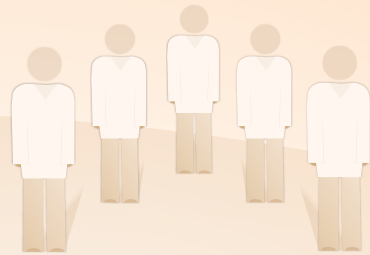


New animal safety and well-being studies confirm ZILMAX® (zilpaterol hydrochloride) safety

DIFFERENT STUDIES. SAME CONCLUSION.

Presented at the 2014 Joint Annual Meeting of the American Society of Animal Science, American Dairy Science Association and Canadian Society of Animal Science

- ✓ USDA-ARS with University of Nebraska-Lincoln
- ✓ Kansas State University
- ✓ Oklahoma State University
- ✓ Texas Tech University
- ✓ West Texas A&M University



Stress Indicators



Temperature
Normal, healthy range



Heart Rate and Handling Stress
Normal, healthy range



Respiration
Evaluated as noted on label

Mobility/Behavior Indicators



Temperament
Normal, healthy range



Feed and Water Intake
Normal, healthy range



Mobility
No difference



ZILMAX Has No Negative Effect on Animal Well-being¹⁻¹² When Used According to Label

Physiology Indicators



Blood Chemistry
Normal, health range

Results corroborate more than 65 studies and observations conducted by universities and third-party experts since FDA's approval in 2006.

For more information, go to www.zilmax.com.

References

- ¹FDA. Freedom of information summary. Original new animal drug application NADA 141-258. Zimax (zilpaterol hydrochloride) Type A medicated article for cattle fed in confinement for slaughter. <http://www.fda.gov/downloads/AnimalVeterinary/Products/ApprovedAnimalDrugProducts/FOIADrugSummaries/ucm051412.pdf>. 2006. Accessed Apr. 26, 2007.
- ²Woiodo, R. and Grandin, T. Field study on the effect of zilpaterol on the behavior and mobility of Brahman cross steers at a commercial feedlot. Final Report to the National Cattlemen's Beef Association. 2013.
- ³Frese, D. A., Reinhardt, C. D., Bartle, S. J., Rethorst, D.N., Bawa, B., Thomason, J. D., Loneragan, G. H. and Thomson, D. U. Animal health and animal welfare implications of beta adrenergic agonists (BAA) in feedlot cattle. Final Report to the State Beef Councils. 2014.
- ⁴Hales, K. E., Shackelford, S. D., Wells, J. E., King, D. A., Hayes, M. D., Brown-Brandl, T. M., Kuehn, L. A., Freetly, H. C. and Wheeler, T. L. Effects of feeding dry-rolled corn-based diets with and without wet distillers grains with solubles and zilpaterol hydrochloride on performance, carcass characteristics, and heat stress in finishing beef steers. *J. Anim. Sci.* 2014. 92:4023-4033.
- ⁵Merck Animal Health, Research on file, Report #2014-7: The effects of technology use in feedlot production systems on the behavior and mobility of finishing steers.
- ⁶Merck Animal Health, Research on file, Report #2014-7: The effects of technology use in feedlot production systems on heat stress of finishing steers.
- ⁷Merck Animal Health, Research on file, Report #2014-7: The effects of technology use in feedlot production systems on health parameters of finishing steers.
- ⁸Merck Animal Health, Research on file, Report #2014-9: The effects of Zimax on the general well-being of feedlot cattle.
- ⁹Merck Animal Health, Research on file, Report #2014-9: MRI provides objective diagnosis of hoof health in feedlot cattle supplemented with Zimax.
- ¹⁰Merck Animal Health, Research on file, Report #2014-9: The effects of Zimax on various physiological indicators of thermal regulation in black-hided feedlot steers and heifers during moderate heat stress.
- ¹¹Merck Animal Health, Research on file, Report #2014-5: Objective movement of calf-fed Holstein steers fed in confinement when supplemented with Zimax.
- ¹²Samuelson, K. L., Hubbert, M. E. and Loest, C. A. Effects of Zimax on performance, carcass characteristics and traveling ability of crossbred steers consuming rations with different concentrations of urea. New Mexico State University, Clayton Livestock Research Center, Agriculture Experiment Station, U.S. Department of Agriculture. April 2014.

Merck Animal Health

For more information, go to www.zimax.com.

IMPORTANT SAFETY INFORMATION

Zimax has a withdrawal period 3 days prior to slaughter. Not for use in animals intended for breeding. Do not allow horses or other equines access to feed containing zilpaterol. Do not use in veal calves. Not to be fed to cattle in excess of 90 mg zilpaterol/head/day in complete feed. If pen consumption of complete feed exceeds 26.5 lb/head/day (90% dry matter basis), zilpaterol should not be fed in complete feed.

For complete safety information, please refer to the product label.

Zimax[®]
(zilpaterol hydrochloride 4.8%)