



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> Megan M. Lee	<b>Project Number</b> <b>S1007</b>
<b>Project Title</b> <b>Ammonia: The Passed Gas, Part II</b>	
<b>Objectives/Goals</b> My project was to determine if a horse's diet can be altered so that the ammonia level in the manure will be equal to that of cow manure. I believe that when the horse's diet is altered with a fiber supplement, the ammonia level in the manure will be equal to that of the cow manure samples	
<b>Abstract</b> <b>Methods/Materials</b> A horse's diet was altered with a daily fiber supplement equal to 195g per day for 5 days. Manure samples from a horse and a cow 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 was 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. The flask was placed directly on the hot plate/griddle while the beaker of water 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. Once the water had moved through the tubing, I turned off the hot plate/griddle. The pH level of the water in the beaker was measured a second time. This 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 the findings.	
<b>Results</b> After the horse's diet had been altered, it's manure proved not only to have the same ammonia level of that of a cow, but was in fact actually lower than the cow's.	
<b>Conclusions/Discussion</b> My conclusion supported the project's hypothesis. By altering the horse's diet with a fiber supplement, the ammonia level in its manure was equal to as well as lower than that of the cow. This was concluded by a testing method using a beaker and tubing system to extract ammonia from each manure sample.	
<b>Summary Statement</b> To determine if by altering a horse's diet it is possible to lower the ammonia level of manure to be equal to that of a cow's manure ammonia level.	
<b>Help Received</b> I used lab equipment from my school, my horse for the test horse, steer from the Beef Unit of Cal Poly San Luis Obispo, my grandparents for continued use of their home, and my mother for driving me and my project to where I needed to be.	