different between all litter types at wk 0; hay-6.23\(^{a}\), 50/50-5.76\(^{a}\), and PS-4.72\(^{a}\) (p<0.05), but at 14 wk there were no differences. Moisture content was not significantly different at wk 0, but there was a litter X MA interaction at 14 wks: 1) 22.5\(^{a}\), 2) 28.1\(^{a}\), 3) 23.3\(^{a}\), 4) 25.0\(^{ab}\), 5) 23.3\(^{a}\), and 6) 28.3\(^{a}\) (p<0.05). At 14 wk, treatment 5 had significantly higher ammonia levels, 1.40 ppm\(^{a}\), 2) 2.99 ppm\(^{a}\), 3) 3.39 ppm\(^{a}\), 4) 3.99 ppm\(^{a}\), 5) 7.79 ppm\(^{a}\), 6) 3.89 ppm\(^{a}\). Forage analysis showed no difference between TDN among all litter types at 14 wks. Total caked litter was significantly different by litter X MA (p<0.05). At 14 wk, treatment 5 had significantly higher ammonia levels, 1.40 ppm\(^{a}\), 2) 2.99 ppm\(^{a}\), 3) 3.39 ppm\(^{a}\), 4) 3.99 ppm\(^{a}\), 5) 7.79 ppm\(^{a}\), 6) 3.89 ppm\(^{a}\). Forage analysis showed no difference between TDN among all litter types at 14 wks. Total caked litter was significantly different by litter X MA (p<0.05).

Effects of Applying Air Velocity Under the Slats of a Commercial Broiler Breeder House on Manure Characteristics, W. A. Dozier\(^{1}\), M. R. Kover\(^{1}\), R. A. Renena\(^{1}\), and M. J. Zuldhoh\(^{2}\), 1 University of Alberta, 2 Alberta Agriculture, Food and Rural Development.

Chickens have been seced on the basis of feather growth for many years, but the slow feathering gene has only recently been incorporated into a line of turkeys. This study was conducted to compare fast and slow feathering turkey females in regard to body weight (BW) gain, carcass composition and reproductive fitness. A total of 864 fast-feathering (FF) and slow-feathering (SF) pouls were reared on either a control (CON) or a high-energy, high-protein (HIGH) diet. Birds were photostimulated at 29 or 31 wk. Body weight was measured weekly to 4 wk of age and biweekly to 31 wk of age. Carcass characteristics (girth, shank, keel, breast width, breast muscle, fatpad, liver, ovary and oviduct) were assessed in 96 turkeys at each of 6 wk, 12 wk of age and at photostimulation (PSTIM). The HIGH diet increased BW gain in both strains from 4 d to 28 wk of age to a maximum increase of 16.9% in FF and 7.9% in SF birds, at 12 wk. Overall BW of FF birds was greater than SF birds from 4 d to PSTIM, to a maximum increase of 10.4% at 26 WK. Strain did not affect BW in CON-fed birds until after 16 wk when FF birds were 3.1% heavier than SF birds. At 6 wk and 12 wk, FF birds fed the HIGH diet had increased girth (6.0%, 7.0%), keel (5.4%, 6.2%), breast width (10.6%, 11.8%), breast weight (11.3%, 23.5%) and decreased liver wt (10.2%, 25.9%) than those fed the CON diet. At 12 wk, SF birds fed the HIGH diet had increased girth (2.8%), keel (2.1%), breast weight (5.6%) and breast weight (14.3%), while percent liver wt decreased 11.0% compared to those fed the CON diet. Strain differences included a 14.1% increase in breast muscle weight in SF over FF birds fed the CON diet at 6 wk, and a 17.3% and 7.4% breast muscle weight increase in SF birds fed CON and HIGH diets, respectively, when compared to FF birds. Girth was increased at 6 and 12 wk (3.0%, 3.5%) in SF over SF birds fed the HIGH diet, and % liver weight was increased (0.19%, 0.12%) in SF over FF birds fed the HIGH diet. At PSTIM, FF birds had increased shank length (2.8%) and breast width (5.2%) when compared to SF birds. These data suggest that SF turkeys grow at a reduced rate during rearing, however, carcass growth can catch-up by 12 wk with increased nutrient intake. The percent breast muscle is increased in SF compared to FF birds.

