



FLAIR® STRIPS

CLINICAL STUDIES OVERVIEW

CLINICAL STUDY I

Poole, David C., PhD et al. "Effects of External Nasal Support on Pulmonary Gas Exchange and EIPH in the Horse." *Journal of Equine Veterinary Science*. Volume 20: Number 9, 578-585, 2000.

Kansas State University College of Veterinary Medicine

Seven horses were exercised on a high-speed treadmill with and without FLAIR® Equine Nasal Strips. When they were wearing nasal strips, VO_2 was significantly reduced indicating a reduction in the work of breathing. Bronchoalveolar lavage (BAL) fluid analysis also showed a significant reduction in the number of red blood cells recovered from the lungs of horses when wearing FLAIR Strips as compared to the control run.

CLINICAL STUDY II

Kindig, Casey A. PhD et al. "Efficacy of Nasal Strip and Furosemide in Mitigating EIPH in Thoroughbred Horses." *Journal of Applied Physiology*. Volume 91: 1396-1400, 2001.

Kansas State University, College of Veterinary Medicine

Five thoroughbred horses were exercised on a high-speed treadmill at near maximal efforts four times under the following conditions: control; wearing FLAIR Equine Nasal Strips; medicated with Furosemide; wearing FLAIR Equine Nasal Strips and medicated with Furosemide. Horses wearing FLAIR Strips showed a significant reduction of EIPH based on analysis of BAL fluid.

CLINICAL STUDY III

Goetz, Thomas E et al. "Nasal strips do not affect pulmonary gas exchange, anaerobic metabolism, or EIPH in exercising Thoroughbreds". *Journal of Applied Physiology*. Volume 90: 2378-2385, 2001. and Editor requested comments by Kindig, Casey A. PhD et al. "Nasal Strips and EIPH in the Exercising Thoroughbred Racehorse, id at 1908-09 and Reply, id at 1909-10.

University of Illinois at Urbana-Champaign, College of Veterinary Medicine

Seven thoroughbred horses were subjected to two sets of experiments, control and nasal strip, in random order 7 days apart. Simultaneous measurements of core temperature, arterial and mixed venous blood gases/pH and blood lactate and ammonia concentrations were made at rest, during submaximal and near-maximal exercise, and during recovery. Statistically significant differences between the control and nasal strip experiments were not reported. The authors, however, failed to measure pulmonary gas exchange. The authors further stated "Also, all horses experienced EIPH in both treatments." However, there is no known method to eliminate EIPH. The Editor of the publication requested comment by another group of researchers finding contrary results regarding EIPH. Of significant importance is that, in contrast to this study, other studies based on quantitative evaluation have shown that FLAIR Strips significantly reduce EIPH. Due to lack of quantitative evaluation, this study is inconclusive as to whether the Strips reduced EIPH. Also, photographs from the study showed that placement of the nasal strips was not correct; it was too far above the nostrils.

CLINICAL STUDY IV

Geor, Ray J. PhD et al. "Effects of an External Nasal Strip and Furosemide on Pulmonary Haemorrhage in Thoroughbreds Following High-Intensity Exercise." *Equine Veterinary Journal*. Volume 33: Number 6, 577-584, 2001.

Kentucky Equine Research, Inc.

Eight thoroughbred horses were exercised at 120% maximal oxygen consumption (VO_{2max}) by sprinting on a high-speed treadmill under the following conditions: control (C); wearing FLAIR Equine Nasal Strips (NS); medicated with furosemide (F); wearing FLAIR Equine Nasal Strips and medicated with furosemide (NS+F). Horses treated with furosemide carried weight equal to that caused by fluid loss after furosemide administration. Horses wearing FLAIR Strips showed a significant reduction of EIPH based on analysis of





BAL fluid. Horses injected with furosemide showed a greater reduction in EIPH. Both VO₂ and CO₂ were significantly lowered in the NS and NS + FR trials over control. The researchers concluded that “the external nasal strip appears to lower the metabolic cost of supramaximal exertion in horses.”

CLINICAL STUDY V

Holcombe, Susan J. VMD, PhD et al. “Effect of Commercially Available Nasal Strips on Airway Resistance in Exercising Horses.” American Journal of Veterinary Research. Volume 63: Number 8, 1101-1105, August 2002.

Michigan State University, College of Veterinary Medicine

Six horses were exercised on a treadmill at speeds corresponding to 100 and 120% maximal heart rate with and without application of FLAIR Strips. Tracheal pressures, airflow, and heart rate were measured. Main effects of the nasal strip were a significant decrease in inspiratory airway resistance and a significantly lower negative peak tracheal inspiratory pressure. The researchers stated that nasal strips probably decrease the amount of work required for respiratory muscles in horses during intense exercise and may reduce the energy required for breathing.

CLINICAL STUDY VI

Valdez, Sandra C., MVZ et al. “Effect of an External Nasal Dilator Strip on Cytologic Characteristics of Bronchoalveolar Lavage Fluid in Thoroughbred and Racehorses.” Journal of American Veterinary Medical Association. Volume 224: Number 4, 558-561, February 15, 2004.

University of California, Davis, College of Veterinary Medicine

23 thoroughbred racehorses in active training at Golden Gate Fields Racetrack in California were raced with and without FLAIR Equine Nasal Strips. All horses were administered furosemide 4 hours before each race. Mean red blood cell count in BAL fluid in horses with severe bleeding was significantly reduced when wearing nasal strips. The mean lymphocyte count was also significantly reduced in BAL fluid of horses when wearing nasal strips.

CLINICAL STUDY VII

McDonough, P. et al. “Effect of Furosemide and the Equine Nasal Strip on Exercise-Induced Pulmonary Haemorrhage and Time-to-Fatigue in Maximally Exercising Horses.” Equine and Comparative Exercise Physiology. Volume 1: Number 3, 177-184, August 2004.

Kansas State University, College of Veterinary Medicine

Six thoroughbred horses were exercised on a treadmill at near-maximal running to fatigue under the following conditions: control (C); wearing nasal strips (NS); medicated with furosemide (NS + F); and wearing nasal strips and medicated with furosemide (NS+F). “A very interesting, and novel, finding of the current investigation is that while both FUR and the NS reduced EIPH severity, the NS was equally as effective as FUR during maximal running to fatigue.” Both FUR and NS caused an increased time-to-fatigue. As in previous studies of the nasal strip, VO₂ was reduced, probably due to reduction of the O₂ cost of breathing.

CLINICAL STUDY VIII

Howard H. Erickson, DVM, PhD, et al. “Review of Alternative Therapies for EIPH”, Proceedings of the 53rd Annual Convention of the American Association of Equine Practitioners, Volume 53, 68-71, 2007.

Kansas State University, College of Veterinary Medicine

Almost 400 Thoroughbred horses that wore nasal strips were evaluated at Calder Racecourse in Florida in 1999-2000. The horses with the strip had a win percentage 3.4% higher than horses that did not wear a strip. Horses wearing a nasal strip also had a 15% decrease in the interval to the next race (23 days) compared with the race-to-race interval before wearing a nasal strip (29 days).

