distance moved treatments. Longissimus glycolytic potential was also measured after the distance moved treatments on a subset of 32 pigs. Data were analyzed using PROC MIXED and PROC REG of SAS. Handling intensity x distance moved interactions existed (P<0.05) for several blood acid-base measurements. In general, there was no effect of distance moved on these traits when pigs were previously handled gently. However, when pigs were previously handled aggressively, pigs moved 125 compared to 25 m had higher (P<0.05) blood lactate and lower (P<0.05) blood pH, bicarbonate, and base-excess. Pigs transported at 0.39 compared to 0.49 m²/pig had larger (P<0.01) increases in creatine kinase values, however, transport floor space did not affect any other measurements. Data were also analyzed by the number of stressors (aggressive handling, restricted transport floor space, and moved 125 m during handling) experienced by each pig (0, 1, 2, or 3). As stressor number increased, there was a linear increase (P≤0.01) in rectal temperature, blood lactate, and longissimus lactate and a linear decrease (P<0.01) in blood pH, bicarbonate, and base-excess. These data suggest that the stressors evaluated had additive effects on rectal temperature, longissimus lactate values, and blood acid-base balance.

Key Words: Pig, Handling, Pre-slaughter Stress

Poultry-Breeding and Hatchery Symposium: Semen Evaluation and Fertility Determination in Poultry

978 Using sperm penetration values to evaluate broiler breeder performance and reproductive efficiency. R. K. Bramwell*, University of Arkansas, Fayetteville.

The sperm penetration assay is a technique developed to quantitatively assess sperm-egg binding and penetration of the perivitelline layer (PL) enveloping the ovum of the avian egg. The process of sperm-egg binding and penetration represents one of the final steps in fertilization sperm must accomplish in order access the female pronucleus for syngamy. Sperm penetration (SP) values have proven to be beneficial for both research and industry applications as these values are based on a sliding scale as opposed to a binary scale for fertility values. As a research tool, male and or female contribution to infertility can be for both research and industry applications as these values are based on a sliding scale as opposed to a binary scale for fertility values. As a research tool, male and or female contribution to infertility can be evaluated with much greater accuracy than using fertility values alone. As an industry tool, SP values are used to evaluate broiler breeder flocks experiencing poor hatchability. From identified broiler breeder flocks, each egg from a 50-egg sample is subjected to the SP assay. Holes in the PL overlying the germinal disc caused by sperm-egg binding and the subsequent acrosome reaction are counted and the values recorded in one of five groups (0-10, 11-30, 31-60, 61-100, over 100 holes). Data is expressed as a percentage of the egg samples that produced values in one of the five groups previously reported. For each age group of broiler breeder flocks, an ideal standard has been determined and each flock can be compared to that standard to determine their reproductive efficiency. From this data, the cause of poor performance can be determined and recommendations made to improve breeder flock performance.

Key Words: Sperm Penetration, Sperm-Egg Binding, Fertility

979 Advances in sperm cell biology stemming from the analysis of sperm mobility. D. Froman*, Oregon State University, Corvallis.

Sperm mobility is a quantitative trait discovered in the mid-1990s. The term sperm mobility denotes the net movement of a sperm cell population against resistance at body temperature. The trait was discovered after development of a test based upon sperm penetration of 6% (wt/vol) Accudenz from an overlaid sperm suspension. This test was proven to be simple, objective, and suitable for semen analysis in the field as well as the laboratory. When applied to populations of males, extreme variation was observed among males. Sperm mobility phenotype was independent of age. The relationship between in vitro sperm mobility and male fecundity warranted a systematic analysis. Sperm mobility was proven to be a primary determinant of fertility based upon competitive and non-competitive fertilization. In fact, fertility was a function of sperm mobility phenotype. Heritability (h²)