Key Words: Turkeys, Feather sexing, Carcass composition, Growth rate

Production and Utilization of Poultry Litter in Tennessee, C. Goan\(^{1}\), L. Warren, B. Park, and R. Roberts, University of Tennessee, Knoxville, Tennessee, USA.

A survey was conducted in 2001 to determine (1) number of Tennessee poultry farms, (2) bird capacity per farm, (3) tons of litter produced, (4) tons of litter used on farm, (5) tons of litter transported off farm by farm owner, (6) tons of litter transported off farm by nearby farmers and (7) tons of litter transported off farm by litter haulers. Poultry company field technical representatives assisted with the survey by obtaining information from poultry farmers under their supervision. The survey revealed there were 727 poultry farms which produced approximately 232,535 tons of litter. Approximately 52 percent of the litter produced was utilized in the poultry farm owner’s operation, while 21 percent of the litter was removed from the farm by poultry litter haulers, 16 percent of the manure was removed from the farm by the owner and 10 percent of the litter was removed and used by nearby farmers. With respect to EPA’s proposed CAFO regulations, the survey revealed that in the proposed two tier structure, there were 502 poultry farms with less than 50,000 chickens and 225 farms with 50,000 or more chickens. In the proposed three-tier structure, there were 291 farms with less than 10,000 chickens, 381 farms with 30,000 - 99,999 chickens and 55 farms with 100,000 or more chickens. The number of farms that would be affected by the proposed CAFO regulations is far greater than EPA’s estimate.

Key Words: poultry litter, CAFO regulations

Effects of Applying Air Velocity Under the Slats of a Commercial Broiler Breeder House on Manure Characteristics, W. A. Dozier\(^{1}\), M. Czarick, J. L. Wilson, C. Ritz, and W. Merka, The University of Georgia Athens, GA.

Broiler breeder manure contains approximately 60% moisture at the end of the production cycle. The high moisture content of manure limits the application to cropland because of its poor handling characteristics. A study was conducted in a commercial broiler breeder house to examine the effects of air velocity on manure characteristics during a production cycle. Prior to bird placement, a fan (1/10 HP, RPM = 1,625) was placed on top of the litter and an 18.3 m polyethylene tube was attached to the fan. Five-cm holes were located on the sides of the tube and the holes were spaced on 61 cm intervals. Manure temperature, manure height, and manure moisture were measured at 4 d, 6 wk, 12 wk, and 15 wk. Sub-samples were collected on 3.0 m intervals approximately 20.3 cm from the tube. Six sub-samples were also collected in a similar manner at a location in the house where forced-air was not applied, which served as the control. The duration of the study was intended for 45 wk; however, the manure collapsed the tube by 15 wk resulting in terminating the experiment. At 4 d, manure temperature and manure height were similar between the two treatments, but the area receiving air velocity had less manure moisture (33.9 vs. 45.0%). In parallel to data collected on 4 d, manure moisture at 6 wk was reduced with the air velocity treatment (47.9 vs. 55.6%). However, samples taken at 12 and 15 wk subjected to the air velocity had reduced litter temperature (16.4 vs. 18.0\(^{\circ}\) C; 15.0 vs. 18.2\(^{\circ}\) C) and decreased litter moisture (37.8 vs. 45.9%; 21.2 vs. 44.3%), respectively. These results demonstrate that applying air velocity for 15 wks reduces manure moisture by 47% in a commercial broiler breeder house. Additional research is warranted to determine an effective setup using a fan with a polyethylene tube throughout the 45 wk production cycle.

Key Words: Broiler Breeder, Environment, Manure

Political and public concern outweigh scientific recommendations when developing policy to reduce eggborne salmonellosis due to Salmonella Enteritidis. N. H. Elsalawy\(^{1}\) and A. M. Thaler, Animal and Egg Production Food Safety Staff, Food Safety and Inspection Service, USDA.

