ANNUAL PROGRESS REPORT

EXTENSION POULTRY SCIENCE

July 1, 1975 - June 30, 1976

The general profitability of the broiler industry, has resulted in most firms updating their equipment, especially, trucks and processing equipment. Commercial egg and turkey producers have not had a good year for profit, and less modernizing of facilities has occurred.

In this report, highlights of progress will be presented. This will serve to show the scope of Extension activity and accomplishments.

Progress continued in the business management area. Four management training schools were held - three for industry and one for superintendents of the State Experiment stations. A total of 60 people completed these programs. The Extension Service assisted one poultry firm in a complete reorganization of the business structure and was able to assist in staffing several key positions with experienced and competent personnel. We assisted one firm in revising their records to adapt them to computer analysis. Business performance has improved.

A new financial management program is ready to offer to the poultry industry. This is a joint venture with Economics and Poultry Extension personnel.

We assisted one turkey hatchery in redesigning their hatchery for more adequate ventilation, isolation and work flow.

Waste management and the resulting impact on pollution has been a major thrust for the past year. As a member of the waste management committee, we assisted in revising the waste management program, EPA and N. C. regulations relating to pollution abatement. We have investigated all serious fly and

odor complaints arising from poultry operations. Extension Entomology specialists were most helpful with this undertaking. We were able to aid out-of-court settlements in some instances and in others it appears that some cases will have to be settled in court. In many cases, no substantial evidence was found to justify the complaint. Some egg producers have gone out of business as a result of pressure to control flies and odors. These efforts were undertaken with the full cooperation of the State Health Department.

Much work was done on an educational television program in waste management alternatives, however, due to technical problems and a redirection of the program, we have changed this to a slide tape program. This should be completed by the fall of 1976.

In the area of poultry housing, we were unable to get one turkey producer who built sixteen new turkey confinement houses, to adequately insulate, however, in most instances we have much better results with other poultrymen. One broiler firm who located in northeastern North Carolina about two years ago, has continued to expand and now has over 180 houses in the operation. He continues to press onward toward his goal of 330 houses. During the last year he has begun operations in his hatchery, feed mill and processing plant. We continue to aid this enterprise within the limitations of Extension Educational Policy.

We have received hundreds of requests for information on backyard flock management. All such requests were honored.

Extension personnel have conducted numerous radio and TV programs on various phases of management, consumption and economic outlook. Workshops and meetings on utilizing and preparation of poultry were conducted for Extension's clientele.

In September 1976, we will conduct a workshop for 25 Extension Agents on new technology in poultry production so that they will be better prepared to work with the poultry businessman.

Participation in the poultry youth program has been disappointing. A great deal of new project material was available, but little or no increase in participation was evident. We are currently searching for ideas to improve this situation.

Data acquired through hatchery surveys were analyzed and the economic opportunity for improved flock and hatchery management programs was calculated. Each participating hatchery was appraised of its relative standing and specific suggestions were made at points of greatest economic opportunity. Extension personnel prepared and presented training programs for breeder flock managers and hatchery personnel at four requesting hatcheries. We have responded to some requests for assessment of the results of management changes on hatching results. We have assisted the North American grandparent breeder of a European commercial-egg breeder in planning a production and distribution program.

We have continued work with pullet growers and have observed a substantial reduction of chick placement without firm pullet orders. Management programs have been refined and this change is reflected in pullet quality. We have encouraged frequent communication among pullet growers and believe that this has improved the stability of this segment of the poultry industry. The most serious quality defect of pullets which we see frequently is excessive debeaking. Growers are being encouraged to exert extra care in this operation.

The continued downward adjustment of flock size at both state and national levels and the feed cost relief due to the large grain crop in 1975 has kept central market egg prices at a level to provide a margin over production costs.

However, excessive price discounting and increased margins at each level between the producer and the consumer has absorbed an inordinate amount of quoted prices. In some markets, results of sample-grading have not been reflected in grade-yield payments; consequently, the opportunity for profit to the producer has been highly variable in North Carolina, depending upon specific market arrangements. We initiated a re-look at a market organization which was considered earlier but are awaiting indications of the effect of Eggmar before proceeding further.

We have encouraged egg producers to project opportunity on current and projected costs rather than historical costs and to adjust management at points where most substantial cost reductions can be obtained. We think we see improvement, especially in attention to feed usage and energy costs.

We completed and fully reported the 16th laying test. We completed the initial cage shape and crowding trials and gave a preliminary report at the Egg Industry Conference. We prepared abstracts for papers to be given at Poultry Science on cages vs. slat-litter housing effects, surgical alteration effects, and cage shape and crowding effects. We have feed density research in progress in conjunction with the current laying test and have designed trials for pullets that are now being grown to test combinations of cage shape, crowding, and toe amputation to determine if these effects are independent.

We worked closely with NCDA in completing plans and obtaining budgets for construction of controlled environment housing at the Piedmont Research Station.

