

and 1-d egg weights were recorded weekly. Data were analyzed using ANOVA with starting BW as a covariate, and hybrids compared using Fisher's least significant difference ($P < 0.1$ considered significant). In the overall 14-wk period, egg production ranged from 77.1–84.5% and was up to 8.7% higher when Hybrid F was fed compared to A, C, D, or E ($P < 0.1$). Egg weights only differed among Hybrids B (60.7 g) and C (62.4 g) ($P < 0.1$). Egg mass (egg weight \times egg production) ranged from 47.3–51.9 g/d and was up to 7.7% higher when Hybrid F was fed compared to A or D ($P < 0.1$). Feed intake ranged from 96.7–102.0 g/d and was up to 5.2% higher when Hybrid F was fed compared to A, B, or D ($P < 0.1$). Egg specific gravity ranged from 1.069–1.073 and hens fed Hybrid F had the strongest eggshells compared to A, B, or D ($P < 0.1$). Feed utilization ranged from 484–513 g egg-mass/kg feed and was up to 5.6% higher when Hybrid F was fed compared to A or D ($P < 0.1$). The improved egg-production performance of hens fed Hybrid F; indicated by egg weight, egg mass, egg production, eggshell thickness, and feed utilization; correlated with smallest kernel size, second highest seed density, highest oil content, and midrange Lys and TSAA contents. Corn fiber content did not affect egg-production performance. These results demonstrate that corn kernel physical and chemical traits affect laying hen egg production performance.

Key Words: laying hen, corn hybrid, egg-production performance

109 Effect of fat and fiber inclusion in the diet on ileal and fecal utilization of nutrients in broiler chicks. J. M. González-Alvarado^{*1}, E. Jiménez-Moreno², A. González-Serrano², R. Lázaro², and G. G. Mateos², ¹Universidad Autónoma de Tlaxcala, México, ²Universidad Politécnica de Madrid, Spain.

We studied the effects of type of fat [vegetable oil mixture (VO) vs. yellow grease (YG)] and source of fiber in the diet [none vs. oat hulls (OH) vs. sugar beet pulp (SBP)] on apparent ileal digestibility (AID)

and total tract apparent retention (TTAR) of nutrients in broilers. One-d-old male chicks (Cobb-500) were randomly allotted to 36 cages (18 birds/cage) and six cages were assigned to each treatment. The control diets (VO or YG without fiber inclusion) contained 1.5% crude fiber and were based on rice, soy protein concentrate, fish meal, fat (5%), and sepiolite (3%). In the remaining diets the fiber source was included at the expenses of sepiolite (wt/wt). Average daily gain (ADG) and feed conversion ratio (F:G) were measured from 1 to 15 d of age. Also, AID of DM, CP, and starch (ST), TTAR of nitrogen (NR) and ether extract (EE), and AMEn of the diets were measured at 15 d of age using 2% celite as an indigestible marker. Fecal retention of N (70.9% vs. 68.8%, $P < 0.05$) and of EE (91.6% vs. 87.4%, $P < 0.001$), and AMEn (3,237 vs. 3,178 kcal/kg, $P < 0.001$) were higher for VO than for YG-based diets. However, type of fat did not affect AID of nutrients and had little effect on productive performance of broilers. The inclusion of a fiber source, either OH or SBP, tended to increase ADG (25.3 vs. 24.5 g/d, for the fiber diets and control diet, respectively; $P = 0.07$) and improved F:G (1.245 vs. 1.308; $P < 0.001$), TTAR of EE ($P < 0.05$), and AMEn ($P < 0.05$). Inclusion of SBP reduced AID of DM, CP, ST, and NR ($P < 0.05$) whereas the OH inclusion did not affect AID of nutrients. An interaction type of fat \times inclusion of fiber was observed; the beneficial effects of fiber on AMEn were more noticeable with YG than with VO ($P < 0.05$). The results indicate that type of fat and nature of the fiber influence nutrient utilization and that young broilers have a minimum requirement of insoluble fiber in the diet.

