
The Annual Extension Special Recognition Award acknowledges extra effort of Extension Personnel in national programs. The 2002 award is presented to Glenn Carpenter, currently with the USDA Natural Resources Conservation Service. Jim Rock (CT, retired) continues to provide the workshop evaluation. Publication of the Poultry Science Resource List is now through the Poultry Science Association. Please inform PSA Board of Directors if you appreciate this effort. The National Poultry Infobase continues to languish due to insufficient enthusiasm by poultry system personnel. Faculty members, industry or government personnel must step forward at this time. See Nick Zimmermann (MD) for details.

Texas (John Carey, Chair) will host the 2004 Southern Region Poultry Extension Workshop, which now represents all Extension regions. Get program format, speaker or topic ideas to John. The 2002 National Poultry Waste Management Symposium will be held October 28-30 in Birmingham, AL. This is my last year as Coordinator. A transition team will transfer responsibilities to LGU personnel; with Mike Hulet, the 2004 Coordinator.

My responsibilities continue to change with the increasing importance of animal well-being and environmental issues. I am Co-Coordinator of the National Swine Housing and Well-Being Symposium, and education project. Department reviews, and liaison responsibilities to research committees, are important functions. Opportunities and change occur at an accelerating rate. We continue to develop and implement innovative programs based on relevance to animal agriculture and societal requirements. Anyone wishing to be part of program planning and development is welcome.

Key Words: Extension Recognition Award, PSA Resource List, National Poultry Infobase, Poultry Extension Workshop, Waste Management Symposium

Environmental & Management

10 The impact of live yeast culture on the suppression of aflatoxicosis in broiler breeder hens. V.G. Stanley1, M. Winsman1, T. Ogusley1, C. Gray1, W.F. Krueger2, and A.E. Sefton3. 1Prairie View A&M University, 2Texas A&M University, 3Alltech, Guelph.

A study was conducted to examine the effect of live yeast culture [(LYC) (Yea-SaccTM Alltech, Inc., Nicholasville, KY)] on suppressing aflatoxicosis in breeder breeder hens. Ninety six Cobb broiler breeder hens, at 32 wk of age, of the same strain, were fed diets amended with aflatoxin (0 and 3 mg/kg) and LYC (0 and 2 lb/ton) singly and combined. The birds were housed at random, 12 females, 1 male per pen with two pens per treatment group. Eggs were collected daily, stored at room temperature and incubated every 7 d for 3 wk. Response variables analyzed were percent fertility, hatchability, hen day production, egg weight, chick weight at hatch, and embryonic mortality. The data showed that aflatoxin had no significant effect on percent fertility, egg size and chick weight at hatch. However, hen day egg production, percent hatchability, and embryonic mortality were significantly (P<0.05) affected by aflatoxin. The inclusion of LYC reversed the severity of aflatoxin, raising the level of hatchability and egg production to the level of the control. Egg production decreased significantly after wk 1 with the ingestion of aflatoxin. Hatchability of fertile eggs collected from the aflatoxin-fed hens for wk 1, 2, and 3 were 87.5, 76.6 and 48.3%, respectively, compared to 72.2; 72.0, and 68% for the control. Egg production and hatchability of fertile eggs improved significantly (P<0.05) with the inclusion of LYC (89; 83; 82%) compared to 72.2, 70, 68% for the control. The effect of aflatoxin on hatchability was neutralized by LYC raising the level from 48.3% to 80% after wk 2 feeding with the toxin. In conclusion, the data demonstrate that aflatoxin has significant effect on hatchability of fertile eggs, and egg production which can be reversed by the dietary inclusion of the LYC.

Key Words: Broiler breeder, Allzyme, Revertive yeast culture

11 The effect of dietary energy and enzyme supplementation on growth and dry matter retention in broiler breeders. M.S. Liburn1, S. Rao2, and E.E.M. Pierson3. 1The Ohio State University, 2Tyson Foods, 3Finnfeeds International.