In 1999, the President’s Council on Food Safety commissioned an Egg Safety Action Plan to eliminate all eggborne Salmonella Enteritidis (SE) salmonellosis human illness by 2010. The Egg Safety Action Plan strongly emphasizes reducing on-farm SE contamination of eggs, unless the eggs are destined for a process that includes a step to eliminate SE. Science does not support that further on-farm action/registration will significantly reduce egg contamination or the incidence of human salmonellosis. Many egg producers have taken all known reasonable precautions to prevent SE infection of their flocks; several states have implemented successful, voluntary Egg Quality Assurance Plans to this end. Because there is some risk for ingesting eggborne salmonellosis, aware and proactive individuals can eliminate their risk of developing salmonellosis during egg production, will eliminate any risk of salmonellosis. Efforts and resources
would be spent more effectively on developing food safety education regulation for food handlers and consumer education campaigns. To make more reasonable its goal of eliminating eggborne SE salmonellosis, Egg Safety Action Plan implementation must focus on aggressively pursuing educating the public on egg food safety issues.

Key Words: Salmonella Enteritidis, Egg, Policy, Education, On-Farm

81 Consumer Food Preparation Habits and the Perception of Irradiation and Hormone Use in Delaware. K. G. Maciorowski1, 2, S. G. Birkhold1,2, and S. C. Ricke1, 2 Delaware State University, Dover, DE, 2 Texas A&M University, College Station, TX.

Broiler production continues to be an integral part of Delaware’s economy. In July 2001 and March 2002, a poultry consumer survey was conducted in Delaware. Fifty consumers in each of 3 supermarkets were asked multiple-choice questions concerning food preparation habits, food safety education, and their opinions on irradiation and the use of hormones in broiler growth. The respondents were mostly either Caucasian (72%) or African American (25%), female (76%), possessed either a high school diploma (37%) or college degree (24%), and were greater than 36 years of age (74%). A majority of consumers either considered poultry to have the greatest chance of harmful bacteria (36%) or all meats to have an equal chance of contamination (34%). Sixty percent of consumers surveyed consider bacteria to be the most important food safety issue, though 63% have never used a food thermometer. A majority of respondents (83%) do not leave chicken in the refrigerator for greater than 2 days and 56% thaw chicken in the refrigerator. Television was the media source that most respondents (25%) received food safety information from, followed by schools (19%) and books (11%). A majority of respondents have never been sick from food (53%), would not eat irradiated chicken (42%), and believe that hormones are used in poultry production (85%). Additional educational programs may be needed before irradiation is accepted in Delaware.

Key Words: Consumer, Irradiation, Hormone

82 Toxicity Testing and Risk Assessment of Natural Contaminants in Animal Feed: A Regulatory Perspective. Michael H. Henry* and Randall A. Lovell, 1 Center for Veterinary Medicine, Food and Drug Administration.

Natural toxic contaminants in animal feed may cause injury to animals, economic losses to producers and serious public health hazards. To ensure the safety of the human food supply, risks associated with consumption of the contaminants are determined by regulatory scientists using all available scientific information for both animals and humans. There is a close relationship between the adequacy of toxicity testing and the reliability of the risk assessment. When toxic contaminants are present in animal feed and feed ingredients, estimation of human risk is complicated because the quantitative relationship between the level of the contaminant in animal feed and the dose of contaminants consumed by people must be determined. Thus, comparative human and animal data on the pharmacokinetics and pharmacodynamics of the toxicant should be available to the regulator. Often, these data are provided by academic scientists who conduct toxicity and metabolism studies on animal feed contaminants. While most of these studies are scientifically sound, many cannot be used for assessing the risks of toxicants in animal feed. Some of these studies cannot be used by the regulator because the design and conduct of the study does not comply with the Agency’s Good Laboratory Practice regulations (21 CFR, Part 58). To improve the design and conduct of academic studies so that they can be used by regulators to more reliably predict risk, certain factors should be considered by the academic investigator. This presentation will discuss some of those factors, and will describe how they would improve risk assessments for toxicants at regulatory agencies.

Key Words: Toxicity, risk assessment, contaminants, feed

83 User friendly trap for feral poultry. F. A. Bradley1, 2, B. A. McCrea1, and P. V. Tepus2, 1 University of California, 2 City of Palos Verdes Estates.

