Public Abstract.
Henry Mesa Echeverri
Ph. D.
Animal Science.
Selection for Placental Efficiency in Swine.
Advisor: Dr. William R. Lamberson.

_____
Advisor's signature

Graduation Term: Fall 2004

The economic efficiency of the swine industry can be improved by increasing the number of piglets weaned by each female. Previous research in a Chinese pig breed with a high number of piglets born indicated that increasing placental efficiency (the ratio of a piglet's birth to placental weight) would provide a system to increase number born. To test this idea, four generations of genetic selection were performed by using a mathematical equation including number born, birth weight, and placental weight. Both placental weight and efficiency responded to selection in the expected manner, but number born unexpectedly decreased when placental efficiency increased. It is possible that the physiological mechanisms that allow the Chinese breed to produce high number born through increased placental efficiency are not present in the breeds commonly used for pork production.

Currently, the average number born in the U.S is 11 piglets, but only nine are weaned. In search of strategies to reduce this loss, an analysis was performed using the data of the selection experiment to identify factors affecting piglet survival. In agreement with many other experiments, it was found that birth weight is the main factor affecting piglet survival. Probability of survival is greatly reduced for piglets weighing less than average at birth, but increasing birth weight above the average does not result in substantial improvements in survival. The results suggest that selection for litters with a homogeneous birth weight could result in improvement in piglet survival before weaning.