Commercial broiler breeders (Cobb) were fed one of three pullet grower diets from 14 d to 22 weeks with or without supplemental AVIZYME 1502 #. The experimental diets contained 1215, 1240, or 1275 kcal and the same feed restriction schedule was used for all treatments. Pullets were weighed by pen weekly and individually weighed at 4 wk intervals. Pullets fed the 1275 kcal diet were significantly heavier beginning at 8 wk and pullets fed the 1275 kcal diet plus AVIZYME were heavier at 12 wk resulting in a significant dietary energy × enzyme interaction. From 12 to 22 wk, the weekly feed allocation for pullets in the 1275 kcal plus enzyme treatment was marginally reduced compared with the other treatment combinations. This resulted in similar BW among all treatments at 22 wk but a 0.5 lb reduction in cumulative feed per pullet from 12 to 22 wk for those hens in the 1275 kcal plus enzyme treatment. At 20 wk, 8 pullets per diet and enzyme combination were randomly assigned to 48 individual battery pens in a Petersime growing battery. Hens were still on alternate day feeding (160 g per bird) so after feeding, total excreta was collected for the ensuing 48 h. This was repeated 4 times. Dry matter retention was 70.6% for the two lowest energy treatments with or without enzyme and this increased to 72.4% for the 1275 kcal dietary treatment alone and 73.7% for the 1275 kcal diet plus AVIZYME. This supports the BW data and cumulative feed savings associated with the high energy plus supplemental enzyme treatment.

Key Words: Broiler breeders, AVIZYME, Restriction

12 Influence of peak and post-peak feed allotments on broiler breeder egg production. R.J. Lien*, J.B. Hess, and W.D. Berry, Auburn University, Auburn, AL USA.

To determine effects on egg production, feed allotments of breeder hens were increased at different rates from photostimulation (PS) to peak production, so as to reach high and low peak feed allotments, and then decreased at similar rates. A total of 800 Cobb 500 strain hens were reared on a photostimulated schedule of 8h L:16h D and then subjected to PS with 15h L:9h D from 21 to 65 wk. Daily allotments of a 16% CP, 2800 kcal ME/kg, and 3.0% Ca feed were provided to both treatments from 23 to 65 wk. Feed allotments of 96.7 g/ hen/day provided during wk 21 were increased weekly to reach levels of either 164.3 (high) or 153.5 (low) g/hen/day, which were provided from 29 to 32 wk. From 32 to 34 wk allotments were decreased to 155.3 and 146.6 g/hen/day in the high and low treatments, respectively. Allotments in both treatments were then decreased at a rate of 0.9 g/hen/day on a weekly basis to reach either 126.2 (high) or 117.6 (low) g/hen/day at 65 wk. Therefore, feed allotments were reduced by 23.2 and 23.4% from peak to termination in the high and low treatments, respectively. At 21 wk, mean BW of both treatments was 2.08 kg. At 25 wk BW still did not differ. At 30 and 65 wk, the BW of the high treatment were 0.11 and 0.19 kg greater than the low treatment. Uniformities did not differ at 21, 25 or 30 wk. Fat pad, ovaries and oviduct weights were greater in the high treatment at 30 wk; however, breast weights, and body fat and CP percentages did not differ at this time. Age at onset of lay did not differ between treatments. Total production at 65 wk was 155 and 142 eggs/hen in the high and low treatments, respectively. From 25 to 35 and from 36 to 45 wk, egg production/hen did not differ between treatments. However, from 46 to 55 and from 56 to 65 wk, egg production/hen in the low treatment was reduced relative to the high treatment by approximately 3 and 6 eggs, respectively. Egg weights and specific gravities did not differ between treatments throughout the study. Greater feed allotments provided to breeder hens during the peak and post-peak production periods had relatively slight effects on BW but resulted in greater late cycle and total egg production in this study.

Key Words: Broiler breeder, Egg production, Peak feed allotments, Feeding program
13 Phytase supplementation for rearing and production of heavy strain broiler breeders. Haitao Li1, Wallace D. Berry, Joseph B. Hess, Roger J. Lien, David A. Roland, and Suzanne Oates, Department of Poultry Science, Auburn University.

