

## INTRODUCTION

Uncovering the relationship of antibody or adrenal response to the resistance of disease has been studied in mice, poultry, and now pigs. Every year the swine industry has been paying more than \$1.5 billion towards diseases in pigs. Scientists performed different tests to see if they could find a solution where disease in pigs would decrease while performance and productivity increased. Scientists studied the immune and stress levels in many different pigs through several blood tests. Some of the pigs they used in this study were Meishan, Yorkshire, Berkshire, Durocs, and White X pigs. Although studies have been done to direct the connection between breeds, immune, and stress levels in pigs, incomplete information is available due to the many different pig breeds and all of their different ages. Scientists predicted that depending on the pig's breed, sex, and age pigs are more prone to disease because of the difference in their immune and cortisol levels. The hypothesis from this study is pigs have different baseline immune status and stress levels based on their breed, sex and age.

## MATERIALS AND METHODS

To test immune and stress levels piglets were weaned from their mothers when they were 17 to 21 days old. The pigs were put into the scientist's lab where they had all the necessities for life. The pigs were provided with a self waterer and feeder filled with corn and soybeans, and the lights were kept on for 12 hours and then off for 12 hours. Scientists kept the pig's nursery air temperature at 24°C and the humidity at 50%. Scientists gave the pigs 7 days to adjust to their new environment. After the pigs were adjusted scientists started sampling blood. Scientists drew blood at 4, 8, and 12 weeks. With microscopes, scientists figured out the pig's white blood cell count. To figure out the pig's cortisol levels, scientists decided to also use a Coat-A-Count cortisol kit.

## RESULTS

From the experiments and results they received, scientists changed their hypotheses. Scientists discovered that there was no difference between the genders when they were testing immune, cortisol, and performance levels. When counting the white blood cells, scientists learned that the count differed based on what breed and age the pig was. Berkshire pigs had the greatest count at week 4 but by week 12 Berkshire pigs were the least. Using the Coat-A-Count kit scientists found that pig's stress levels differ based on their age and breed. Meishan pigs always had the higher levels and Yorkshire pigs had the lowest levels at 4 and 8 weeks. By 12 weeks all pig breeds showed similar concentration, but Meishan pigs were still at the higher levels. As for pig performance, White X and Yorkshire pigs had the greatest weight gain when compared to the Meishan and Durocs pigs. Throughout the length of the experiments, Yorkshire pigs had the greatest weight gain.

## DISCUSSION

Scientists made sure to handle all pig breeds the same so they would know what really played a factor and what did not. From doing this, scientists figured out that stress levels varied by breed and not gender. Between the five pig breeds that were evaluated, scientists noticed that there was a difference in their immune and stress levels based on their breed and age. Scientists concluded that Meishan and White pigs have different stress levels due to their different types of bodies. It was also reported that Meishan pigs reach puberty about 100 days earlier than White X pigs. Meishan pigs had the most natural killer cytotoxicity which means they are probably more effective at fighting viral challenges. White X pigs had the most neutrophil chemotaxis and phagocytosis which means they are probably better at protecting themselves against bacteria.

However, there is still the wonder if the advantages that the pigs have will change as the pigs age.

## Bibliography

1. Sutherland, Rodriguez-Zas, Ellis, and Salak-Johnson. "Breed and age affect baseline immune traits, cortisol, and performance in growing pigs" Journal of Animal Science (2005): 2087-2095