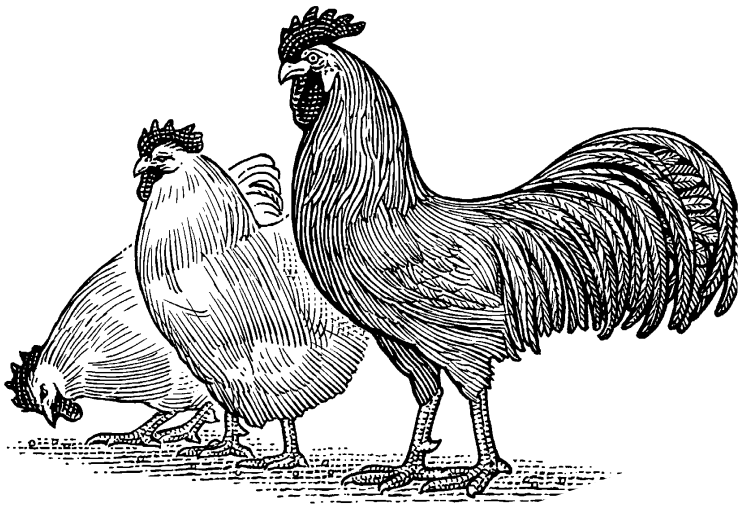
CURRENT CONCEPTS IN FALL 2002
Broiler Production

Incineration for Disposal of Poultry Mortalities

Alternative methods for disposing 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. One broiler breeder farm with two houses and two broiler farms, each with four houses, in north Alabama were selected for the study. Each grower agreed to pick up, count, and weigh the mortalities daily and to keep detailed records of all fuel usage and any additional maintenance expenses.



Farm #1, a breeder flock, had an average mortality weight of 5.82 pounds over the four-quarter test period and averaged 19.83 pounds of mortalities per gallon of fuel. Farm #2, a broiler farm, had an average mortality weight of 2.08 pounds over the 6-flock test period and averaged 24.98 pounds of mortalities per gallon. Farm #3, a broiler farm, had an average mortality weight of 0.93 pounds over the test period and averaged 49.89 pounds of mortalities per gallon.

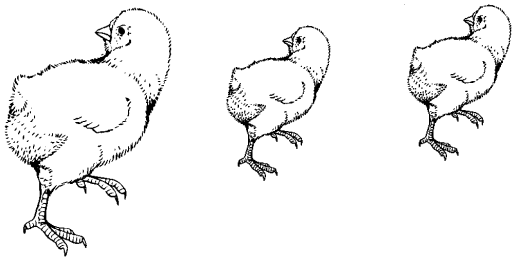
Operational costs were calculated, based on $.85 per gallon for propane and $.98 per gallon of diesel. Farm #1 averaged 4.26 cents per pound with a range of 3.55 to 4.72, Farm #2 averaged 3.59 cents per pound with a range of 2.69 to 4.01, and Farm #3 averaged 1.99 cents per pound with a range of 1.83 to 2.07. While these differences in efficiency and cost represent wide variability in specific model design and operation, it is apparent that recent technological advances make possible incineration costs that are quite attractive relative to traditional alternatives.

In this study, a major reason in differences was observed to be in cull management of broiler chicks during 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.

Gene Simpson, John Blake, Jim Donald, and Robert Norton of Auburn University's College of Agriculture provided this information.

AUNotes From Joe Hess, Extension Poultry Scientist

Poultry Science Department efforts in the areas of food safety and poultry product quality continue to increase under the guidance of the Poultry Science Peaks of Excellence Program. The department recently recruited Dr. Shelly McKee, a poultry products specialist formerly at the University of Nebraska, to enhance efforts in this area. In addition, two slots are being advertised for food safety microbiologists (one from the peaks program and one to replace Dr. Conner). When these positions are filled, Auburn poultry science will be in position to work with other departments on campus to greatly increase our efforts in the poultry products area. We hope that the industry continues to play an active part in shaping these programs so that our efforts are applicable to field needs and situations. Significant progress has been made on the new Poultry Science Building this summer due to an abundance of bluebird days. Check our Web site for updated pictures.



Feeding Broiler Breeder Pullets Post Peak

Body weight control of broiler breeder hens is a headache from day one of age to the end of the production cycle. Alternate feeding programs to control body weight during the growing and laying phases are of interest to pullet and breeder managers. The industry is constantly reviewing current feeding programs and attempting to find easier and/or more effective ways to control body weight and ensure optimum reproductive performance.