Key Words: nutrient digestibility, fat, crude fiber

Physiology, Endocrinology, and Reproduction: Reproduction

110 Transplantation of chicken ovaries: A breakthrough for germplasm conservation. Y. Song* and F. G. Silversides, *Agriculture and Agri-Food Canada, Agassiz, BC, Canada.*

Cryopreservation and transplantation of ovarian tissue is an effective method for conserving the female germline in rodents, but comparable techniques have not been available for birds. We recently developed a surgical technique for orthotopic transplantation of ovarian tissue in newly hatched chickens and demonstrated that the grafted tissue could attach and undergo development in the host. Normal ovarian function and the production of donor-derived offspring remained to be demonstrated. Twenty one day-old White Leghorn chicks were surgically transplanted with fresh ovarian tissue from day-old Barred Plymouth Rock chicks. Nine chicks were administered an immunosuppressant (100mg/kg CellCept[®]) after the surgery. All transplanted birds grew to sexual maturity but two of the immunosuppressed chicks underwent sex-reversal. Hens that had received the transplanted tissue were inseminated with semen from Barred Plymouth Rock roosters to determine the gametic origin of the offspring. Of the 12 hens in the non-immunosuppressed group, 9 have produced eggs. Of these 9 hens, 1 produced only black chicks originating from the

transplanted ovaries, 4 produced only white chicks from regenerated host ovaries, and one produced a mixture of black and white chicks. Eggs from the other 3 hens were fertile but all embryos died before pigment deposition. Six of the 7 hens in the immunosuppressed treatment produced eggs. Of the 6 hens, 1 produced only black chicks, 3 produced only white chicks, and 2 produced only embryos that died early in incubation. These results demonstrated that transplanted ovaries could produce normal eggs and give rise to donor-derived offspring, and provide a new approach to developing protocols for the cryopreservation of poultry stocks.

Key Words: chicken, ovary transplantation, germplasm conservation

111 Storage of turkey semen at 4°C for 24h alters the sperm glycolyx. J. Peláez and J. Long*, *Beltsville Agricultural Research Center, Beltsville, Maryland.*

The glycolyx, a carbohydrate-rich zone on the surface of all eukaryotic cells, represents the primary interface between the male gamete and its environment and is known to be involved with immunoprotection in the

female genital tract and early gamete interactions. We recently have characterized the types and distribution of sugar residues comprising the glycocalyx of poultry sperm. Our objective here was to determine the effects of semen storage on the turkey sperm glycocalyx from both high and low sperm mobility toms. Semen was collected from 3 high and 3 low mobility toms, pooled within mobility group and extended 1:1 with BPSE. Extended semen was maintained at 4°C with constant agitation for 24 h. At 0, 2, 4, 8, 12 and 24 h, semen aliquots were centrifuged (400g; 5min) to remove seminal plasma. Isolated sperm were either immediately stained with 1 of 14 FITC-conjugated lectins (100 µg/mL; 30min; 25°C; 100x10⁶ cells/mL; non-treated), or were neuraminidase-treated (30min; 37°C; 1 IU/10⁹ cells; n'ase-treated) followed by lectin staining. Samples were counterstained with propidium iodide and assessed by flow cytometry (n=6). For each lectin, differences in Mean Fluorescence Intensity (MnFI) of live cells were studied over time between mobility groups and sperm treatments. In non-treated sperm, the MnFI for 8/14 lectins increased (P<0.05) between 8 and 24 h of semen storage compared to 0h (8 h: Con A, GS-I, jacalin, RCA, sWGA; 12 h: GNA; 24h: PNA, lotus). The MnFI for WFA, ECA and GS-II were constant (P>0.05) over time in non-treated samples; however, in n'ase-treated sperm, MnFI increased after 8 h. The MnFI for SBA and PSA remained constant during semen storage, regardless of treatment (P>0.05). Sialic acid residues increased during storage suggesting that free sialic acid in the seminal plasma can be incorporated into the glycocalyx. Only 3 lectins (Con A, SBA and PSA) exhibited differential binding between mobility groups, with MnFI consistently higher (P<0.05) for low mobility sperm. These data demonstrate that the glycocalyx of turkey sperm is modified during storage and suggest that alterations in surface carbohydrates may adversely impact sperm function.

