



RESEARCH ■ REVIEW >

RESEARCH

The Effects of Feeding Purina® Equine Senior® Horse Feed with ActivAge® on the Inflammatory Status of Senior Horses

A SUMMARY OF MULTIPLE RESEARCH PROJECTS CONDUCTED AT THE PURINA ANIMAL NUTRITION CENTER AND AT THE UNIVERSITY OF KENTUCKY GLUCK EQUINE RESEARCH CENTER ON EVALUATING THE EFFECTS OF FEEDING PURINA® EQUINE SENIOR® HORSE FEED WITH ACTIVAGE® ON THE INFLAMMATORY SYSTEM RESPONSE IN SENIOR HORSES.^{1,2}

< BACKGROUND >

Inflammation is an important physiological response to a stressor in the horses' body, whether it be from injury, infection, or otherwise. While appropriate inflammatory responses are beneficial to the health of horses', inappropriate responses, whether they be inadequate or excessive, can impact the overall health of the horse. As horses age, they experience a phenomenon known as "inflamm-aging" which is characterized by increased systemic inflammation and an exaggerated inflammatory response to various stressors.³ ActivAge® prebiotic is a yeast fermentation product that is composed of beta glucans, vitamins, and other compounds with a high anti-oxidant capacity that is designed to support the aging horses' immune system, which is intertwined with the inflammatory system in horses. The objective of this series of research trials was to evaluate the effects of feeding Purina® Equine Senior® with ActivAge® to horses on their systemic levels of inflammation.

< MATERIALS AND METHODS >

A series of three research trials were conducted to evaluate the effects of feeding Purina® Equine Senior® with ActivAge® on various physiological parameters in senior horses.

Study 1: Thirty senior horses of mixed sex and breed were assigned to one of three treatment groups: traditional grain mix (TGM; n=10), Purina® Equine Senior® (ES; n=10), or Purina® Equine Senior® with ActivAge® (ESA; n=10). Horses were housed on a single pasture with free-choice access to mixed grass hay and fed their respective diets individually twice daily. Blood samples were collected at regular intervals throughout the study and evaluated for tumor necrosis factor-alpha (TNF- α), interleukin-6 (IL6) and interferon-gamma (IFN-g) via equine-specific ELISAs.

¹HR 192. The effects of ActivAge® on senior horses immune response to vaccination. Gordon, M.E. et al. 2013. Internal Research, PANC.

²HR 303. The effects of ActivAge® on the joint, metabolic, inflammatory, and overall health in senior horses. Jacobs, R.D. et al. 2020. Internal Research, PANC.

³Adams, A. Equine Disease Quarterly. 2012 April, 21 (2). The 'Older' Horse: An Immunological Perspective.

Study 2: Thirty-two senior horses of mixed-sex and mixed-breed were utilized in this study. Horses were randomly assigned to one of four treatment groups. Equine Senior® (n=8; ES), Equine Senior® + ActivAge® Level 1 (n=8; ESA1), Equine Senior® + ActivAge® Level 2 (n=8; ESA2), and Equine Senior® + ActivAge® Level 3 (n=8; ESA3) for a period of 84 days. All horses had free-choice access to mixed-grass hay and were housed on pasture. Horses were fed individually twice daily. Blood samples were collected at regular intervals throughout the study and evaluated for tumor necrosis factor-alpha (TNF- α), interleukin-6 (IL6) and interferon-gamma (IFN-g) via equine-specific ELISAs.

Study 3: American Quarter Horse geldings (n=10; average age= 19 \pm 0.6 yr; average BW= 587.5 \pm 22 kg) were used in this trial in a randomized cross-over design. Horses in the TRT group received 0.36 kg/ 45.5 kg BW per day of Purina® Equine Senior® Horse Feed formulated without ActivAge® in addition to a treatment pellet fed at 0.45 kg/day containing ActivAge®. Horses in the CON group received 0.36 kg/ 45.5 kg BW per day of Purina® Equine Senior® formulated without ActivAge® in addition to a control pellet of wheat middlings fed at 0.45 kg/day. All horses were offered 1.25% of their BW daily as Timothy grass hay. Diets were split evenly into AM (0700) and PM (1500) feedings daily. Horses were housed in individual stalls with individual drylot turnouts and had free-choice access to white salt blocks. Blood samples were obtained via jugular venipuncture every 2 weeks for 42 d and analyzed for serum amyloid A (SAA) and C-reactive protein (CRP) via equine-specific ELISAs.

< RESULTS >

Study 1: All horses gained weight and increased in body condition over time. Starting at day 105 following the start of supplementation, TNF- α levels were lower in horses in the ESA group compared to the ES group (**Figure 1**; $P < 0.05$). This continued through the end of the experimental period.

Study 2: All horses slightly lost weight but gained body condition over the course of the trial. The seasonal rise in TNF- α levels that typically occurs in the winter, when this trial was conducted, was observed in all treatment groups. However, levels of TNF- α increased in the ES group but remained unchanged in the ESA1, ESA2, and ESA3 groups by day 86 post dietary supplementation (**Figure 2**; $P < 0.05$).

