POULTRY PROGRESS IN MINNESOTA

- Extension Work
- History of Poultry Production

by Cora Cooke
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EXTENSION WORK

The story of poultry Extension work in Minnesota may well typify Extension work as a whole. The short life span of the chicken, which makes possible more rapid shifts in technology and in the relative position of the enterprise, may have condensed remarkable changes into a shorter period of time than in most other fields. For this reason the Extension program in poultry has probably suffered all the vicissitudes and used all the devices that might characterize the entire program. Few fields of subject matter represent the joint interest of farm men and women as does the poultry enterprise. Few enterprises have to so great an extent moved from the position of a "pin money" operation for farm women exclusively to that of a major livestock enterprise participated in by both men and women together or singly.

The first poultry Extension specialist in Minnesota began work in 1912.

Personnel

1912 - 26  N. E. Chapman
1929      F. B. Hutt - half-time
1921 - 58  Cora Cooke

For a few years beginning in 1926 an extra person was engaged to handle Institute meetings during the winter; among them were Dwight Lane, Dr. George Ghostley, and Thomas Canfield, Jr.

Since 1930 a marketing specialist has assumed major responsibility in marketing. In the field of poultry-house construction, the major responsibility has been assumed by the Agricultural Engineer since 1944.

The official appointment of the poultry specialist on the Home Demonstration staff continued until 1945. However, the specialist was given direction of the entire program on a broader scale from 1937 to 1940 in response to insistent demands of county agents. In 1940 the specialist was assigned to the over-all program of poultry production for war needs, responsible to the director. In 1945 the separation from the Home Demonstration program was made official.

EARLY WORK IN POULTRY

The earliest attempts at Extension work in poultry were made through the medium of the Farmers' Institutes. The first Minnesota Farmers' Institute Annual, published in 1888, carried an article by W. A. Gates, President of the State Poultry Association, covering housing, feeding, breeds, and suggestions on how to get started in raising chickens. A strong plea was made for pure breeds, which were classified as meat breeds, egg breeds, and dual-purpose breeds or "farm fowl," these last being recommended for farm flocks. Wheat was listed as the preferred grain, with meat, presumably fresh, twice a week. Other feeds recommended were old plaster, lime, granulated bone, and crushed oyster shell, with cabbage hung high to induce exercise.
For several years following, the poultry articles were in the main reprints from farm magazines. Ideas expressed were mostly opinions of the person writing the article. Chickens were admitted to be scavengers, and a winter "hibernation" was expected. Cooking of feed in winter was regularly recommended, usually a mixture of grains and potatoes or other vegetables.

It is not until 1895 that there is evidence of a speaker on poultry at the Institutes. In this case it was Mrs. Ida Tilson, West Salem, Wisconsin, who had had a considerable success with her flock and who for some years continued as the authority.

In 1900 appears the first mention of beef scrap or animal meal listed among the ingredients of a mash used by a poultry raiser in Cobleskill, New York.

Several other "firsts" appear in this article. The house, which was 15 feet x 367 feet, cared for a much larger flock than had previously been considered possible. A wall insulated with a fill of swale hay, droppings boards, and a forced molt were all quite advanced ideas which became general practice at a much later date.

Meanwhile some attention was being given to poultry at the University of Minnesota. The first poultry house was built in 1898, housing four breeds, Barred Plymouth Rocks, Rose Comb Leghorns, Light Brahmäs, and Cochins. Two incubators were installed and experiments were begun. Those listed were: feeding for egg production; preserving eggs; incubation and brooding; and crossing of breeds.

These were days when the emphasis was on the opportunities in production for sale, hitherto unrealized, rather than on production mainly as a family food. In the 1898 issue of the Institute Annual the Secretary of Agriculture called attention to such opportunities by reporting the importation in 1896 of 1,000,000 dozen eggs, 132,000 dozen from China. Small successes of individuals were reported as evidence of the possible profit, even though information on how it was to be accomplished was very meager. The 1898 issue told of a woman who traded a hog's head for a rooster and pullet and had another pullet given her. In one year she increased her flock to 18 hens and had sold 145 chickens and 1,000 eggs.

