L. Bynum Driggers

1970 - 1971

PROGRESS REPORT - FARM STRUCTURES

Major emphasis was placed on systematized planning and development of livestock and poultry housing including waste management, with particular attention on environmental control and its effect on performance.

Poultry Housing

Applied research efforts continued to draw attention to the effects of environment on the performance of birds in order to optimize genetic and nutrition responses.

Caged Laying

Two on-farm tests with commercial producers provided a study of environmental conditions in similar houses, one mechanically ventilated with natural air, House I, and the other evaporative cooled, House II.

The inside temperature of House I during the summer was a maximum of 4^{o} F above outside temperature, but no detrimental production effects were experienced. The highest outside temperature during the monitored period was 93^{o} F.

The birds were housed on September 7, 1969, and layed until November 28, 1970. Winter conditions were reported last year.

For the entire lay period egg production averaged 56.2 percent or a total of 251.8 eggs per hen housed, with an average of 3.803 pounds of feed per dozen eggs, or 20.23 pounds of feed per 100 birds per day.

Mortality ran 23.9 percent, including 3 percent mortality due to a blown fuse in the fan circuit one summer night.

Egg grades averaged 55 percent large and above, 30.7 percent mediums, 5.6 percent smalls, and 8.7 percent undergrades.

Total power costs for the entire lay period were 9.78 cents per bird housed, of which 4.47 cents accrued to the fans, based on electricity at 2 cents per kilowatt hour.

House II

The evaporative cooler was effective in reducing inside temperatures during daily peak temperature periods, but these conditions were accompanied by a very high relative humidity. The greatest difference between the inside and outside temperature was 7^{o} F, but the inside relative humidity was above 85 percent.

The birds were housed on September 28, 1969, at 24 weeks of age and layed until January 4, 1971.

For the entire lay period, egg production averaged 52.3 percent or a total of 241.6 eggs per hen housed with an average of 4.181 pounds of feed per dozen eggs, or 21.62 pounds of feed per 100 birds per day. Mortality was 31.5 percent.

Egg grades averaged 61.4 percent large and above, 21.9 percent mediums, 2.6 percent smalls and 14.1 percent undergrades.

A comparison of Houses I and II and a conventional open type house 10 feet wide was made; the results are recorded in Table 1. This is an objective of these studies - to make available sound data on which business decisions can be based.

Table 1. Performance of commercial layers in three types of housing up to 69 weeks of age, 1969-70.

	(House 1) Conventional	(House 2) Mechanically Ventilated	(House 3) Evaporatively Cooled
Cost per dozen eggs produced:			
Feed	$.164	$.155	$.157
Labor	.035	.011	.015
Miscellaneous	.013	.004	.009
Hen depreciation	.092	.069	.083
Overhead	.007	.031	.032
Total	$.311	$.270	$.296
Number hens housed	13,305	30,555	30,945
Percent livability	64.5	81.6	77.4
Eggs per hen housed	167.9	190.3	181.0
Feed per dozen eggs (lbs.)	3.951	3.715	3.905
Undergrade eggs (percent)	11.4	6.7	13.1

Swine Housing

Emphasis continued to be placed upon systematized planning of swine buildings and equipment in which labor is minimized, proper environmental conditions provided, and waste handled and disposed of in an acceptable manner.

Ten extension sponsored meetings throughout the state were conducted by this specialist to discuss the need for good planning and the various types of facilities for each purpose.

In 1970, 5602 plans for swine buildings and equipment were distributed, and 1220 in the first half of 1971.

Office conferences, telephone calls, and direct written communications were other methods used in disseminating the educational information to the public.

As a result of previous studies, intensive production units are installing zone air conditioning to relieve the heat stress on sows in the farrowing house, and many are now using fan ventilation.

A new method of exhausting ventilating air from the pits under slotted floors was incorporated into several houses in hopes of reducing odors during cold seasons, when minimum ventilation is needed. The results are very encouraging.

Plans were completed for a 90-sow unit at the Upper Coastal Plains Research Station, and construction is underway. The new facilities are designed for optimum environmental conditions. Results obtained from these studies will be directly applicable to the commercial producer.

Waste Disposal and/or Management

As a member of the School of Agriculture and Life Sciences Animal Waste Disposal Committee, considerable time was spent in preparation of information on effective methods and equipment for proper disposal and management of animal wastes, and also guidelines for use by ASCS and SCS in constructing animal waste lagoons.

Committees Served On

(1) Swine Development Advisory Center Advisory Committee

(2) SALS Animal Waste Disposal Committee

(3) Department Student Recruitment Committee

(4) Chairman of Publicity Committee for 1971 North Carolina Farm Materials Handling Exposition

Meetings Attended and Papers Presented or Discussions Led

(1) Poultry Workshop, Biloxi, Mississippi

(2) Dairy Fieldmen and Sanitarians Conference, discussed "Farm Waste Disposal"

(3) Winter Meeting of American Society of Agricultural Engineers

(4) Quarterly Conference of Carolina Power & Light Co.'s Agricultural Development Group, discussed "Waste Disposal"

(5) Northern Piedmont Area Development Association Meeting, Greensboro, presented discussion on "Waste Disposal and Feed Handling"

(6) Southeast Region ASAE, Jacksonville, Florida, presented paper, "Performance of Mechanically Ventilated and Evaporative Cooled Totally Enclosed Commercial Laying Houses"

(7) Modern Farming Short Course, presented discussions, "Materials Handling in Livestock Operations" and "Poultry Housing"

(8) Dairymen's Conference, discussed "Farm Waste Disposal"

(9) Poultry Servicemen's School, discussed "Environmental Control in Poultry Housing"

(10) Attended Southern Region Plan Exchange Committee Workshop, Winter Park, Florida

(11) N. C. Section ASAE meeting, discussed "Lagoon Design for Farm Animal Waste Disposal"

Other Activities

(1) Lectured to BAE 251 class on housing and environmental control.

(2) Advisor to student in Honor's Program.

(3) Lectured for two periods to BAE 351 class.

(4) Taught course on Environmental and Structural Requirements in Farm Buildings at special three weeks' summer session.