Study 3: Horses maintained bodyweight and body condition throughout the course of the trial. Both the TRT and CON groups displayed elevated levels of SAA at the baseline measurement as was expected due to the age of the horses. However, SAA levels increased in the CON horses but remained consistent in the TRT horses (**Figure 3**; $P < 0.05$). No differences were observed in CRP levels between treatment groups or over time.

< CONCLUSIONS AND IMPLICATIONS >

The objective of these trials was to evaluate the effects of feeding Purina® Equine Senior® with ActivAge® to horses on markers of systemic inflammation. Tumor necrosis factor-alpha is a commonly measured cytokine, which at higher levels signifies increased inflammation. In study 1 and study 2, the data demonstrated that the horses consuming Purina® Equine Senior® with ActivAge® had lower systemic levels of TNF- α compared to those horses not consuming the ActivAge® prebiotic. In study 3, a different marker of systemic inflammation was evaluated. Serum amyloid A is a commonly measured protein that is used as an indicator of systemic inflammation. The data gathered in study 3 indicate that senior horses fed Purina® Equine Senior® with ActivAge® maintain more consistently lower SAA levels than those not consuming ActivAge®. Ensuring horses have an appropriate inflammatory response to challenges can help to support their overall health, well-being, and performance. As horses live more functional lives into their later years, feeding Purina® Equine Senior® with ActivAge® can support their nutritional requirements along with supporting their unique health needs.

FIGURE 1

Tumor necrosis factor-alpha levels in horses consuming either Purina® Equine Senior® with or without ActivAge® prebiotic or a traditional grain mix.

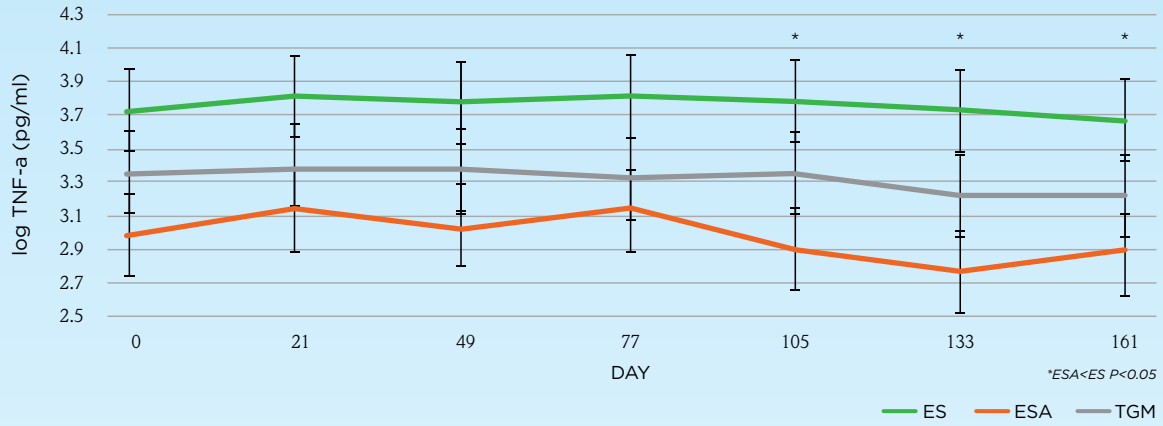


FIGURE 2

Tumor necrosis factor-alpha levels in horses consuming of Purina® Equine Senior® or Purina® Equine Senior® with ActivAge® prebiotic at three different inclusion levels.

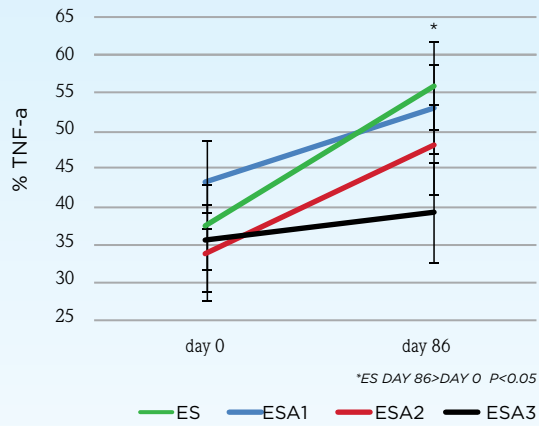
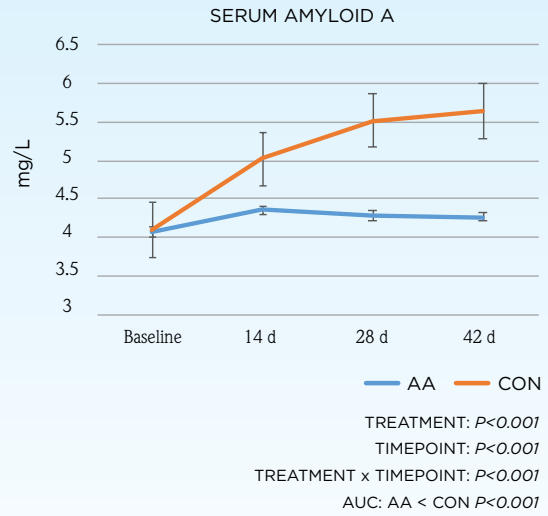


FIGURE 3

Serum amyloid A levels in horses consuming of Purina® Equine Senior® with and without ActivAge® prebiotic.



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