being removed on any given day in order to reduce potential stressors associated with weaning. Unsurprisingly, the reduced activity observed post vaccination may be associated with muscle soreness or immune challenges, common symptoms associated with routine intramuscular injections. The increase in activity level following castration may be due to best-management practices including mild forced exercise of geldings (while not wearing tracking devices) to reduce swelling post-castration that may have resulted in those animals becoming more athletically fit. Temperature is known to play a role in numerous areas of equine physiology including nutrient balance, electrolyte requirement, water intake and overall health. Predictably, hot temperatures reduced activity level in young horses in this study.

< CONCLUSION >

This study further demonstrates that when fed at recommended levels, Purina® Ultium® Growth can serve as an excellent source of nutrition for young growing horses. Further, this study demonstrated the use of GPS technology to evaluate activity in young growing horses. Overall, Purina® Ultium® Growth is an excellent source of nutrition for young growing horses and results of this research indicate that normal management practices may impact activity level of young growing horses regardless of diet.

TABLE 1

NUTRIENT ANALYSIS OF DIETS AS ANALYZED BY DAIRY ONE FORAGE ANALYSIS, ITHACA, NY. NOTE THE DIFFERENCES IN FAT, FIBER AND STARCH LEVELS.

	PURINA® OMOLENE #300®	PURINA® ULTIUM® GROWTH
CRUDE PROTEIN %	16.0	15.5
FAT %	5.0	9.5
FIBER (MAX) %	6.5	13.0
STARCH %	29.4	16.6
WSC %	10.6	10.0
ESC %	6.6	5.6
MCAL/KG	3.4	3.7

FIGURE 1

Global Positioning Satellite receiver worn by foals from 7 days of age through 728 days of age.



FIGURE 2

Effects of diet (Omolene #300® vs. Ultium® Growth), vaccination, weaning and castration on activity as defined by number of legs. Observation periods: Diet = 104 weeks, Vaccination = 5 days before and after vs. 5 days immediately following vaccination, Weaning and Castration = 30 days before and after.

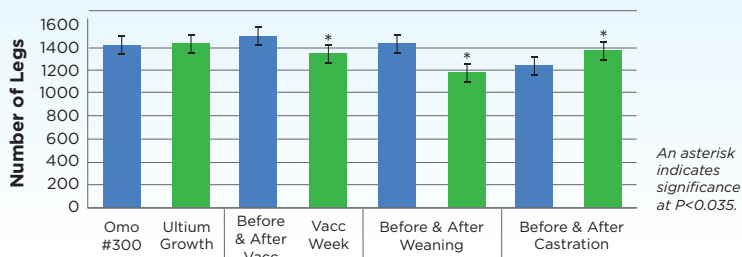
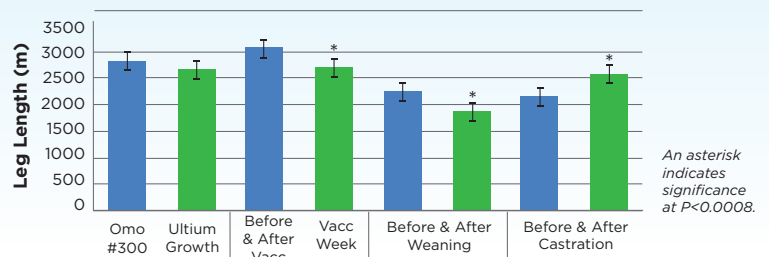


FIGURE 3

Effects of diet (Omolene #300® vs. Ultium® Growth), vaccination, weaning and castration on activity as defined by leg length. Observation periods: Diet = 104 weeks, Vaccination = 5 days before and after vs. 5 days immediately following vaccination, Weaning and Castration = 30 days before and after.



< FOR MORE INFORMATION > Contact your local Purina representative if you would like more information about this study.