Little information is available about whether phytase can be used to replace phosphorus in rearing and production diets of heavy strain breeder replacements and pullets and hens. The objective of this study was to quantify the effects of dietary phytase on growth and livability of pullets during the rearing phase and their subsequent production performance during the entire breeder period. 1000 day-old female breeder chickens were placed in 4 pens with 250 birds each receiving 2 dietary treatments with 2 pens each treatment in a litter floored light proof pullet house. Male chicks were castrated surgically. Control pullets received a diet with 0.35% AP added inorganic phosphorus. Phytase treated pullets received a diet with 0.25% AP, supplemented with 300 U/kg phytase. At 22 weeks of age, 800 pullets were allocated to 8 pens in a curtain sided, slat litter breeder house. There were 100 hens per pen. Four pens each received either a control diet containing 0.3% AP without phytase or a phytase diet containing 0.1% AP supplemented with 300U/kg phytase. In the rearing period (from 0 to 25 weeks of age), the mortality of the phytase treated group was significantly lower than the control group. There was no significant difference in body weight or weight uniformity between control and phytase treatment groups. Every 4 weeks, 40 birds from each treatment were measured for shank and keel length and 4 birds from each treatment were killed for measurement of digestive tract length including large intestine & ceca, small intestine, pancreas and gizzard. Blood samples were taken from 40 hens in each treatment to determine plasma total protein, calcium and phosphorous. Litter samples were taken for determination of litter phosphorus. From 25 to 65 weeks, egg production, egg weight, shell weight, egg specific gravity, fertility, hatchability and body weight of day old chicks will be determined. From 26 to 40 weeks of age, the egg production of phytase treated group was 0.55% higher than the control group. There was no significant differences between phytase treated and control groups in egg weight and egg shell weight. There was no significant difference between the phytase treated group and control group egg specific gravity. The average hatchability of the phytase treated group was 2% higher than the control group.

Key Words: Breeder, Phytase, Phosphorus, Fertility, Hatchability

14 The influence of rearing day-length and diet density on body weight of 6 wk-old broiler breeders. A. M. Griffin1, F. E. Robinson1, R. A. Renema1, D. R. Korver1, and M. J. Zuidhof2, 1University of Alberta, 2Alberta Agriculture Food and Rural Development.

Feed restriction programs for rearing broiler breeders (BB) begin with a period of ad libitum feeding. Typically this period lasts 3 wk, with the photoperiod (P) being 8L:16D. It is not well known how much voluntary feed consumption is limited by an 8 h day. The objectives of this study were to determine the response of full-fed BB males and females to 4, 8, 12, or 16 h day lengths. Parameters measured included BW, carcass characteristics and body weight (BW) uniformity. This study used 800 male and 800 female Ross 308 breeders (reared as BB). Birds were housed in 32 floor pens. Four day lengths (4, 8, 12 and 16 h) and two ad libitum feeding programs were used: broiler program [start [wk 0-3, ME: 3010 kcal/kg, 24.0 % CP]] and grower [wk 3-6, ME: 3175 kcal/kg, 22.1 % CP] and BB program [start [wk 0-3 ME: 2750 kcal/kg, 20.0 % CP] and grower [wk 3-6, ME: 2750 kcal/kg, 18.0 % CP]]. Chick BW and feed consumption were recorded at 7 intervals to 42 d. On d 42, the 10 birds per pen closest to the mean BW were studied for carcass traits (shank length, chest girth and width, and keel length) as well as internal traits (breast muscle and fat pad weight). Uniformity in BW was recorded in the 42-d BW curve, low BW (LOW) pullets were 15 % lighter than STD, and high BW (HIGH) pullets were 15 % heavier than STD. Weekly measurements of thoracic circumference, thoracic width, shank and keel length were taken. At 22 wk of age the photoperiod was increased from 8L:16D to 15L:9D (PS). Carcass traits and ovarian morphology were determined after birds were killed at first oviposition. Plasma estradiol-17β (E2) and lipid concentrations were determined from weekly blood samples (n = 36 birds). Comb measurements (length, height, and area) were assessed from digital images. Age at SM was affected by BW treatment ( LOW = 190.1 d, STD = 186.4 d, and HIGH = 182.4 d). Weight at SM was directly related to BW treatment (LOW = 2920 g, STD = 3105 g, and HIGH = 3304 g). Pullets in the LOW BW group had significantly lower breast muscle weights, shank and keel lengths, thoracic circumference, and thoracic width measurements, compared to pullets in the HIGH BW group. The HIGH BW group had elevated E2 concentrations at 20 wk of age (HIGH = 29.6 pg / mL, STD = 20.6 pg / mL, and LOW = 14.5 pg / mL) suggesting advancement of ovarian development. Plasma E2 was < 30 pg / mL before PS and rose between 70 and 90 pg / mL 1 wk after PS. Female breeders in the LOW BW group had 6.89 large yellow follicles (LYF) at SM compared to 7.58 LYF in the HIGH BW group. Hens in the HIGH BW group had 42.9 % of LYF in multiple sets indicating a higher unsaturated egg production in these birds, compared to STD (33.5 %) and LOW (29.5 %) birds. Smaller conformation (fleshy content and frame size) suggests that LOW BW birds did not achieve the chronological age required for SM compared to STD or HIGH BW birds.