In 1903 James E. Rice, then a poultry raiser at Yorktown, New York, and later the first head of the Poultry Department at Cornell University, was the visiting lecturer. It is of interest that the ration he recommended was identical with an all-purpose ration used in a Minnesota Extension folder in 1940, the single additional ingredient being cod-liver oil.

The poultry department at the University of Minnesota got its start when A. C. Smith was appointed Professor of Poultry Husbandry in 1912. At about the same time N. E. Chapman came to the University as Poultry Expert in the Extension Division. The Institute Annual for 1911, apparently issued the following year, offers his services to groups wishing to arrange for Poultry Schools.
During the years of World War I a U. S. Government employee spent some time in the state, devoting his efforts to urging people to produce poultry and eggs to the extent of their ability as a source of food for their own use.

The only article on poultry which appeared in an Institute Annual during the war period emphasized the difficulty of keeping poultry because of the shortage of grain. It was suggested that even table scraps would probably be less abundant. While the use of bran was recommended as being lower in price than any of the grains, it was suggested that not much hope could be expected for poultry and egg production in increasing food production.

While the exact nature of the poultry Extension work immediately following World War I was not clearly documented, it is of interest that considerable emphasis was placed on poultry shows, a movement considered significant enough to warrant the following item in the 1919 annual report of the Director of Extension: "Poultry association organized - 63 counties now on the list to receive $400 (from state appropriations) for premiums at county poultry shows." The reports indicate that promotion of poultry raising received major attention and that the new art of culling was given great emphasis.

From 1920 on, poultry shows were of significance to Extension only as a medium for educational programs. In some cases this took the form of utility poultry classes. By 1957 exhibition poultry had so far retreated from concern for practical poultry raisers that a class of 4-H poultry project members could not identify a picture of the show-type Single Comb White Leghorn which in earlier years had been considered the standard for all breeders. This was true in spite of the fact that in Minnesota today White Leghorns predominate, constituting more than half of the chickens in flocks supplying the hatcheries operating under supervision of the Minnesota Poultry Improvement Board.

Specialist in Home Demonstration Office

Minnesota in 1920 adopted a unique position, at least among the northern states, in establishing the poultry project as a function of the Home Demonstration office, with a specialist added to work with organized groups of women. There seems little doubt that this was a wise decision. The poultry flock was almost universally the project of the farm woman. She needed and eagerly responded to the help and encouragement thus provided. Moreover she was in all probability best adapted, psychologically, to the type of group instruction, demonstration, and leadership work that made possible a widespread program intended for every family. Above all she wanted her flock to contribute to the family income. She had confidence in its ability to do so. With few exceptions the farmer himself took the opposite view, offering resistance rather than wholehearted acceptance.

The Beginnings

The work was started under the most primitive conditions. Practically every farm had chickens, but they were nondescript as to breeding, per-
formance, and age. The 1920 report of the specialist in the Home Demonstration office carried the comment, "A great deal of the stock on Minnesota farms does not deserve housing and feeding." Egg production was confined to the spring and summer months. True, there were a few scattered flocks being handled on a more scientific basis, but so few farmers had an opportunity to know of such flocks that they were of value primarily as a source of information and inspiration to the specialist to pass on as effectively as possible.

The early efforts to capitalize upon the value of group meetings in Extension work for women were hampered by lack of previous experience with such meetings, especially when they were held outside the immediate neighborhood. Women were not accustomed to being away from home. They did not drive cars. The idea of leadership training was just emerging. Local leaders were often selected as much for their bravery in driving cars as for recognized leadership ability or knowledge of poultry.

Consequently appeals had to be made to every human emotion to assure attendance. Among them were promises of:

1. Year-round supply and income.

   This met with much skepticism. Every step had to be demonstrated locally. Daily egg records were encouraged, to be compared at subsequent meetings. Short-time demonstrations with records were established, a minimum number for each group. A one-month feeding demonstration with records of production, costs, and returns proved of value when reported at a group meeting--if it showed a profit. To be convincing these had to be confined to pullet flocks at the time of year when production would normally rise if proper feeding and care were provided.

2. Sociability.

   This played a very important role at a time when means of communication were limited. The women enjoyed getting together--in their own neighborhood and later with women from other neighborhoods. They enjoyed the sociability of a group lunch, often carefully planned and served by a special committee.