Nationally feral poultry problems are on the increase. Local agencies and property owners alike are faced with trapping unwanted chickens and domestic waterfowl. In addition, nuisance complaints concerning other introduced species, such as peafowl, are escalating. Traps designed for live-trapping of mammals are often used unsuccessfully by those plagued with the feral birds. A trap that is easy to construct and use was developed at the University of California, Davis. The nature of the trap allows for customizing to suit the area (residential backyard, homeowner association’s beachfront, or municipal lawn). The average trap size is 10’ X 20’ X 4’. Eight 6’ high T-posts and 4’ high plastic barrier fencing are used to form the trap’s perimeter. Tent stakes are used to secure the base of the fencing to the soil. One 7’ T-post is used as a center support for the trap’s safety for birds protective mesh covering. The covering edges overlap the top of the barrier fencing. PVC pipe (1”) is assembled with elbows and T fittings to make a door frame. In turn, the frame is covered with barrier fencing. All trap parts are connected using 8” cable ties. Pulleys and rope attached to the trap door allow for remote closure. The trap is built with a minimum of tools; only a T-post driver and scissors are essential.

Key Words: Trap, Feral poultry

84 Portable peafowl trap. F. A. Bradley1 and P. V. Tepus2, 1 University of California, 2 City of Palos Verdes Estates.

Peafowl overpopulation problems necessitate ongoing trapping in the City of Palos Verdes Estates (PVE), CA. The user friendly trap (UFT) for feral poultry, developed by the University of California, Davis (UCD), is being used in PVE. However, there are sites where the trap is unsuitable. The UFT is designed to be erected on soil or lawn. Large peafowl flock regularly on residential driveways. Some of these properties lack yard space suitable for the construction of the UFT. A portable trap was developed and tested by PVE and UCD staff. The 10’ X 20’ X 4’ portable trap is constructed using 1” PVC pipe and 4’ high plastic barrier fencing. PVC pipe is assembled to make the 4’ X 10’ framework. A center 4’ PVC pipe is placed in the middle of the frame with 4’ connectors. Barrier fencing is secured to the frame using 8” cable ties. Eleven panels are needed, with an open gate at one end. Side panels are connected to each other with the cable ties. The top roof panels overlap the side panels and are bolted to them with 3/8” threaded 6” bolts, nuts, and washers. The bolts go through pre-drilled holes in both panels. Pulleys and a rope of desired length are attached to the gate, allowing closure of the trap from a remote site. The trap is easy to assemble, portable, and works well on driveways, parking lots, and other impermeable surfaces.

Key Words: Portable trap, Peafowl


Problems and Prospects of family Poultry development in Bangladesh: Proshika experience. Md. Nur Miah, Senior Programme Coordinator Proshika, Dhaka

About 89 percent of the rural households in Bangladesh rear poultry with an average of 6.8 birds per holdings (BBS). Intervention of improved management, disease control measures and supplementation of balanced feed has increased the productivity of rural poultry. Poultry raising is an integral part of the rural farming system providing substantial family income in rural areas for small, marginal & unemployed poor. The present poultry production system has been divided into a) traditional rural backyard scavenging system b) semi-scavenging and c) commercial poultry farming system. The total number of chicken and duck is 138.20 and 13.00 million respectively (DLS 1997). There are about 135498 poultry farms in the country. 15% of these farms are rearing 1000-5000 birds and rest are holding 100 to 1000 birds (Rahman M. 1999). To satisfy the country requirement the production of meat and egg need to be increased by 7 and 10 times respectively. The expected production from family poultry is seriously hampered due to a lack of poultry husbandry skills b) lack of quality balanced feed c) inadequate extension services d) disorganized marking system. Potential solution like training of poultry farmers, provision of credit, ensuring extension services through development of vaccinators and paravets for disease control, marketing support have been addressed by Proshika, one of the largest NGO’s in Bangladesh. Governments subsidy on feed & exemption of tax, vat on imported equipment/ ingredients can encourage the small farmers to develop their poultry enterprises. It can be concluded that poultry production system at household and commercial level can be further developed through on time supply of training, inputs & marketing support which can eradicate the poverty of vast majority of landless, destitute women & unemployed
youth in Bangladesh. References: BBS 1997 Bangladesh Bureau of statis-
tics, Govt. of Bangladesh. Directorate of Livestock service Report Govt.
present and future presented in the international seminar organized by
WPSA Bangladesh Branch.