Key Words: Breeder, Sexual maturation, Ovarian morphology, Carcass size, Fleshing

15 Sexual maturation of broiler breeder pullets varying in body weight. S. I. Boersma1, F. E. Robinson1, R. A. Renema1, and M. J. Zuidhof2, 1University of Alberta, 2 Agriculture, Food and Rural Development.

Attainment of a threshold body weight (BW) is a requirement for sexual maturity (SM) in broiler breeders. Hence, uniformity in age at SM is affected by variation in individual bird BW. The extent of fleshing, carcass frame size, and BW are to be considered in the timing of pho- tostimulation (PS). The objective of this project was to determine how BW influences the timing of pullet SM and carcass composition at that time. A total of 242 Arbor Acres Classic (Aviagen) pullets were selected based on 18-wk BW and individually caged. Pullets were fed according to three BW targets. Standard (STD) pullets were fed using a target BW curve, low BW (LOW) pullets were 15 % lighter than STD, and high BW (HIGH) pullets were 15 % heavier than STD. Weekly measurements of thoracic circumference, thoracic width, shank and keel length were taken. At 22 wk of age the photoperiod was increased from 8L:16D to 15L:9D (PS). Carcass traits and ovarian morphology were determined after birds were killed at first oviposition. Plasma estradiol-17β (E2) and lipid concentrations were determined from weekly blood samples (n = 36 birds). Comb measurements (length, height, and area) were assessed from digital images. Age at SM was affected by BW treatment ( LOW = 190.1 d, STD = 186.4 d, and HIGH = 182.4 d). Weight at SM was directly related to BW treatment (LOW = 2920 g, STD = 3105 g, and HIGH = 3304 g). Pullets in the LOW BW group had significantly lower breast muscle weights, shank and keel lengths, thoracic circumference, and thoracic width measurements, compared to pullets in the HIGH BW group. The HIGH BW group had elevated E2 concentrations at 20 wk of age (HIGH = 29.6 pg / mL, STD = 20.6 pg / mL, and LOW = 14.5 pg / mL) suggesting advancement of ovarian development. Plasma E2 was < 30 pg / mL before PS and rose between 70 and 90 pg / mL 1 wk after PS. Female breeders in the LOW BW group had 6.89 large yellow follicles (LYF) at SM compared to 7.58 LYF in the HIGH BW group. Hens in the HIGH BW group had 42.9 % of LYF in multiple sets indicating a higher unsaturated egg production in these birds, compared to STD (33.5 %) and LOW (29.5 %) birds. Smaller conformation (fleshy content and frame size) suggests that LOW BW birds did not achieve the chronological age required for SM compared to STD or HIGH BW birds.

Key Words: Broiler breeders, Feed consumption, Carcass composition, Body weight uniformity

16 The effect of electrostatic space charge system in reducing dust and microorganisms during the lay cycle of broiler breeders. Richardson1, C. L. Hofacre1, and J. L. Wilson1, 1University of Georgia, Department of Poultry Science, 2USDA, ARS, Southeast Poultry Research Laboratory, 3University of Georgia, Department of Avian Medicine.