   Recreation proved to be a factor in assuring continuance of the group. Games, especially of a type suitable to family or 4-H Club use, were keenly enjoyed. A music-appreciation program, carried on for several years as a recess activity under the guidance of the Victor Talking Machine Company, was an especially successful answer to this need for sociability and just plain fun.

   Achievement Days brought project members and others together on a county-wide basis. Dramatization of the project by means of exhibits and skits probably had fully as much social value as educational value.

3. Appeal to thrift.

   Wherever possible it was necessary to show how materials at hand could be utilized, or how needed equipment could be built at small cost.
For all the years of organized project work, the building of feeders for chicks, young stock, and layers was a highly important activity of each project group, first at the leader meeting, then at local meetings. This, in turn, assured a steady approach to the goal of having enough feeders for good performance with a slowly developing appreciation of the need. The use of homemixed rations met with wholehearted approval wherever economies could be affected.

A discarded bedspring put to use as the floor of a sun porch demonstrated the principle of sanitation as well as new wire could have done.

4. Prestige.

Selection as a local leader, demonstrator, or performer at Achievement Day frequently met with some reluctance, but it also had its prestige value if properly exploited. It became a common practice to honor leaders at the final meeting of a project.

Competition was used to exploit the prestige factor. Competition among individuals on production and returns, among groups on attendance and participation, and even between counties for such things as attendance at Achievement Days played a significant role.

The prestige value of fulfilling an obligation to neighbors, to the county, and to the Extension Service had its effect on many leaders and group members.

Training in news reporting, with the responsibility of reporting meetings regularly delegated to one member of the group, served to keep the names of active members before the public, providing personal satisfaction while at the same time bringing Extension work more and more into the public consciousness.

The woman who, with good flock management and carefully kept records, could receive from her husband public acknowledgement of the profitableness of a well-managed flock was inclined to feel she had reached the summit in prestige. Her somewhat rueful remark that "my" flock became "our" flock and eventually "his" flock was not without personal satisfaction on her part.

Major Devices Recur

The changing character of the industry has made it necessary to vary the approach from time to time, with a recurring use of "showing how," demonstration, and implementation.

People could be "shown how" to cull in a short session with opportunity to handle a few birds. This new culling technique had the appeal of magic and proved a sure means of attracting attendance. The accuracy of the selection could be "demonstrated" in a few days by keeping the culls separate from the rest of the flock. "Implementation" was sometimes used in arranging with local buyers to buy the birds at a slight premium during a short-time campaign of culling.
Demonstrations

One of the most dramatic demonstrations was in the use of cod-liver oil, which enabled people to observe in a few days' time the complete recovery and return to laying of birds that were completely paralyzed and might otherwise have died of starvation or from injury by other birds.

A series of demonstrations conducted in Blue Earth County in 1926 is significant primarily because it illustrates the opportunity frequently encountered in Extension work to capitalize on a local situation favorable to the demonstration at a particular time. This was a series of housing demonstrations used as a follow-up of a very successful local leader project. Group members in each of the three training centers were brought together to participate in a building "bee." Two houses were remodeled and one new house was built. So successful were the results that the houses served as demonstrations for many years. The effect was particularly dramatic in the case of the new house. It was built on the farm of a very outspoken community leader, who felt that his hand had been forced into agreeing to this demonstration on his farm. Following his threat to "expose" the whole Extension Service if the house fell short of expectations, his public admission that it was "the best move he ever made" proved to be a strong selling point for Extension work at a time when it needed support.

Tours were one of the best devices at the beginning of the program in furnishing the opportunity to observe house construction and arrangement, equipment, feeding methods, and general management. Perhaps as much as anything, they brought to many men, for the first time, a realization of the opportunities in a well-managed flock. Its use had to be discontinued because of the danger of spread of disease. This had presented a real handicap in keeping producers informed as to newer methods. The practice of confinement of layers and, more recently, the trend toward larger-size flocks, both more or less hidden from public view, could have been greatly speeded up if it had been feasible to continue holding tours. Slides and films had to be used as a not-too-successful substitute.