Removing substantial feed during or just after peak is one technique that has been introduced in the last few years to reduce feed costs and control body weight. This allows managers to reduce feed allotments at a moderate rate, although a relatively large amount of feed has already been taken away from the hens. Programs of this type are being utilized in the field and have been accepted by many of the primary breeders as viable options. Research efforts to examine the production and economic effects of these programs are limited, but they do provide some analysis of the technique.

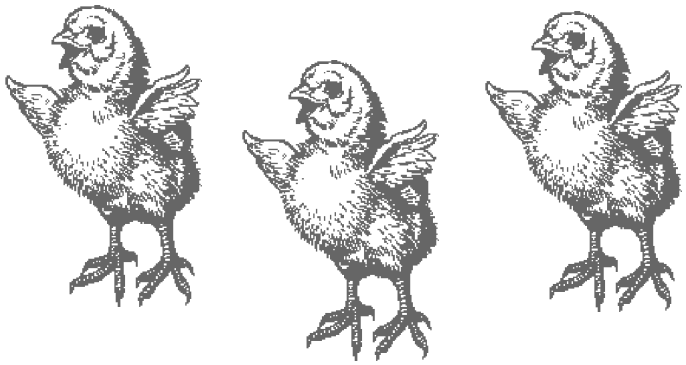
Ron Meijerhof and others (Poultry Science, 1997) peaked Ross breeders on 36 lbs/100 to 29 weeks, then reduced feed substantially to 32 weeks. Feed allocations were then adjusted to body weight gain to control body weight. Hens gained less weight than controls, had lowered egg production, but improved fertility late in the production cycle. Feed savings of 0.022 lb/hatching egg were realized using this technique. Work at Auburn has applied a similar feeding program to commercially raised Cobb 500 hens selected as light (4.00 lbs) or heavy (4.75 lbs) at 20 weeks. The groups were peaked on different levels of feed [34 lbs/100 for light hens (450 cals/day), 35.5 lbs/100 for heavy hens (470 cals/day)]. Then feed was removed at different rates at peak. Feed removal treatments were 0.9 lb/100 decrease over 3 weeks starting 3 weeks after peak and 0.15 lb/100/week after that (slow) or 2.4 lbs/100 decrease over 4 weeks starting at peak and 0.25 lb/100/week after that (fast). Hens were kept to 60 weeks.

Hens with feed removed at a slower rate showed more body weight gain and higher final body weights than those for which a more severe feed removal was used (9.24 lbs vs. 8.41 lbs at 60 wk). Light hens given a fast-feed removal program gained very little over 25 weeks, going out at around 8 lbs. Egg production was 4.7 eggs ahead for hens on the slow treatment at 60 weeks. This is in agreement with the work reported by Meijerhof in that hens that had substantial feed removed at peak laid fewer eggs. Egg production was not reduced substantially at peak with fast-feed removal. This is interesting as peak egg mass and peak nutrient need is generally just after peak, when egg production is good and egg size has increased. Fast-feed decrease hens laid fewer eggs between 40 and 50 weeks of age. Light hens appeared to have the best production at the conclusion of the trial (60 weeks of age). This may have left light hens in an even more favorable light if the trial had been extended to 65 weeks of age. Light hens did not have lower production on the slow treatment, but were seven-tenths of an egg behind on the fast treatment.

Egg size was reduced in hens with a fast-feed decrease rate (26.9 vs 27.5 oz/doz average), with little effect of heavy or light hens in this case. It appears that fast-type feed reductions can control body and egg weights. Controlling late egg size should translate into improvements in eggshell quality as well. The important question becomes whether improvements in egg size and egg costs per dozen more than make up for lost egg production. Settable egg costs were similar between slow- and fast-feed decrease treatments ($1.412/doz vs $1.404/doz), indicating that most of the savings gained through body weight/feed savings were lost in reduced egg production. Light hens, on the other hand, showed an improvement in settable egg cost over heavier hens ($1.384/doz vs $1.431/doz). Indications are that the light hens on the fast-feed removal would have finished with a better settable egg cost than other treatments if our trial had extended beyond 60 weeks of age.

These results indicate that production costs can be reduced through feed savings with rapid-feed removal at or after peak. Losses in egg numbers per bird can quickly negate any advantages gained through feed savings. Fertility gains through lower body weights may add value to the fast program if fertility values are improved as has been reported by Meijerhof.