Broiler breeders begin their laying cycle at 20-22 weeks of age and are in production to at least 65 weeks of age. During this time, dust accumulates on walls and equipment and airborne dust levels increase. Since, microorganisms in general are carried by dust particles, this provides an excellent vector for horizontal disease transmission between birds. Airborne dust has also been closely correlated to ammonia levels, suggesting dust reduction should reduce ammonia emissions. Two environmentally controlled rooms containing broiler breeders (n=308 females/room, 33 males/room) were used to evaluate the effectiveness of an electrostatic space charge system (ESCS) in reducing airborne dust and microorganism levels. The control and ESCS treated rooms were each equipped with two ceiling fans for air mixing. The ventilation rate was kept equal between the two rooms throughout the study. A 252 pin, 6-bar ionizer unit was placed below each of two circulating fans in the middle of the treatment room. The ESCS in the treatment room was designed to reduce airborne dust and bacteria by inducing a strong negative electrostatic charge on airborne particulates as they circulate past the ceiling fan and to collect most of them on the grounded litter as air is directed there by the ceiling fans. Dust and ammonia concentrations in each room were logged at 10-minute intervals and airborne bacteria levels were measured using media plates (Blood, MACConkey, XLT4) exposed to the air.

Key Words: Electrostatic space charge system, Dust, Microorganisms, Airborne dust and bacteria, Air mixing, Ceiling fans, Laying cycle, Broiler breeders.
Airborne dust and ammonia levels were reduced by an average of approximately 50% compared to the control room. The use of the ESCS resulted in up to a 7-fold reduction in overall bacteria and up to a 65% reduction in gram-negative bacteria when compared to the control room. The reductions of airborne dust and bacteria in this study are comparable to earlier results obtained with the ESCS in experimental broiler breeder pullet rearing rooms, but lower than those obtained in commercial hatching cabinets or in an experimental caged layer room.

Key Words: Electrostatic space charge system, Broiler breeder hens, Dust, Bacteria, Ammonia.

17 Hatching egg, incubation, and chick characteristics from divergent source meat-type breeder hens mated to a common source male. N. S. Joseph1,†, E. T. Moran1, and D. A. Emmerson1, 1Auburn University, Auburn, AL, 2Aviagen North America, Huntsville, AL.

Commercial incubation has little latitude to accommodate egg variation. Egg differences attributable to hen source could affect embryonic development, chick recovery, and their subsequent performance. The present study characterized eggs, incubation losses, and resultant chicks from three breeder flocks (ca. 41 wk of age) with a common male and diverse hens (Strain A, 41%; Strain B, 45%; and Strain C, 14%) that could yield progeny differing in live performance and breast meat yield. A total of 720 eggs per strain cross were used. Eggs examined prior to incubation (60 per strain) differed in average weight such that Strain B produced larger eggs than Strains A and C (P<0.001). Separation of effects due to egg weight from those attributed to the dam was estimated using an analysis of covariance. ANCOVA indicated that Strains A and C provided a greater amount of yolk to the whole egg at the expense of the shell. Remaining eggs (660 per strain) were placed in a single-stage incubator. Fertility was 98% and distribution of dead germs was similar, regardless of hen source. Viable chicks removed from the hatchet approximated 2-d post-emergence and were in similar proportions among sources. At this time, differences in chick BW with sex were evident (39 vs 41 g for females and males, respectively) whereby, the averages with hen source were not. Yolk sac, liver, and skinless bone-in breast meat removed from ten chicks of each sex by strain cross were of similar proportions (yolk sac: 6.9%, liver: 2.9%, breast: 4.6%). Performance of remaining chicks 9-d post-hatch showed a separation in BW among the strains. Although birds from Strains A and B were heavier than Strain C, their proportion of skinless bone-in breast was not affected by hen source. Liver was proportionately less with Strain B birds than A and C. Effects due to egg weight per se are most influential early and dissipate thereafter; whereas those that can be attributed to the hen are minimal early and develop subsequently.

Key Words: Broiler, Strain, Incubation, Hatchability, Chick characteristics

18 Relationship of sperm mobility and testes characteristics in broiler breeder males. E.R. Bowling1,†, D.P. Froman2, J.L. Wilson1, and L.J. Richardson1, 1Department of Poultry Science, The University of Georgia, Athens, GA, 2Department of Animal Science, Oregon State University, Corvallis, OR.

