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 × 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 m^2/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

977 Neonatal Fc receptor mRNA expression in fetal pigs and in gastrointestinal tissues from pigs fed diets of varying form with or without irradiated and non-irradiated spay-dried animal plasma. C. N. Groesbeck*[1], T. E. Burkey[2], J. E. Minton[1], S. S. Dritz[1], R. D. Goodband[1], M. D Tokach[1], J. M. DeRouchey[1], and J. L. Nelssen[1], [1]*Kansas State University*, *Manhattan*, [2]*University of Nebraska*, *Lincoln*.

The neonatal Fc receptor (FcRn) participates in intracellular trafficking of IgG and the maintenance of circulating IgG. Also, the relationship between the FcRn and IgG may augment host defense immunosurveillance. The current studies evaluated FcRn mRNA from intestinal tissues in fetal pigs and weaned pigs fed meal or pelleted diets with or without irradiated or non-irradiated spray-dried animal plasma. In Exp. 1, fetal pigs were obtained at d 55 and d 70 of gestation (n = 5 fetuses/gestational age) and total RNA was isolated from intestinal tissues for quantitative real-time PCR (qPCR) to determine mRNA for FcRn. FcRn transcripts were observed in all samples, and greater levels of FcRn mRNA were observed in d 55 fetuses compared to d 70 fetuses (P < 0.02). In Exp. 2, weaned pigs were used in an 11-d growth assay to determine the effects of feeding meal and pelleted diets with irradiated or non-irradiated spray-dried animal plasma (AP 920) on FcRn expression in intestinal tissues. Pigs were blocked by weight and randomly allotted in a 2 × 2 factorial to one of four dietary treatments. Main effects were diet form (meal or pellet) and either irradiated or non-irradiated spray-dried animal plasma. Jejunal, ileal, and cecal tissues were collected from 24 pigs at the conclusion of the growth assay. Total RNA was isolated to quantify relative mRNA expression of FcRn. FcRn transcripts were again observed in all samples. FcRn mRNA was more abundant in pigs fed diets containing non-irradiated plasma compared with pigs fed the irradiated plasma (P < 0.02, 1.01 vs 0.57). FcRn mRNA was also more abundant in the pigs fed meal diets than pelleted diets (P < 0.05, 0.98 vs 0.59). The results suggest FcRn varies with gestational age in pigs and with factors affecting dietary bacterial load.

Key Words: FcRn Receptor, Irradiation, Pig

Poultry-Breeding and Hatchery Symposium: Semen Evaulation 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 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 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 (h^2)