Key Words: turkey, sperm, glycocalyx

112 Procalcitonin gene expression in the chicken ovary: Influence of ovarian steroids. S. M. Krzyzik-Walker*, O. M. Ocón-Grove, S. Maddineni, G. L. Hendricks III, and R. Ramachandran, *The Pennsylvania State University, University Park.*

Calcitonin, a hormone primarily known for its role in calcium homeostasis, has recently been linked to reproduction, specifically as a marker for embryonic implantation in mammals. Furthermore, ovarian steroid hormones have been shown to alter the expression and secretion of calcitonin in both mammalian and non-mammalian species. However, production of calcitonin in the ovary has yet to be elucidated in any vertebrate species. The objective of the present study therefore was to determine if procalcitonin mRNA is present in the avian ovary, and if so, to ascertain how the expression may change with follicular maturation or steroidal influences. We hypothesized that procalcitonin mRNA is expressed by the ovarian granulosa cells, and its expression will be altered by follicular maturation, as well as treatment with estradiol and/or progesterone. Using RT-PCR, we detected procalcitonin mRNA in the total ovary, specifically in the granulosa cells of the F1 and F2-4 follicles. Further analysis with real-time quantitative PCR revealed that the F1 follicle had a significantly greater amount of procalcitonin mRNA (P<0.05) compared with F2-F6 follicles and total ovary. To determine the influence of ovarian steroids on procalcitonin mRNA expression, sexually immature Leghorn chickens (16 wk old; n=8) were injected with estradiol (E2) and/or progesterone (P4). Quantification of total ovarian procalcitonin mRNA revealed a significantly greater expression with P4 treatment (P<0.05), while E2 and E2+P4 treatments decreased mRNA levels (P<0.05)

compared to vehicle treated control chickens. Collectively, these findings indicate that follicular maturation and ovarian steroids influence procalcitonin gene expression in the granulosa cells of the chicken ovary. We thereby speculate that progesterone, secreted by the F1 follicle, is responsible for the increased procalcitonin mRNA levels.

Key Words: procalcitonin, ovary, chicken

113 Spontaneously occurring fibroid tumors of the laying hen oviduct. A. L. Doernte*¹, M. G. Conner², M. N. Barnes², S. H. Oates¹, and W. D. Berry¹, ¹*Auburn University, Auburn, Alabama,* ²*The University of Alabama, Birmingham.*

Spontaneously occurring benign uterine leiomyomas (fibroids) are the most common tumors of reproductive age women. It is estimated that more than 70% of all women have uterine fibroids and the presence of these tumors is a primary cause of hysterectomies. Research into the causes and treatment of uterine fibroids is hampered by a lack of reliable animal models for the disease. Leiomyomas that appear to be outwardly similar to human uterine fibroid tumors are known to occur on the oviducts of laying hens over two years of age. The objective was to characterize these tumors and compare them to human uterine fibroids for the purpose of determining the suitability of the aging hen as a model system for the study of the disease. In this study, hens at 5 years of age were examined for the presence of oviduct associated fibroid tumors. Tumors were found attached to the internal surface of the oviduct, embedded in the oviduct wall, or attached to the exterior of the magnum and isthmus. Tumor and normal oviduct samples were frozen or fixed in formalin for histological analysis including immunohistochemistry for a qualitative analysis of estrogen and progesterone receptors, PCNA, Bcl-2, TGF β-3, IGFBP-5, and IGF-2. Human uterine fibroid samples were acquired and evaluated as a comparison to hen oviduct fibroids. The results demonstrated that laying hen fibroid tumors are similar to human fibroid tumors with respect to estrogen and progesterone receptors, localized cellular proliferation, and expression of the latter proteins.

Key Words: fibroid, avian model, immunohistochemistry

114 The effect of dietary supplementation of L-carnitine on reproductive traits of White Leghorns. W. Zhai*¹, S. L. Neuman², M. A. Latour¹, and P. Y. Hester¹, ¹*Purdue University, West Lafayette, Indiana,* ²*Guidant Corporation, St. Paul, Minnesota.*

Previous work in our lab has shown that the inclusion of 125 ppm of carnitine into diets of roosters increased sperm concentration. The objective of the current experiment was to determine if the increase in sperm concentration observed in roosters consuming carnitine would culminate in improved hatch rates. Diets formulated to contain 0 and 125 ppm of carnitine were fed to male and female birds beginning at hatch until 37 wk of age. Feed analysis showed carnitine levels at 1 and 143 ppm for control and supplemented diets, respectively. Eighty-four roosters were used with the semen of 2 roosters comprising an experimental unit. Using a 2 × 2 factorial arrangement, pools of semen from either control or carnitine supplemented roosters were artificially inseminated to each of 288 hens with 23.5 µL of semen weekly resulting in a mean insemination dose of 1.2 and 1.1 × 10⁸ sperm/hen for carnitine and control hens, respectively. Data were analyzed using ANOVA with repeated measurements using the mixed