Key Words: Poverty, Landless, Semi-scavenging

86 Establishing an Emu Flock in Southern Russia.
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of Poultry Science, Auburn University, AL, 2Feather Hill Emu Farm,
Moneevelle, AL, 3Krasnodonskoye Agrofirm, Ilovlya, Volgograd Region,
Russia.

Krasnodonskoye Agrofirm located near the town of Ilovlya in the Vol-
gograd Region of Southern Russia expressed an interest in becoming the
first facility to establish a commercial emu flock in Russia. In cooperation
with Agricultural Cooperative Development International and Volunteers
in Overseas Cooperative Assistance (ACDI/VOCA) specialists were re-
cruited to participate in an emu flock development project. In February,
1999 a total of 200 emu eggs were transported from Feather Hill Emu
Farm for an incubation project. Due to breakage during transport, a to-
tal of 192 eggs were numbered, weighed, and placed in incubators. Eggs
were weighed weekly to verify that an average weight loss of 14% was
achieved by the 48th day. Incubation temperature and humidity param-
eters were 35.8 C and 30%, respectively, with adjustments in humidity
being made as necessary to achieve target weight loss. In April, 116
chicks were hatched (60.4% hatchability). In March, 2000 a total of 180
emu eggs were transported for a second incubation project, but due to
breakage 142 eggs were incubated. In May, 68 chicks were hatched (47.9%
hatchability). From these two batches an emu breeder flock comprised of
82 pairs was established. During both visits, information was provided to
specialists through individualized and group training. Topics included in-
cubation, breeding, management, nutrition, diseases, and processing
and marketing of emu products. Printed materials were also donated to assist
the host organization. The production of emu for meat, oil and leather
products is a new agribusiness venture in Russia. The climate in the
Volgograd Region appears to be suitable for the production of emu and
Krasnodonskoye Agrofirm has been very successful in establishing emu
as an alternative agribusiness enterprise with a long-term commitment.

Key Words: Emu, Incubation, Russia

87 Opportunities for International Scientific Ex-
change in Russia. J. P. Blake*, Department of Poultry Science,
Auburn University, AL.

There are many opportunities to share in the exchange of information
among international colleagues that are bound by a common thread.
Many organizations support agricultural based projects overseas, with
two having contributed personal experiences. ACDI/VOCA (Agricult-
ural Cooperative Development International and Volunteers in Over-
seas Cooperative Assistance) is a private, nonprofit organization that
promotes broad-based economic growth and development of society in
emerging democracies and developing countries. The Fulbright Fellow-
ship Program offers opportunities for international educational exchange.
Those projects supported by ACDI/VOCA primarily involved poultry
operations that were attempting to build partnerships, improve business
practices, increase productivity and profitability, or introduce new tech-
nologies into their operations. A Fulbright Lecturing grant afforded an
opportunity to provide lectures in poultry production to fourth-year stu-
dents at Volgograd State Agricultural Academy (VSAA). The students,
staff, and faculty at the VSAA learned about the structure and function
of the poultry industry on an international level and its functionality
in a free-market economy. One result of the Fulbright experience has
been permanent links with the VSAA. Conversely, it was an interesting
experience to learn about problems that face Russian agriculture under
present economic conditions, realizing that future changes are forthcom-
ing. It was an enlightening experience and there will always be an op-
portunity to interject my experiences into the classroom environment at
home. One may define “international understanding” as a culmination
of many individuals’ understanding of each other. Opportunities for scien-
tific exchange have contributed to an increased understanding of Russian
history, culture, politics, and social structure, and their understanding of
American culture. Interaction with faculty and students contributed to a
mutual respect and personal understanding of their professional lives,
career goals, and concerns for society.