Sperm mobility phenotype was determined for males within a broiler strain cross were of similar proportions (yolk sac: 6.9%, liver: 2.9%, breast: 4.6%). Performance of remaining chicks 9-d post-hatch showed a separation in BW among the strains. Although birds from Strains A and B were heavier than Strain C, their proportion of skinless bone-in breast was not affected by hen source. Liver was proportionately less with Strain B birds than A and C. Effects due to egg weight per se are most influential early and dissipate thereafter; whereas those that can be attributed to the hen are minimal early and develop subsequently.

Key Words: Broiler, Strain, Incubation, Hatchability, Chick characteristics

19 Impact of male-male competition and morphological traits on reproductive behavior in broiler breeders. B. Bilcik*, I. Estevez, and M. R. Luque, University of Maryland, College Park, Maryland.

The domestic fowl have very complex interrelated social and reproductive behaviors. Dominant birds are likely to have higher mating frequency, larger symmetrical secondary sexual characters and high semen quality, thus improving their reproductive success compared to subordinates. We hypothesized that within a group of broiler breeders, males with large, symmetrical secondary sexual traits would have the highest mating frequency. We also predict that mating frequency in groups with high male-male competition will increase in order to out compete the sperm from male group members. Twenty five wk old broiler breeders were kept in floor pens containing 10 females and either 1 (1M) or 3 males (3M) (3 rep/group). Birds were fed restricted and managed following commercial practices on a 16.5L:7.5D light cycle. The behavior of all groups was recorded from 1400 to 2200 4 d/wk for 2 wks. Frequency of matings, forced matings, and cloacal contacts were obtained from the videotapes. At the end of the observation period we recorded comb, wattle, and spur size for each experimental male. Bilateral asymmetry was calculated for wattles and spurs. Manually-collected ejaculates were assessed for semen volume, sperm concentration, and mobility. Preliminary results indicated that contrary to our prediction, 1M had higher mean mating frequency than 3M (P=0.006), but the 1M and 3M groups did not differ in the frequency of forced mating. Both groups had a strong diurnal variation in reproductive behavior, with peak activity between 2000 to 2100. Male morphometric traits were unrelated to mating, force matings, or cloacal contact frequency, however, males mating more often had lower sperm concentration (P=0.043), and tended to have poorer mobility as well (P=0.061). Our results do not support the hypothesis that size of secondary sexual characters or asymmetry predict mating ability in broiler breeders, nor does male-male competition positively impact their mating frequency. Elevated mating activity in the evening may be related to optimization of timing of fertilization.

Key Words: Broiler breeder, Reproductive behavior, Semen quality, Morphometry


The effects of light intensity and photoschedule from the point of photo-stimulation on the egg production traits of broiler breeders were evaluated. A flock of Cobb-500 pullets were reared in floor pens from 1 d to 20 wk of age under 10 lx light intensity (LI). At 20 wk of age, 128 pullets were caged in individually lit cage units in one of eight, light tight, computer controlled environmental chambers. Birds were photo-stimulated at 22 wk of age with either a 12L:12D (12HR) or a 16L:8D (16HR) photoschedule and one of four LI (1, 5, 50, or 500 lx) in a 2 X 4 factorial design. Egg production and laying patterns were individually monitored until 53 wk of age, when carcass and reproductive morphology was examined. Blood samples were taken at 32, 36, 40, and 53 wk of age for determination of plasma estradiol-17β (E2) concentration.

High LI (500 lx) accelerated sexual maturity by 9 days but produced first eggs that were 12% lighter than their low light intensity counterparts. Egg production of the 12HR birds was delayed compared to 16HR birds due to a slower sexual maturation, but did not decline as quickly as the birds age, resulting in similar egg production (135 eggs). Not only did the 1 lx birds lose potential egg production at the onset of lay due to delays in sexual maturation, but they also underwent sudden declines in egg production by 50 wk of age, when their rate of lay was 39.2% compared to 60.4% in the higher light intensity treatments. Total egg production was 123, 138, 139, and 139 eggs for 1, 5, 50, and 500 lx birds to 53 wk. The 1 lx and 12HR birds, both of which were delayed in entering lay, were 4.0% and 4.5% more than their counterparts, respectively, at the onset of lay, and 8.5% and 4.7% more, respectively, by the end of the trial. The plasma E2 concentration were similar at sexual maturity, but 12HR values were 13% greater than 16HR values by 32 wk, and grew to 15% greater at 53 wk. At 53 wk, 12HR-1lx E2 values were 152 pg/mL compared to 110 pg/mL in 16HR-1lx birds. There was an associated 19 g (32%) reduction in 16HR-1lx ovary weight and 1.08 drop in E2 values such that Strain B produced larger eggs than Strains A and C

Key Words: Broiler breeder males, Accudenz, Sperm mobility, Ultrasound, Testis size
that long days (16HR) were more detrimental to long-term productivity than high light intensity (500 lx).