This information was provided by Joe Hess and Roger Lien of the Auburn University Poultry Science Department and is excerpted from the proceedings of the 2001 North Carolina Broiler Breeder and Hatchery Management Conference held in Statesville, NC Oct. 31, 2001.



Irradiation of Poultry Meat

Irradiation of poultry meat was approved in 1992 by the USDA as an effective way to pasteurize the product in order to reduce bacterial contamination and provide a more wholesome product (Lutter, 1999); however, the poultry industry has been slow to adopt this technology. Carrotop Foods has been marketing irradiated chicken for several years with great success, which indicates that the public is willing to buy irradiated products. In fact, the public has been, unknowingly, buying irradiated spices for years. Many nursing homes and hospitals also use irradiated poultry.

Millions of cases of illness could be avoided by using this technology on meat (Lutter, 1999). People will be receiving a safer, longer-lasting product at a minimum increase in cost: a win-win situation. In addition, by investing in this technology, a company can recoup the original cost through longer shelf life and a higher quality product.

Four main pathologic bacteria of primary concern are associated with poultry: *Listeria*, *Campylobacter*, *E. coli*, and *Salmonella*. These bacteria, plus spoilage organisms, are effectively reduced by irradiation (Jay, 2000). This is accomplished through irradiation breaking down bacterial DNA, rendering it unable to reproduce (Jay, 2000). Decontamination of food by irradiation is safe, efficient, environmentally clean, and energy efficient. The food never becomes radioactive and is essentially the same as nonirradiated food after the process is over (Farkas, 1998). The use of this technology could become an important tool for the poultry industry.

Bibliography

Farkas, J. Irradiation as a method for decontamination food. A review. International Journal of Food Microbiology. 44(3)189-204, 1998.

Jay, James. Modern Food Microbiology, sixth edition. 2000.

Lutter, Randall. Food Irradiation. The Neglected Solution to Food-Borne Illness Science. 286:2275-2276, 1999.

Robert Voitle of Auburn University's Poultry Science Department provided this information.

Research Shorts

Recent Research of Interest to Poultry Managers

Miles, D.M., S.L. Branton, B.D. Lott, and J.D. Simmons, 2002. Quantified detriment of ammonia to broilers. Poultry Science 80 (Suppl. 1): 54.

Broilers in chambers showed the following reductions in body weight compared to broilers held without ammonia; 25 ppm – 1.7 percent reduction after 3 weeks, 50 ppm – 12.3 percent reduction after 4 weeks, 75ppm – 22.6 percent reduction after 4 weeks. Chamber trials do not reflect field situations, but they do give a glimpse into how ammonia levels may affect bird performance.

Timmons, J.R., J.M. Harter-Dennis, and A.E. Sefton, 2002. Effect of a high coefficient of variation of inorganic phosphorus consumption on 0- to 20-day-old male broilers. Poultry Science 80(Suppl. 1): 71.

Broilers were fed two times their phosphorus needs every other day versus the correct amount every day. It was found that broilers could do reasonably well in bone mineralization and growth, if this nutrient was not provided as we would want. This information is of interest in light of feed mixability and phytase inclusion questions.

Lien, R.J., J.B. Hess, and W.D. Berry, 2002. Influence of peak and post-peak feed allotments on broiler breeder egg production. Poultry Science 80(Suppl. 1): 3.

Cobb breeder hens were peaked on high (36.2 lbs/100 hens/day) or low (33.8 lbs/100 hens/day) feeding programs. Two pounds of feed were removed over a 2-week period post peak from each group, and relative feed removal for the rest of the production period was similar (23.3 percent). Birds on the high-feeding program produced 13 more eggs per hen than those on the low-feeding program, with much of the loss coming between 55 and 65 weeks.

Berrang, M.E., J.K. Northcutt, D.L. Fletcher, and N.A. Cox, 2002. Role of transport coop fecal contamination in the transfer of *Campylobacter* to carcasses of previously negative broilers. Poultry Science 80(Suppl. 1): 47.

Campylobacter-negative broilers were held in transport coops for 2, 4, or 6 hours after removal of Campy-positive broilers. Sampling after processing revealed more than 50 percent *Campylobacter*-positive birds in all three samplings, indicating that transport coop cleanliness can have an important role in *Campylobacter* contamination of previously clean birds.

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