model procedure of SAS. Dietary carnitine as compared to control diets improved sperm concentration (5.3 and 4.8×10^9 sperm/mL, SEM = 0.1, $P = 0.002$), increased egg yolk carnitine concentration (16.3 and 12.7 nanomoles, SEM = 0.3, $P = 0.001$), decreased yolk weights (3.2 and 3.7 g, SEM = 0.1, $P = 0.0001$) at hatch, but had no effect on semen volume (0.49 and 0.50 mL SEM = 0.02, $P = 0.87$), and hatch of fertile (90% and 91% , SEM = 1, $P = 0.47$), respectively. It is concluded that supplementation of diets with L-carnitine improved the yolk carnitine concentration, decreased the yolk weight and improved sperm concentration, but did not result in a subsequent improvement in hatch rate most likely due to the high numbers of sperm that were inseminated in both the control and carnitine fed hens.

Key Words: carnitine, semen, hatch

115 Broiler parent flock age influences embryonic metabolism.

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This study examined the effect of broiler genetic strain (Ross 308 (R); Cobb 500 (C)) and parent flock age on eggshell conductance (G), and embryonic metabolism. The G on thirty hatching eggs from young (Y) (R and C=29 wk), peak (P) (R=34 wk; C=36 wk), and post-peak (PP) (R and C=40 wk) flocks were calculated, then these eggs broken open to establish wet (W) and dry (D) yolk, albumen and shell content. Twenty eggs from the same flocks were weighed then incubated for 21.5 d in individual metabolic chambers. During incubation, O_2 consumption, CO_2 output and eggshell temperature were measured. Metabolic heat production (H) was calculated. Hatched chicks were euthanized, yolk sacs removed, and wet and dry yolk sac and carcass weights recorded. The data were analyzed using SAS® GLM with $P \leq 0.05$. Strain and flock age did not affect G. Wet and dry yolk, albumen, and eggshell percents were not affected by strain. Wet and dry yolk fraction were higher in P (W=29.9±0.4%; D=15.3±0.3%) and PP (W=30.9±0.4%; D=15.5±0.3%) than Y eggs (W=25.8±0.4%; D=14.2±0.3%). But wet and dry shell contents were higher in PP (W=9.0±0.1%; D=8.9±0.1%) versus Y (W=8.7±0.1%; D=8.6±0.1%) and P (8.7±0.1%; D=8.5±0.1%) while wet albumen content was higher in Y (61.7±0.4%) than P (56.5±0.5%) and PP (55.4±0.4%) eggs. Strain did not affect O_2 consumption CO_2 output, eggshell temperature or heat output. Embryos from Y produced more heat (88.3 ± 1.9 mW) and consumed more O_2 (915.6 ± 19.4 ppm) than embryos from P (H=74.4±2.1 mW; $O_2=818.5 \pm 20.7$ ppm) or PP flocks (H=75.9±1.7 mW; $O_2=769.5 \pm 18.3$ ppm). Output of CO_2 was higher in Y (529.5 ± 12.2 ppm) or P (561.7 ± 12.6 ppm) embryos than PP (522.3 ± 11.9 ppm) embryos but Y and PP were not different. Chick weights were heavier in R (48.4 ± 0.2 g) than C (47.2 ± 0.2 g). Wet and dry yolk sacs were heavier in PP (W=8.7±0.2g; D=4.8±0.1g) than Y (W=8.1±0.2g; D=4.1±0.1g) or P (W=8.3±0.2g; D=4.4±0.1g) chicks but Y and P wet yolk sacs did not differ. These results show that embryo metabolism was affected by flock age but not strain. Future trials should be aimed at examining embryos from older flocks and different breeder strains.

Key Words: broiler genetic strain incubation, eggshell conductance, embryo metabolism

116 Expression of the mRNA for zona pellucida proteins A, B2, and X in two genetic lines of turkey hens that differ in fertility. A. P. Benson*¹, V. L. Christensen², B. D. Fairchild¹, and A. J. Davis¹, ¹University of Georgia, Athens, ²North Carolina State University, Raleigh.