Key Words: International, Russia, Fulbright

Nutrition A

Growth & Development

88 Effect Of Lighting Program, Strain And Vitamin
D Source On Egg Production And Bone Mineral Density
Of Laying Hens. D. R. Kover*, M. J. Zuidhof2, F. E. Robinson1,
and R. A. Renema1, 1University Of Alberta, Edmonton, AB Canada,
2Alberta Agriculture, Food and Rural Development, Edmonton, AB Canada.

The long-term shell quality of eggs from layers requires effective manage-
ment of Ca balance. Single Comb White Leghorn pullets (1000) of two
strains (Hy-Line W36 and W98) were raised in floor pens from 1 day
of age following breeder guidelines for each strain. Cholecalciferol was
the source of dietary vitamin D. At 12 wk of age, pullets (32/strain) were
individually cage, and fed diets meeting breeder-recommended nutrient
specifications and containing either cholecalciferol or (25-OH cholecalcif-
erol) as the source of dietary vitamin D activity. Birds were exposed to
one of four lighting programs which varied in age at photostimulation
(PS) (17 wk versus 19 wk) and photophase length (constant or decreas-
ing). The lighting programs were: C17: Constant 10L:14D (6 to 17 wk),
PS at 17 wk (12L:12D, increasing by 1 h/wk to 16L:8D); Pt 17 wk (12L:12D increasing by
1 h/wk to 16L:8D); C19: Constant 10L:14D (6 to 19 wk), PS at 19 wk (12L:12D,
increasing by 1 h/wk to 16L:8D); D19: Decreasing to 6L:18D (by 1 h/wk to
16L:8D); Pt at 17 wk (12L:12D increasing by 1 h/wk to 16L:8D). The experiment was a 2 strain x 2 diet x 2 PS 2 photophase
factorial design. Feed intake of each bird was recorded on a weekly basis
and egg production was recorded daily, and bone mineral density (BMD)
was measured by quantitative computed tomography at 12 wk of age,
weekly from 16 to 24 wk of age, and then at 8 wk intervals to 48 wk of age.
Weekly feed intake of the W98 was greater than that of the W36
layer at almost all ages through the trial. Egg production was not af-
fected by the treatments. Neither diet nor lighting treatments affected
BMD to 48 wk of age. The W36 hens had significantly greater BMD
than the W98 hens at all ages except 30 and 48 wk of age. BMD at 12
wk was negatively correlated with total and settable (intact shell) egg
production (r=-0.41, P=0.0213 and r=-0.45, P=0.0102, respectively) in
the W98 birds. However, BMD was negatively correlated with total and
settable eggs (r=-0.38, P=0.0313 and r=-0.40, P=0.0252, respectively)
only at 24 wk for the W36 hens. The predictive value of early bone min-
eral density measurements for total egg production to 48 wk appears to
be dependent upon the strain of laying hen examined.

Key Words: laying hen, 25-OH cholecalciferol, bone mineral density, egg
production, photostimulation

89 Low Incidence of Tibial Dyschondroplasia in Ross
Cockerels Fed A Marginal Calcium Diet Precudes a
Response to Dietary 25-Cholecalciferol. M.F. Ledwaba and K.D.
Roberson*, Michigan State University.

Three experiments were conducted to evaluate the effects of dietary 25-
cholecalciferol (25-(OH)D3) on growth performance and the incidence and
severity of tibial dyschondroplasia (TD) in male Ross X Ross chicks.
A starter diet formulated to contain 0.85% calcium, 0.45% non-phytate
phosphorus (npP) and 2200 IU/kg cholecalciferol (D3) was fed for 20
days in Experiments 1 and 2 and for 17 days in Experiment 3. The chicks
were housed in an electrically heated brood unit while fed the starter
diet. Four replicate pens of 10 chicks each were allocated randomly for six
dietary treatments in Experiments 1 and 2 which consisted of 0, 18, 36,
54, 72 or 90 µg/kg of added 25-(OH)D3. Dietary treatments in Experiment
3 were: 1) 0 µg/kg 25-(OH)D3 from 1 to 35 days of age, 2) 40 µg/kg
25-(OH)D3 from 1 to 35 days of age, and 3) 40 µg/kg 25-(OH)D3 from 1-
17 days and 0 µg/kg from 18-35 days of age. The grower diet, formulated

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