There have been several significant and measurable benefits in the area of poultry health: The inauguration of medicated feed workshops held in

locations throughout the state. These one day workshops were held in cooperation with the North Carolina Department of Agriculture, USDA inspection service and the Food and Drug Administration. Latest information on drug usage, residue monitoring and feed mill inspection was given to the participants. An antigen and testing procedures were developed to test broiler breeder pullets for Infectious Bursal disease. This test determines the immune status of the parents and whether or not they require vaccination to eventually pass this immunity to their progeny to prevent gangrenous dermatitis. A total of 5,115 tests have been performed and this represents five million birds.

The use of the Hemorrhagic Enterities vaccine in turkeys has continued with over three million doses prepared for the turkey industry. The data on the isolation of the virus, preparation and administration of the vaccine is being gathered in conjunction with researchers at VPI in preparation of a paper to be published in Avian Diseases.

There has been a continuation of hatchery monitoring that was begun last year. This continues to yield information on the overall sanitation of the hatchery, eggs and injection of Marek's vaccine to chicks.

During the year numerous studies were conducted by Extension personnel at the research units in Raleigh. These involved nutrition, density, lighting regimes, and many other facets of management.

Two trials were conducted with turkeys involving light control and different floor densities. Another turkey trial involved different nutritional levels.

The cage layer house was used to conduct a trial involving calcium sources, and presently a trial involving three strains of layers and various nutritional

levels is in progress.

Three broiler nutrition experiments were conducted, and one project involved different methods of starting broilers.

In the area of broiler breeders an experiment on cocci-vac and a low level additive was completed, as well as, one test involving five nutritional levels. Pullets for replacement breeders were started and a study on male selection was initiated and is presently in progress.

Two forced molting experiments were conducted. Waste management research in cooperation with Ag Engineering continues.

Ingredient prices continue to be high and feed costs tend to make up an ever higher percentage of the total costs of producing poultry and poultry products.

We have continued to make improvement in feed costs per pound of broiler meat. Given below is an example of this improvement.

Results from Operation A	June 1975	June 1976
Average Weight of Birds	4.00	4.13
Feed Conversion	2.07	2.01
Feed Cost Per Pound of Meat in Cents	18.70	18.13

Results from Operation B	June 1975	June 1976
Average Weight of Birds	4.10	4.26
Feed Conversion	2.08	2.08
Feed Cost Per Pound of Meat in Cents	18.84	18.81

Savings in feed costs has been accomplished through improved management, genetics, although in one year this is hard to measure and changes in feeding programs tend to affect feed costs.

Emphasis this past year has been placed on the number of pounds of each feed being fed to birds. And in general a switch was made by decreasing the amount of starter by 0.5 pounds per bird and increasing the grower by a similar

amount. This has done two things to reduce the feed cost per pound of meat. Performance has improved and the total cost of feed has been reduced by using more pounds of the lower cost diet.

Another factor that has contributed to reduced feed costs has been an increase in awareness of the quality of ingredients, as measured by the number of assay reports that we have been getting. From January 1975 to July 1975 we received 3,235; July 1975 to January 1976 we received 6,449 and January 1976 to July 1976 we have received copies of 9,158 assay reports. This awareness has begun to show up in improved ingredient quality being used by poultry producers. For example, the average protein content of soybean meal has gone from 48.66% the last half of 1975 to 48.81% the first quarter of 1976 and 49.03% the second quarter of 1976.

The average moisture, insolubles and unsaponfiables content on fat has dropped from 5.06 percent since the program was initiated to 2.51 percent in the second quarter of 1976.

The above results are a direct result of Poultry Extension's Quality Assurance Program and represent a significant contribution to the poultry industry.

More screening of feed ingredients for pesticide contamination and aflatoxins is occurring.

Publication of quality data has appeared to improve the quality of ingredients markedly. Soybean meal fiber dropped from an average of 4.2% in 1974 to less than 3.3% in 1975; fat total fatty acids, moisture, insolubles, unsaponfiables, and the quality of several other ingredients is now much more predictable and of higher quality than they were in the past.

At the outset (January 1975) of the program, relatively few poultry firms in the state sampled and assayed their ingredients on a routine basis. Since

February, 1975, firms contracting with one laboratory in the state have increased from five to over thirty. While specific data from each lab are not available, feed manufacturers appear to have generally adopted this practice. Estimated direct savings from quality adjustments range from $30,000 to $70,000 per firm per year.

As the majority of North Carolina feed manufacturers adopt and use ingredient quality control measures, the emphasis of the Quality Control Program has been shifting to finished feed quality, and to detecting and correcting process and formulation errors Four in-depth mill profiles and studies were conducted in the past six months, and all disclosed major errors or discrepancies between formulated and actual nutrient levels in finished feeds. In some cases, formulation adjustments were made by J. B. Ward. In other cases, process errors were found (e.g. in metering, grinding, pelleting, etc.) that produced systematic and correctible discrepancies. In one case, incorrect metering of fat cost an estimated $7,000.00 per week in ingredient cost.

More companies have expressed interest in conducting intensive analyses of their milling operations, and in refining their quality control programs.

