

FARM STRUCTURES PROGRESS REPORT FOR FY 1969-70

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

Swine Housing

Top prices brought renewed interest to the swine industry. Producers were cautioned to plan their enterprises in detail so that as they built and developed the operation it would become a coordinated system of production in which labor could be reduced, proper environmental conditions provided, and waste handled and disposed of in an acceptable manner. Nineteen extension sponsored meetings throughout the state were conducted by this specialist to explain the need for good planning and the types of facilities available and needed. Numerous office conferences, telephone calls, and direct response to inquiries were other means of getting the educational information to the public. In 1969 we distributed 5646 building plans for swine buildings and equipment, and 4278 in the first half of 1970.

An on-farm test was begun with a commercial producer to study the performance of air conditioning as an effective zone coolant in farrowing houses. No attempt was made to cool the entire house, but only to envelop the sow in a cool stream of conditioned air. When temperatures outside soared to 96° F., conditioned air at 80° F. was enveloping the sow, keeping her very comfortable and free from maximum stress from the heat. The annual cost per stall was \$12.26. Farrowing sows each month distributes the cost so that each farrowed sow's share of the annual cost is \$1.02. Operating cost ran about 5¢ per day per sow. Results of the first summer's work (1969) are presented in a paper entitled "The Application of Air Conditioning in Farrowing Houses - A Progress Report" which was presented at the Southeast Region, American Society of Agricultural Engineers' meeting in Memphis Tennessee, February 1-3, 1970. Several producers from neighboring states have made trips to Raleigh to

discuss this method of cooling as well as the types of buildings and equipment being recommended.

A new building plan (527) was prepared for a totally enclosed slotted floor environmental controlled farrowing house.

Our efforts are being extended in other states because a cooperative is now contracting the erection of swine buildings based on North Carolina plans.

Several in-service training sessions were held for Extension agents.

Plans are being developed for a 90-sow unit at the Upper Coastal Plains Research Station. The sows will be farrowed in a totally enclosed environmental controlled house, and the pigs finished in a total slotted floor building with partial control over environment. Sows will be kept in confinement also. From this project, detailed records can be kept and studies made on the performance and operation of equipment and facilities as well as the producing animals. This will give Extension a good evaluation based on applied research. It is anticipated to coordinate the waste handling into a very thorough research project with other university disciplines.

Poultry Housing

Significant advances have been made in genetics and nutrition, but now poultrymen are aware that these accomplishments must be coupled with proper environment to maximize the use of structures and promote the best bird performance.

Caged Brooding

An on-farm test is being conducted with a producer in which day old chicks are placed in cages. Temperature, moisture, and gases are controlled in a renovated structure with a capacity of 26,000 birds, which housed only 16,000 on the floor. Results have been very encouraging except for mortality during the first week. Mortality in the last brood was 2 per cent, which is very good, but in two other

broods it was 9 per cent in one and 8 per cent in the other. We are continuing to develop the operation of the system to keep mortality in a respectable range.

Power requirements are metered for economic considerations. In each brood of approximately 25,000 chicks, the total operating cost for the feeders, waterers, heaters, fans, lights, and waste removal equipment was approximately \$100 from day old to six weeks of age. At six weeks the birds are placed in growout cage houses where they remain until placed in caged laying houses.

Caged Laying

Egg production declines in both real cold weather and real hot weather. In a caged layer study with 30,000 birds in an automated 40' x 500' house, the environment is controlled so that extreme peaks and valleys can be eliminated from the temperature curve.

January 1970 was an extremely cold month with the outside temperature dipping to 9° F. on several occasions. Temperature in the totally enclosed mechanically ventilated structure remained above 50° F. without supplemental heat; and ammonia, moisture, and other contaminants remained well in bounds.

The same producer had laying birds in a curtain wall house, and production dropped 9.5 per cent during the cold spell, but the birds housed in the totally enclosed house remained steady in egg production.

Electric power consumption by the feeders, fans, waterers, lights, pit cleaners, and egg gatherers was 67,570 kilowatt-hours for the first 8 months of the lay period. At 2¢ per kilowatt hour, this amounted to 4.5¢ per bird.

This study will continue for the entire lay period. Results from both the caged brooding and caged laying studies will be written up and disseminated to our county extension agents and others desiring this information.

At the short course for agents, I presented a discussion on structural require-

environmental requirements and
ments and effects on poultry.

Environmental conditions have been excellent in the house with natural air moved mechanically.

Additional efforts will be directed to evaporative cooling of caged laying houses and to a comparison between the two systems.

Attention will also be focused on growing broilers in totally enclosed houses.

Miscellaneous

Prepared an article on "Stand-by Generators" in case of power failure for dairy newsletter.

Participated in three-day planning session with poultry department.

Participated in two-day planning session on programs ^{for} from Extension Biological and Agricultural Engineering.

Presented paper on "Evaluation of Manure Handling Methods" at meeting of North Carolina Section of American Society of Agricultural Engineers.

Moderated a panel discussion on "Poultry House Needs and Economics" at Egg Industry Conference.

Attended and participated in summer meeting of American Society of Agricultural Engineers, Purdue University.

Discussed milk house construction and finishes at Dairy Fieldmen and Sanitarians Conference.

Attended and participated in winter meeting of American Society of Agricultural Engineers in Chicago, serving as chairman of swine housing committee and member of poultry housing committee.

Presented paper on "Heating and Cooling Swine Buildings in the South" at North Carolina Pork Producers Conference.

Presented discussion of "Planning and Using Swine Facilities" at Northern

Piedmont Area Development Association meeting in Greensboro.

Presented paper on "The Application of Air Conditioning in Farrowing Houses - A Progress Report" at Southeast Region, American Society of Agricultural Engineers, Memphis Tennessee.

Lectured to Poultry 402 class on housing and environment for poultry.

Lectured to Agricultural Engineering 481 class for two periods on structural design and planning of farm structures.

Accompanied students on two field trips to observe and discuss livestock and poultry production facilities.

Lectured to Poultry 52 class on housing and environment for three periods.

Presented seminar on poultry house environmental studies to Poultry Science faculty.

Serving as chairman of Publicity Committee for 1971 North Carolina Farm Materials Handling Exposition.

Served on departmental seminar, travel, telephone, and student recruitment committees.

Served on Swine Development Advisory Center Advisory Committee.