Colorado Science and Engineering Fair

2025 Individual Project Abstract Form

Please print 2 copies of the completed form. Sign both copies, keep 1 for your notebook and submit 1 copy to your Regional Fair Director with your other paperwork.

Title of Project: Can You Hear Me Now? A Study of the Efficacy of Equine Ear Plugs

Finalist's Name: Addie Aldridge-Paulson

School and City: Sargent Middle School

Sponsor's Name: Terri Rae Paulson

Category: Animal Sciences

Division: Junior (grades 6 - 8)

Abstract (250 words or less):

Horses possess a highly developed sense of hearing, detecting sounds ranging from 55 Hz to 33,000 Hz. Due to their sensitivity, loud or sudden noises can easily startle them, potentially endangering both horse and rider. This study aimed to evaluate the effectiveness of various equine earplugs in reducing sound levels. A model horse ear was constructed using a two-liter plastic bottle, two microphones, and soundproofing materials. Six types of earplugs were tested: Pomms (smooth and golf), Cashel, YJ Tails, Equinavia Budz, and Silly Sounds. The experiment measured the reduction in decibels across various sounds, including crowd noise, horse vocalizations, gunshots, and cannon fire.

A digital audio workshop was used to record the sound and determine the loudness in decibels. Decibel reduction was calculated by subtracting the test ear plugs decibels from the control.

Results indicated that Pomms Smooth earplugs were the most effective at reducing noise by an average of 17.4 dB, followed by Cashel and Golf Pomms. Equinavia Budz and YJ Tails provided moderate sound reduction, while Silly Sounds proved least effective. Gunshots and cannon fire were the hardest to block, whereas crowd noise and horse vocalizations were muffled more successfully. Cost analysis revealed that Cashel earplugs were the most expensive costing the consumer $8.75 for one earplug compared to the Silly Sounds were the least costly costing $1.75 per plug, but they were also the least effective.

Findings support the hypothesis that Pomms Smooth earplugs block the most noise. Additionally, the study suggests that alternative, more cost-effective options such as human earplugs or tampons may provide similar results. This research highlights the importance of noise reduction for equine safety and suggests further testing on live horses to assess comfort and usability.

I hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I also attest that the above properly reflects my own work.

Finalist's Signature: Date:

In addition, all students must complete the ISEF Student Checklist (1A), Research Plan, Approval Form (1B), and Checklist for Adult Sponsor (1), and any other ISEF forms required for this type of project. See the International Rules and Guidelines for form requirements. Return COPIES of all of these forms to your Regional Fair Director with you Finalist Verification/Permission Form. **A signed copy of this form must be included in your notebook.**