We worked closely with four companies on problems related to compliance with Federal GMP Regulations. Results of the program (actual inspections by FDA and NCDA) have found all firms we worked with to be in compliance. One firm was cited as an example for other companies to model their programs on. Drug residue violations in North Carolina have declined generally from 1974 and early 1975.

We are attempting to reduce the incidence of pesticide residue condemnations in North Carolina to zero. The approach we've used is to encourage

feed manufacturers to monitor high-risk (e.g. fat) ingredients for persistent chlorinated hydrocarbons on a routine basis, to evaluate their particular formulations, birds and ingredients, and to establish acceptable levels of pesticide in their feeds that will not accumulate to violable levels, and to communicate those acceptable levels to their ingredient suppliers. We also have encouraged the poultry industry to pre-test their flocks for pesticide residues well in advance of slaughter (e.g. four weeks), and to retain samples of all high risk ingredients until after the birds are inspected at slaughter. In terms of response, three firms that we know of have adopted these measures, and ingredient suppliers have expressed interest and concern, and have cooperated to insure that problem levels of pesticides are not sent to firms whose specific programs would put them at risk. FDA is now formulating a program of voluntary ingredient testing and flock pre-test such as we introduced in North Carolina. The number of pesticide screen results received by us has increased greatly in the past six months. Pesticide residue violations appear to be declining. Dr. Fred Tarver, Food Science, has expressed interest in co-sponsoring a pesticide education program for the poultry industry. One "Chickenfeed" and three presentations to the feed industry dealt with avoidance of pesticide residues.

Two studies in the area of turkey nutrition were intitiated and completed. The first study dealt with the efficacy and growth promoting qualities of two histamonostats, Carbarsone and Ipranidazole. Results of this study with 1200 large type turkeys show that both compounds were effective in preventing Histomoniasis, a common disease in turkeys. Both compounds also produced improved weight gains and feed efficiency. When compared to control birds, each histamonostat improved market weight by 1.5 lbs., and feed conversion by 15 points. This improved performance resulted in a net saving of $670.00 per

thousand birds.

The second study was conducted to determine performance and costs of production on two planes of nutrition. One series of diets was formulated by a commercial feed company to contain extremely high energy and protein levels. The other series of diets were formulated by N.C.S.U. to a lower energy and protein level. Results of this study show that the NCSU formulated diets reduced total production costs by 1.7¢/lb. of live weight, or .37¢/bird. One company, Carroll's of Warsaw, changed from the commercial to the NCSU formulated diets and will realize a net savings in excess of $700,000.00 on 45,000,000 lbs. of turkey produced annually.

In the area of breeder management, we have encouraged greater investment in modern confinement and semi-confinement housing facilities. This has resulted in improved performance in terms of numbers of hatching eggs and in poult quality. Diamond Farms, Goldsboro, completed a breeder flock record (6,000 hens) with a total of 195 settable eggs -- 100 in the initial production period and 95 additional eggs after the hens were force-molted.

We continued to emphasize turkey hatchery management, particularly, sanitation and monitoring for bacterial and mold contamination. Results of these efforts are evident. Cuddy Farms, Union County, hatch records, October 1975 - June 1976 show a hatch rate of 77% of all eggs set. This is approximately, 12% above the national average, and results in 62 poults per hen as compared to a national average of 52.

APPENDIX

A field test was conducted in an integrated broiler operation comparing Extension recommended feed formulas for broilers with feed from a national brand commercial feed company.

The operation produced 250,000 broilers per week. Fifty thousand broilers per week for eight weeks were placed on formulas as recommended by Extension. The remaining 200,000 broilers were left on the commercial feed. Weights, feed conversion and feed cost per pound of line weight for the eight weeks are compared below.

TEST WEEK	COMMERCIAL Weight	COMMERCIAL Conversion	COMMERCIAL Cost	EXTENSION Weight	EXTENSION Conversion	EXTENSION Cost
1	4.14	1.92	$ .1785	4.04	2.07	$ .1768
2	4.21	1.96	.1823	4.12	2.07	.1767
3	4.10	1.98	.1839	4.07	2.07	.1769
4	4.08	1.98	.1827	4.24	2.01	.1734
5	4.06	1.96	.1795	4.01	2.06	.1744
6	4.04	1.99	.1793	3.93	2.00	.1699
7	4.04	1.97	.1760	3.97	2.01	.1681
8	4.09	2.13	.1861	4.15	2.16	.1762

If we take the least difference in feed cost per pound of meat (which occurred during Week One), the savings in feed costs for 250,000 birds would have amounted to $1717.00 per week.

If we take the greatest difference in feed costs per pound of meat (which occurred during Week Eight), the savings in feed costs for 250,000 birds would have amounted to $10,000.00 per week.

At the conclusion of the trial at eight weeks all birds were placed on Extension recommended formulas.

The trial itself saved the company the following amounts in feed costs each week for a total of $11,384.00.

Week	Savings
1	$ 343.00
2	1,154.00
3	1,424.00
4	1,972.00
5	1,022.00
6	1,847.00
7	1,568.00
8	2,054.00

Appendix