PURINA

RESEARCH REVIEW >

Purina® EquiTub™ with ClariFly® Supplement: Can ClariFly® be Found in the Blood Following Consumption?

A SUMMARY OF RESEARCH CONDUCTED AT THE PURINA ANIMAL NUTRITION CENTER, IN CONJUNCTION WITH CENTRAL LIFE SCIENCES EXAMINING WHETHER THE ACTIVE INGREDIENT IN CLARIFLY® IS PRESENT IN EQUINE BLOOD FOLLOWING CONSUMPTION OF PURINA® EQUITUB™ WITH CLARIFLY®[1]

< INTRODUCTION AND BACKGROUND >

Purina® EquiTub™ with ClariFly® is a premium self-fed supplement designed specifically for horses. In addition to unique technologies like Purina® Outlast® Gastric Support Supplement and Purina® Amplify® High Fat Supplement, EquiTub™ is also formulated with ClariFly® larvicide. Flies are not only bothersome for horses and owners but can also be vectors for disease, and in some horses, elicit severe reactions. While there are many options available to help control the population of flies around your horses, ClariFly® approaches the problem through a unique feed-through solution.

Many species of flies that irritate horses and their owners lay their eggs in manure piles. Once the eggs hatch, the larvae emerge into the feces with a ready supply of nutrients necessary to support their rapid maturity into adults. ClariFly® contains a larvicide called diflubenzuron that functions to inhibit the maturation of house and stable fly larvae into adult flies. Unlike conventional larvicides that work by attacking the nervous system of the fly, ClariFly® stops the formation of the flies' exoskeleton by inhibiting chitin synthesis, a critical component in the maturation of flies. ClariFly® is considered a feed-through fly control system because it is deposited in the feces of the horse by the horse itself. Horses offered Purina® EquiTub™ with ClariFly® consume the product and the diflubenzuron passes through the gastrointestinal tract of the horse and is deposited in the manure piles as the horse defecates.

ClariFly®, a product of Central Life Sciences, has passed through rigorous testing by the Environmental Protection Agency (EPA) to ensure its efficacy and safety to the environment. The equine research group at Purina Animal Nutrition, in partnership with Central Life Sciences was interested in determining whether diflubenzuron or its residues were absorbed in the gastrointestinal tract of the horse. To that end, the objective of this trial was to determine whether horses offered Purina® EquiTub™ with ClariFly® had detectable levels of diflubenzuron in plasma samples.

[1]Jacobs, RD, Jerina, ML, and Gordon ME. HR 267- Purina® EquiTub™ with ClariFly® trial. Purina Animal Nutrition Center, 2018.

< MATERIALS AND METHODS >

Ten (n=10) mature horses (612.5 ± 18 kg BW) were utilized for this trial consisting of equal numbers of mares and geldings. Five (n=5) horses were housed on pasture with free-choice access to mixed fescue grass, while five (n=5) horses were housed in a drylot. The horses in drylot were group offered 2.0% BW per day as a locally sourced grass hay ($\bar{x}$=12.25 kg/hd/day). The horses on pasture or in the drylot were provided with free choice access to Purina® EquiTub™ with ClariFly® 24 hours daily for a total period of five days. An additional 5 horses (n=5) were utilized as a negative control group and were housed on a separate mixed fescue pasture and were group offered 1.81 kg Purina® Strategy GX® Horse Feed twice daily. The day that the tubs were offered was considered day 0 with horses having access to the Purina® EquiTub™ with ClariFly® from day 0 through day 4. Plasma samples were obtained via jugular venipuncture into heparin containing tubes and immediately centrifuged to collect plasma from all horses on days -5 (baseline), 1, 4, and 11. Also on those days, a fecal sample was obtained via fecal grab sample from all horses and immediately frozen at -20°C. All fecal and plasma samples underwent appropriate extraction and were analyzed via liquid-chromatography with tandem mass spectrometry for diflubenzuron with a Limit of Detection (LOD) and the Limit of Quantification (LOQ) of *2 ng/g* and *10 ng/g,* respectively. One *ng/g* is the same as one part per billion (ppb).

< RESULTS >

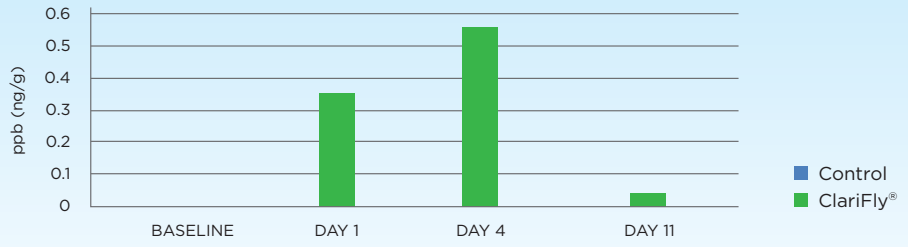
All horses remained healthy through out the course of the experiment. Horses in the drylots and pasture offered the Purina® EquiTub™ with ClariFly® all maintained bodyweight and displayed no negative effects of the dietary change. Horses in the drylot consumed all offered hay daily. Previous research at the Purina Animal Nutrition Center indicated that horses in drylot would consume an average 2.0 kg of Purina® EquiTub™ with ClariFly® daily, while horses on pasture would consume an average of 0.9 kg per head daily. The horses utilized for this trial were naïve to the supplement and as such displayed slightly higher consumption rates with drylot horses consuming an average of 3.1 kg per head daily and horses on pasture consuming 1.7 kg per head daily. At no timepoint was diflubenzuron present in plasma samples from either horses consuming Purina® EquiTub™ with ClariFly® or from negative control horses. Fecal samples from horses in the negative control group contained no diflubenzuron at any timepoint. No differences were observed in the levels of diflubenzuron between horses on pasture or those in drylot, and as such the data were combined. Diflubenzuron levels from horses offered the Purina® EquiTub™ with ClariFly® are displayed in **Figure 1**. Peak levels of diflubenzuron were present in fecal samples of horses consuming product containing ClariFly® on day 4 with remnants appearing in fecal samples on day 11, 7 days following consumption.

< IMPLICATIONS >

The objective of this trial was to determine whether the larvicide diflubenzuron, the active ingredient in ClariFly®, would be present in plasma samples of horses consuming Purina® EquiTub™ with ClariFly®. ClariFly® is an EPA registered feed additive that is designed to inhibit the maturation of house and stable fly larvae into adult flies by passing through the gastrointestinal tract of horses and depositing in the manure piles. These data indicate that ClariFly® successfully passes through the GI tract of the horse and deposits in the feces while not being absorbed into systemic circulation. Further, horses consuming Purina® EquiTub™ with ClariFly® displayed no adverse reactions and readily consumed the supplement.

FIGURE 1

Diflubenzuron in feces of control horses and horses consuming Purina® EquiTub™ with ClariFly®



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

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