Key Words: Broiler breeder, Light intensity, Photoschedule, Photorefractoriness.

21 The effect of age at photostimulation on breeder hen and chick IBD and REO serum titers. M.S. Lilburn*1 and R. Owen*, 1The Ohio State University, 2Hubbard Farms.

Vaccination of commercial broiler breeder hens is designed to stimulate antibody production in hens for subsequent immunization of chicks via deposition of maternal antibodies in the yolk. The success of a given vaccination program can be assessed by measuring antibody titers in the sera of vaccinated breeder hens or their progeny. In the current experiment, Hubbard grandparent pullets were reared in 24 pens with litter floors with an 8 h photoperiod from 2 wk through photostimulation. All pullets were vaccinated at 12 and 18 wk with Bursa and then Reo vaccine (MERIAL SELECT). At 20, 22, and 24 wk of age, all the pullets in each of 8 pens were moved from the rearing room to 8 pens in a room equipped for egg production and the photoperiod was immediately increased to 16 h. At 6 and 12 wk post-photostimulation, all hens from the same photostimulation-age treatment were bled from the brachial vein and artificially inseminated with pooled semen. Eggs were collected for 10 days and hatched chicks were randomly allocated to battery brooders for three d post-hatch and then bled for serum titer determination. There were no significant effects of age at photostimulation (20, 22, 24 wk) or wk post-photostimulation (6 or 12 wk) on IBD titers in hens. Hen age at photostimulation had no effects on chick IBD titers but there was a hen age X sample age interaction because of the lower 6 wk titers in chicks from hen#s photostimulated at 20 and 22 wk. There was an increase in REO titers in chicks from hen#s photostimulated at 24 wk. The coefficient of variation (CV) for both hen and chick titers was considerably higher for REO vaccination titers compared with IBD titers.

Key Words: Broiler breeders, IBD, REO, Vaccination.

22 Evaluation of incineration for disposal of poultry mortalities. E. H. Simpson1, J. P. Blake2, J. O. Donald3, and R. A. Norton2, 1Department of Ag Economics and Rural Sociology, 2Department of Poultry Science, 3Department of Biosystems Engineering, Auburn University, AL.

Alternative methods for disposing of poultry mortalities have been explored for many years. Older methods of disposal, such as pit burial, chemical and biological digesting, and composting, have come under increasing scrutiny and regulatory pressure. Recent advances in refractory materials and better engineering have contributed greatly to improvements in incinerator efficiency. This study was designed to measure the efficiency and operational costs of several incinerators in poultry farm settings. Four breeder broiler farms with two houses and three broiler farms, each with four houses, in north Alabama were selected. Each participant agreed to pick up, count, and weigh the mortalities daily, and to keep records of fuel usage and any additional maintenance expenses. Farm #1, a breeder flock, had an average mortality weight of 5.61 pounds over the 9-month test, and averaged 18.95 pounds of mortalities per gallon of fuel. Farm #2, a broiler farm, had an average mortality weight of 2.32 pounds over the 4-flock test period, and averaged 25.93 pounds of mortalities per gallon. Farm #3, a broiler farm, had an average mortality weight of 0.87 pounds over the test period, and averaged 49.81 pounds of mortalities per gallon. Operational costs were calculated, based on 85 cents per gallon for propane and 98 cents per gallon of diesel. Farm #1 averaged 4.50 cents per pound with a range of 4.34 to 4.72. Farm #2 averaged 3.65 cents per pound with a range of 2.69 to 4.01, and Farm #3 averaged 1.97 cents per pound with a range of 1.83 to 2.07. While these differences in efficiency and cost represent wide variability in specific model design and operation, a major reason in differences was observed to be in cull management within the first week of growout. Microbiological samples of residual materials remaining after incineration were examined and were found to be virtually devoid of detectable levels of bacteria. Incineration is shown to be a very cost effective, environmentally friendly method of disposal.