The freshly ovulated ovum in avian species is surrounded by a protein layer called the inner perivitelline layer (IPVL), which is equivalent to the zona pellucida in mammals. For successful fertilization, sperm must attach to and penetrate the IPVL. The IPVL contains the zona pellucida family of proteins and members of this family have been shown to possess sperm binding activity and to stimulate sperm penetration of the zona pellucida. In the domestic chicken six distinct zona pellucida genes have been characterized (ZPA, ZPB1, ZPB2, ZPC, ZPD and ZPX). Previously our laboratory characterized the mRNA expression of ZPB1, ZPC, and ZPD by Northern blot analysis in two lines of turkey hens selected for over 40 generations for either increased egg production (E) or increased body weight (F). In the present research, the expression of the mRNA for ZPA, ZPB2, and ZPX was investigated in these two lines of turkey hens.

Individual granulosa layers were isolated from the F₁ to F₄ follicles of 648-wk old hens from each genetic line. In addition, a 1 cm² section of the granulosa layer around the germinal disc (GD) and a nongerminal disc (NGD) area of the F₁ and F₂ follicles was isolated from 12 hens from each line. Total RNA was extracted and DNase treated for two step real-time PCR analyses of ZPA, ZPB2, and ZPX. Taqman minor groove-binding probes and primers for detecting ZPA, ZPB2, ZPX, and GAPDH (endogenous control) were designed with Primer Express based on turkey cDNA sequences for these 4 genes. Expression of ZPA, ZPB2, and ZPX was detected in all follicle sizes. No significant differences in ZPA and ZPX mRNA expression were detected between the GD and NGD areas. However, the expression of the mRNA for ZPB2 was significantly greater in the GD area when compared to the NGD area in F₁ and F₂ follicles from both E line and F line hens. The results suggest that higher expression of ZPB2 in the germinal disc area may be important for the preferential binding of sperm to this region of the IPVL.

Key Words: zona pellucida proteins, turkeys, fertility

117 Effect of season, hatch time, and post-hatch holding on glycogen status of turkey poults. J. D. Warner*¹, P. R. Ferket¹, V. L. Christensen¹, and J. V. Felts², ¹North Carolina State University, Raleigh, ²Goldsboro Milling Company, Goldsboro, North Carolina.

Post-hatch survival and development of poults is dependent upon their glycogen reserves. The effects of season and hatch time on the glycogen status of neonatal turkey poults and subsequent recovery of glycogen reserves were studied in three commercial North Carolina hatcheries. During summer (September) and the following winter (February), poults were identified by color marker on their heads as hatched at 636, 648, 660, and 672 h of incubation. At 672 h (hatch pull), fifteen poults from each hatch time were randomly selected, euthanized by CO_2 , and chilled on ice. Tissue (whole breast muscle, pipping muscle and liver) was collected and frozen for later analysis. Another 15 poult sample hatched at the aforementioned times was processed and held for 24 h prior to similar tissue sampling. Ten embryos from each hatchery were also sampled at 600 h of incubation

to serve as a reference point for this study. All tissue samples were weighed and sub-sampled for glycogen analysis. Liver glycogen (3.1 mg/g liver or 2.8 mg total) and breast glycogen (2.3 mg/g, 3.7 mg total) were 2 and 1.2 times higher, respectively, in the winter than in the summer ($P < 0.0001$). Only during the winter did hatch time affect glycogen status. Total glycogen levels in liver and breast were 3.4 and 1.3 times higher, respectively, among poult hatched at 648 h than those hatched at 636, 660 or 672 h. Post-hatch holding played a significant role in the recovery of glycogen in breast muscle in winter and in liver glycogen in summer, however total breast glycogen decreased 1.35 fold during the holding period in the summer. These results demonstrate that hatch time and season influence glycogen reserves, possibly affecting early poult survival.

Key Words: turkeys, hatch time, glycogen

118 Incubation temperature and eggshell conductance effects on the intestinal maturation and thyroid function in commercial turkey poult hatching from a first cycle flock. S. L. Funderburk^{*1}, V. L. Christensen¹, G. G. Campbell², M. J. Wineland¹, J. L. Grimes¹, K. M. Mann¹, E. R. Neely¹, D. T. Ort¹, D. V. Rives², and J. P. McMurtry³, ¹North Carolina State University, Raleigh, ²Prestage Farms, Clinton, North Carolina, ³USDA-ARS, Beltsville, Maryland.

