



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Megan M. Lee	Project Number S1006
Project Title Ammonia: The Passed Gas	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My project was to determine if a horse's diet affects the amount of ammonia produced in their manure. I believe that, when boiled, the manure sample from a pregnant female horse will have a higher concentration of ammonia than the manure samples from three other horses.</p> <p>Methods/Materials Manure samples from four different horses were collected. 10g of manure was measured, placed in a clean flask, and then filled with 200mL of deionized water. The pH level of the water/manure mixture was measured. A beaker was then filled with 500mL of deionized water and its pH level measured. A hole was made through a cork stopper. One end of a U shaped piece of glass tubing was inserted into the stopper. The stopper was placed in the flask. The other end of the tubing was placed over the beaker of deionized water. The flask was placed directly on the hot plate/griddle while the beaker was set to the side away from the heat. The hot plate/griddle temperature was set to 5 and I waited for the manure/water mixture to boil. The mixture continued to boil until the water moved through the tubing into the beaker. I waited until the water moving through the tubing into the beaker turned a light shade of green and then turned off the hot plate/griddle. The pH level of the water in the beaker was measured a second time. Process was repeated for all manure samples. The pH levels were recorded and compared. The second pH level of the beaker water was plugged into the pOH formula. I then solved the equation to determine the ammonia content and compared those findings.</p> <p>Results The manure from the outdoor female pony using a salt lick had the higher ammonia level while the manure from the male horse living indoors consistently had the lower concentration of ammonia. Meanwhile, the manure from the pregnant indoor female horse had ammonia levels that were often equal to that of the male horse living outdoors. There were no changes in the ammonia level from the pregnant female after she delivered her foal.</p> <p>Conclusions/Discussion My conclusion did not support the project's hypothesis. The female pony living outside utilizing a salt lick had the higher ammonia concentration in its manure as opposed to the other subjects not having access to salt licks. Living conditions did not affect the final results. This was concluded by a testing method using a beaker and tubing system to extract ammonia from each manure sample.</p>	
Summary Statement To determine the relationship between a horse's diet and the affect it has on the ammonia level in their manure.	
Help Received I used lab equipment belonging to Mr. Beach's chemistry class; my test horses belong to my riding instructor, Stacey Turner; my grandparents allowed me the use of their home to conduct the bulk of this experiment; my mother and aunt transported me where I needed to go to get this project completed.	