Key Words: Poultry, Mortality, Incineration, Economics.

23 Disposal of dead poultry by feeding the carcasses to Dermestid beetles. R. Balander*, P. Ocello, and N. Napolitano, Michigan State University, East Lansing, MI.

A trial was conducted to evaluate the feasibility of using Dermestid beetles (aka carrion beetles) to dispose of dead poultry carcasses. A starter colony of beetles and larvae were obtained from the anatomy lab of the MSU veterinary school. The colony was kept in a 300 gallon livestock watering tank covered with a wire screen and maintained in a heated environmental room. Three to five dead chickens were placed in the tank and monitored daily until the flesh was gone. Supplying dead birds and monitoring daily continued as the bug colony grew. At about 4 months into the trial, the colony was consuming 6 dead birds a day or about 25 pounds of dead chicken. The “dead meat” odor was however horrendous. At about 7 to 8 months into the trial, the colony became contaminated with red-legged ham beetles and began to decline. The contents of the tank were disposed of and the colony was restarted for a second trial. Several observations: 1. The bugs do not eat feathers or bones. 2. The bugs prefer 70 degrees F or above, at lower temperatures, consumption declines considerably. 3. The odor is horrendous and difficult for some people to work around. It also impregnates your clothes and the walls of the facility. 4. Good fly control is a must. 5. The colony does not survive well in a Michigan winter in an unheated room. 6. Contamination by other species of beetles is a problem. 7. The frass or bug excreta has a pH between 7.0 and 8.4, with a high content of calcium, phosphorus, potassium and sulfur (all over 10,000 PPM). Sodium averaged about 4800 PPM. If the problems of the odor can be overcome, the use of Dermestid beetles may have potential for dead animal disposal in warm weather climates.

Key Words: Dermestid beetles, Dead bird disposal.

Immunology

24 Combinations of tumor regressor and progressor major histocompatibility (B) complex haplotype exhibit gene dose effects on Rous sarcomas. R. L. Taylor, Jr.* and T. A. Tupick, 1Dept. of Animal and Nutritional Sciences, University of New Hampshire, Durham, NH 03824.

In a major histocompatibility (B) complex (MHC) gene dosage model, disomic chickens had significantly lower Rous sarcoma tumor growth than trisomic but not tetrasomic chickens. The current study examined MHC gene dosage effects on Rous sarcomas using combinations of regressive (B19) and progressive (B7) haplotypes. Matings between Line UNH 193 B19 x B19 (disomic) and B19 x B19 (trisomic) progeny. MHC chromosome dose was verified by counting feather pulp cell nucleoli under phase-contrast microscopy. Fifteen flock forming units (pfu) of subgroup A Rous sarcoma virus (RSV) were inoculated in the wing-web of six-week-old chicks. Tumors were scored for size six times over 10 weeks post-inoculation followed by assignment of a tumor profile index (TPI), which indicates the degree of tumor growth. The TPI values were 1 = complete regression by 28 days, or earlier; 2 = complete regression by 42 or 56 days; 3 = complete regression by 70 days, or a decreasing slope, or complete regression by 56 days followed by recurrence; 4 = general upward trend, or plateau or slight regression after 56 days; 5 = terminal tumor prior to 70 days. Mean tumor size scores were analyzed using repeated measures ANOVA. Rank transformed TPI values were evaluated by ANOVA. Fisher’s Protected LSD at P <0.05 separated significant means. Tumors developed in 29 B19 x B19 and 36 B7 x B19 chickens. Mean tumor growth over time and mean TPI were significantly lower in B19 x B19 chickens compared with B7 x B19 chickens. Microscopic examination of tumor cells revealed no change in the nucleoli number suggesting that tumor growth did not alter MHC chromosome dosage. These data indicate that two doses of the regressive B19 haplotype are significantly more effective against Rous sarcomas than one dose of the B19 haplotype when combined with the progressive B7 haplotype.

Key Words: B complex, Rous sarcoma virus, Trisomy.