Eggshell conductance (G) and egg weight (EW) affect poult viability. Poor livability may be related intestinal maturation and thyroid function of the neonate. The objectives of this study were to test if incubator temperature and G determine poult maturity among egg from a young turkey flock. Maturation was assessed by measuring body weight (BW), feed per gain, jejunum maltase (M) and alkaline phosphatase (ALP) activities and thyroid function of commercial turkey poults. Eggs from a first cycle flock (new), mean EW 83.47 g, were weighed, numbered, set and incubated under standard operating procedures in a commercial turkey hatchery. Eggs were incubated under a high temperature profile (HP) and under a low temperature profile (LP). All eggs were reweighed at 25 d and G was calculated. The eggs were then sorted into three groups: high, average, and low G. At hatch poults were identified by G group and incubation profile. Poults from each experimental group was placed in battery brooders and grown for 7d and BW and feed consumption were measured at days 1, 3, 7. At days 1 and 3 posthatching blood and intestinal samples were taken from each G group and incubation profile. Data were analyzed using the GLM procedure of SAS. LP poults showed greater total jejunal M, T4 and BW, but decreased gain than HP poults. High and average G poults showed higher M, BW and gain compared to low G poults. Average G males possessed the highest amount of T3, while the average G females had the lowest amount of T3. Females had a heavier jejunum

relative to body weight than the males as well as a higher feed per gain value. Incubation profile interacted with G to affect poult M, ALP and thyroid activities among poults from a new flock. Thus, as flock age changes incubation profile and G are tools that may be managed to improve poult maturity.

Key Words: conductance, maltase, thyroid

119 Incubation temperature and eggshell conductance effects on intestinal maturation and thyroid function in commercial turkey poult hatching from an induced molted flock. S. L. Funderburk^{*1}, V. L. Christensen¹, G. G. Campbell^{2,1}, M. J. Wineland¹, J. L. Grimes¹, K. M. Mann¹, E. R. Neely¹, D. T. Ort¹, D. V. Rives², and J. P. McMurtry³, ¹North Carolina State University, Raleigh, ²Prestage Farms, Clinton, North Carolina, ³USDA-ARS, Beltsville, Maryland.

Eggshell conductance (G) and egg weight (EW) affect poult livability. Poor viability may be related to intestinal maturation and thyroid function of the neonate. The objectives of this study were to test if incubator temperature and G determine poult maturity. Maturation was assessed by measuring body weight (BW), feed per gain, jejunal maltase (M), alkaline phosphatase (ALP) and thyroid function of commercial turkey poults. Eggs from an induced molted flock (recycled), mean EW of 92.55 g, were weighed, numbered, set and incubated under standard operating procedures in a commercial turkey hatchery. Eggs were incubated using a high temperature profile (HP) and a low temperature profile (LP). All eggs were reweighed at 25 d and G was calculated. The eggs were then sorted into three groups: high, average, and low G. At hatch poults were identified by G group and incubation profile. Poults from each experimental group were placed in battery brooders and grown for 7 d and BW and feed consumption were measured at days 1, 3, and 7. At days 1 and 3 posthatching blood and intestinal samples were taken from each G group and incubation profile. Data were analyzed using the GLM procedure of SAS. Poults incubated under the HP showed increased jejuna weight, M, ALP and T3:T4 compared to LP poults. High and average G poults showed greater jejuna ALP, BW gain and decreased feed per gain compared to L G poults. Males incubated at HP with high G had higher M than average and low G males at HP. Females incubated at HP with an average and low G had greater M than high G females at HP. The greatest BW can be seen among HP males with average G and HP females with high G. Incubation profile interacted with G to affect M, ALP and thyroid activities among poults from a recycled flock. Thus, incubation profile and G may be managed to improve poult maturity.

Key Words: conductance, maltase, thyroid

Processing, Products, and Food Safety: Processing and Products

120 Modeling broiler growth with Neural Networks using simulated data. H. A. Ahmad^{*}, T. Habtemariam, B. Tameru, D. Nganwa, L. Ayanwale, and G. Beyene, *Tuskegee University, Tuskegee, Alabama.*

Broiler growth modeling is usually done using average body weight data over certain periods of time for specific strain of birds under given management conditions. Such growth curve data are then analyzed for its underlying distribution and for predictions either with mathematical

models, like Gompertz or nonlinear statistical models that fits the data best. Constant selection in genetic pool, nutritional factors and environmental concerns however, make such models limited in their utility due to difficulty in fitting the growth curve across time, bird-strain and other determining variables. Moreover, generating data for every strain of birds under continually changing variables is not a feasible approach. The current model addresses two objectives: using simulation techniques to generate growth data, using published literature, on broilers for different growth periods; and use of artificial intelligence techniques rather mathematical-statistical approaches