acids. The first group of six was injected twice in this order: first group of six injected, second group of six injected, followed by repeated injection of the first group.

Figure 2 - Vacuum/Pressure Setup

The method involves a setup with no moving parts, consisting of several containers linked together by tubing. The tubing initiates from a test valve run by Labview which controlled the valve, cycling the specimens by expelling air through the tubes and then using suction to draw the air in. The tubing was in turn connected to two traps or reservoirs and then in turn connected to two more containers that were filled with the 20% formic acid solution. Connected to these acid filled containers was more tubing, which was then inserted into the drilled holes of the specimen. Clamps held the apparatus and the reservoirs were placed above the filled containers as to create the best pressure/vacuum system obtainable. The air was turned on and allowed to equalize throughout the system. The pump was initialized and cycling started. The air pressure needed to be at less than 1 PSI, in order to stabilize the amount of bubbling in the acidfilled containers produced so that no overflow of solution into the reservoirs occurs. This method was used in order to maintain pressure inside the vertebral body, which will allow it to permeate throughout the bone and cause expansive demineralization, and not merely around the drilled hole. This process was run for a period of 60 minutes for each vertebral body.

Figure 3 - Injection of the sheep vertebral body with formic acid

The specimens were then placed in separate plastic containers for storage and chilled in a refrigerator for preservation and allowed demineralization time for the acid exposed bone.

Figure 4 - Vacuum/Pressure Setup (Close View)

The specimens were X-rayed for a second time, 24 hours after each injection using the DEXA and a BMD was obtained as well as a visual image. The X-ray images and the two measurements of BMD were compared and calculations made to determine demineralization and assessment of the level of osteoporosis of the vertebral body compared to the accepted range.

RESULTS

The results showed that through the first round of injection the bone showed about 10%, on average, BMD loss due to demineralization caused by the formic acid. The second round yielded another 10%, on average, BMD loss. These averages show that at each injection, about the same degree of the BMD loss was obtained, with the 2nd injection yielding a slightly increased BMD change compared to the 1st. But with the vastly variable BMD percentage changes obtained, these results are not reliable. The data in Table 1 reveals three groups. The first group contains just the specimen #3, in which a 7% increase of BMD occurred. It is impossible for the bone to gain BMD, and this one specimen recorded a DEXA BMD that contradicts the predictable bone loss.

Specimen 3's second injection DEXA scan revealed a significant BMD loss from after the first which shows that something was incorrect with the scan itself. The second row of data contains Specimens 4, 7, 8, and 9. A typical