



## RESEARCH >

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## Purina® Enrich Plus® Senior Ration Balancer is Low in Starch and Sugar, Supporting a Very Low Glycemic Response to Feeding

A SUMMARY OF RESEARCH CONDUCTED AT THE PURINA ANIMAL NUTRITION CENTER, EXAMINING THE GLYCEMIC RESPONSE TO FEEDING OF PURINA® ENRICH PLUS® SENIOR RATION BALANCER.<sup>1</sup>

### < BACKGROUND >

As horses age, many experience a progressive decline in a variety of physiological functions. This includes a deterioration in their dentition, a reduction in their immune function coupled with increased systemic inflammation, and an overall reduced metabolic capacity. For some senior horses, this metabolic dysfunction can result in the need for a concentrate diet that elicits a very low glucose and insulin response to feeding, limiting the significant peaks in insulin concentration that are often associated with metabolic syndrome and an increased risk for laminitis or founder. The total amount of starch and sugar consumed is a function of the concentration in the diet along with the meal size. Purina® Enrich Plus® Senior Ration Balancer contains a guaranteed maximum of 13% starch and sugar and supplies a total of just 59 g of starch and sugar in a 1-pound meal, which is the daily recommended feeding rate for a 1000-lb horse. The total amount of starch and sugar consumed per meal can be further reduced if the daily ration is split into multiple feedings. To that end, the objective of this trial was to evaluate the glycemic response to feeding of a meal of Purina® Enrich Plus® Senior Ration Balancer. It was hypothesized that horses would have a very low glucose and insulin response to feeding.

### < MATERIALS AND METHODS >

Ten aged Quarter Horse geldings were utilized for this trial (mean age  $\pm$  SEM= 19.4  $\pm$  2.1 yr; mean BW  $\pm$  SEM= 561.82  $\pm$  6.5 kg). Prior to the initiation of the trial, all horses were deemed to be metabolically healthy with no insulin dysregulation. In short, a fasting blood sample was obtained from all horses and evaluated for glucose and insulin concentrations. Proxies were calculated to determine insulin sensitivity and included the Reciprocal of the Square Root of Insulin (RISQI) and the Modified Insulin to Glucose Ratio (MIRG). All horses utilized for the trial had a RISQI greater than 0.32 and a MIRG lower than 5.6 indicating that they were metabolically healthy.

Horses were housed in individual stalls with daily turnout into individual drylots. Horses were offered 2.0% of their body weight (BW) of a locally sourced moderate quality grass hay daily split into two equal feedings at approximately 0700 and 1300 daily. Additionally, horses were offered 0.45 kg/454 kg BW (1 lb/1000 lb BW) per day of Purina® Enrich Plus® Senior Ration Balancer split into two equal meals at the same time of hay offering (0.5 lb/1000 lb BW per meal). Horses had free-choice access to a plain white

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<sup>1</sup>Glucose and Insulin response to feeding of Enrich Plus Senior. HR 345. Jacobs RD and Gordon ME. 2021 Purina Animal Nutrition Center

salt block and clean water. Horses were acclimated to this diet over the course of 43 d. On d 44 a glucose and insulin response to feeding test was conducted for all horses. Jugular catheters were placed at approximately 0600 on the day of testing. Blood samples were obtained approximately 30 min prior to feeding and again immediately prior to feeding. Horses were then offered their AM ration of Purina® Enrich Plus® Senior Ration Balancer and blood samples were subsequently obtained at 30 min intervals for 6 hr post feeding resulting in a total of 14 samples obtained per horse.

Blood samples were obtained via the jugular catheter, and serum was collected from a serum separator tube, while plasma was collected from a vacutainer containing potassium oxalate/sodium fluoride. Plasma glucose was analyzed via a COBAS analyzer and serum insulin was determined via a colorimetric ELISA (Mercodia; Uppsala, Sweden) validated for the analysis of insulin in equine plasma samples

## < RESULTS AND IMPLICATIONS >

All horses readily consumed their daily rations and maintained BW and body condition throughout the course of the experimental period. Figures 1 and 2 show the average glucose and insulin response in horses consuming a meal of Purina® Enrich Plus® Senior Ration Balancer (0.5 lb/1000 lb BW) along with reference ranges relative to typical glucose and insulin values in horses.

Taken together, these data indicate that consumption of Purina® Enrich Plus® Senior Ration Balancer results in a very low glucose and insulin response to feeding when fed as directed and divided equally into two meals per day. While this is due largely to the very low NSC level formulated into the product, along with the smaller meal size, previous research also indicates that the prebiotic ActivAge® supports the metabolic function of senior horses.<sup>2</sup> Purina® Enrich Plus® Senior Ration Balancer is formulated specifically to support the needs of the senior horse with lower calorie needs. Its unique inclusion of Outlast® gastric support technology, ActivAge® prebiotic technology, and Easy-Soak™ manufacturing characteristics support the altered physiology of senior horses as they progress through the aging process.

<sup>2</sup>Physiological effects of ActivAge prebiotic on senior horses. HR 303. Jacobs RD and Gordon ME. 2020. Purina Animal Nutrition Center

FIGURE 1 Relative glucose response to feeding from horses consuming a meal of Purina® Enrich Plus® Senior Ration Balancer.

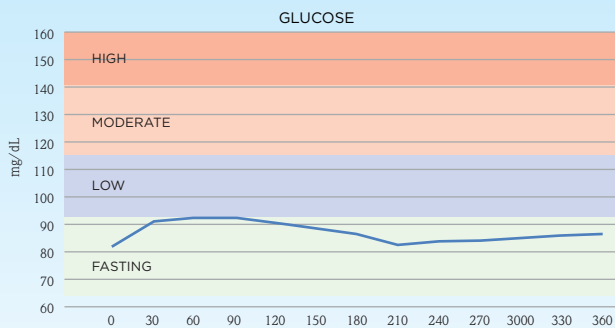
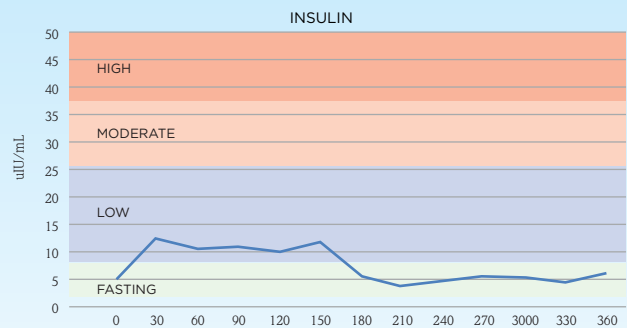


FIGURE 2 Relative insulin response to feeding from horses consuming a meal of Purina® Enrich Plus® Senior Ration Balancer.



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