Implementation

Successful adoption of practices did not depend entirely on individual desire. Meat scrap, cod-liver oil, and steel-cut oats could not be fed if they were not available locally. Someone--county agent, group member, specialist--had to see that local feed men were informed that a potential demand existed. Lumber dealers were encouraged to stock bundles of pre-cut material for feeders to facilitate the goal of getting feeders installed. It was good publicity for the project and for Extension when people commented that they could tell when it was poultry-meeting day by the bundles of lumber tied to the sides of homeward-bound cars. Such comment no doubt fostered the "spread of influence" which is a powerful if intangible force in Extension.

Implementation has continued to be an important device in securing necessary services to poultry raisers, in utilizing as far as possible the informed services of the hatchery, feed, lumber, and processing industries,
and in working closely with the state and federal regulatory bodies to secure laws and regulations which would encourage producers to move in the right direction.

Implementation may now offer the best hope for achieving results in the improvement of egg quality, which is, without doubt, the biggest single problem facing the industry. It seems likely that working with egg buyers to modernize buying and merchandising practices might be much more fruitful than programs for producers alone.

Methods of Operation

The Local-Leader Method

After two years when most of the work was conducted with community groups, the major project work (from 1922 until 1939) was carried on with local-leader groups. By 1939 some sort of countywide poultry project had been carried on in 77 of the 90 county units as then organized for Extension work. Poultry was unimportant in some of the counties not covered. In many of the others there was no county agent during much of that period.

Under the conditions existing, and judging from later developments, it seems likely that the local-leader program did more to establish practical poultry husbandry than would have been possible under any other circumstances. Membership in the project groups, together with others reported as helped in some way by project members, frequently constituted better than one-fourth of the farm families in the county. This meant that the basic practices were established in all parts of the county, and the spread of influence could be rapid from that time on. It even seems likely that the poultry project may have made an especially strong contribution to the development of local leadership. Confidence that developed in leadership dealing with a project that touched the family income so closely and where results were so easy to see might be expected to have a strong carry-over into other fields.

The part played by the county agricultural agent in this early development cannot be overemphasized. While counties employing home agents were generally given preference in the allocation of the specialist's time, the poultry project frequently became the opening wedge in creating a demand for other home project work, leading inevitably to demands for a full-time home agent to help the farm women with their many problems. Out of the 70 counties where leader projects were carried on, only 16 had home agents, and in some of these a previous poultry project had been organized by the agricultural agent.

The main strong points of this local leader approach to poultry raising appear to be:

1. Emphasis on the elementary principles of poultry management.
2. Demonstration on many farms of results to be obtained from use of these basic practices.
3. A series of meetings which offered opportunities to report and compare results and to raise questions on individual problems.

4. Emphasis on best use of facilities at hand to develop a sound success with the current flock before attempting to expand the business.

5. Emphasis on homemade equipment and use of homegrown feed as far as feasible.

When the local-leader projects underway had to be closed in 1940 to release time for defense activities, this method had just about run its course. It had served an extremely useful purpose in getting basic practices established in an enterprise that was of almost universal interest to farm families. From there on, such had been the varying rates at which farm families had exploited the potentialities of the enterprise, there might not again be a sufficient universality of problems to warrant the time required for organizing and conducting a local-leader program. There was one exception to this. With the onset of World War II, the method was picked up again to provide quick statewide coverage with a program of rapid expansion and efficient management for the sole purpose of increasing food production as rapidly as possible.

During the period when the local leader project was the major activity there were always supplementary programs underway.

Record Flocks

One of the most useful of these was the Record Flock Project, which for 30 years was, more than anything else, a source of information to support the regular teaching material. It served also to establish the habit of keeping and studying records both directly and indirectly. It started as an egg-laying contest organized on a county basis, but this method was soon abandoned in favor of complete records to help establish a basis for expected production, costs, and returns. Three annual summaries were published for general distribution, and cooperators were provided, each year, with analyses of their own businesses and of the records as a whole.

The project was organized on the basis of a maximum of three cooperators per county, with enrollment and collection of monthly records the responsibility of the County Agent and the summary and analysis handled by the specialist. A monthly news letter (later bimonthly) was sent to each cooperator, who was also supplied with the annual reports as previously indicated.

At the time that the project was dropped in 1952 it was felt that it too had served its purpose, although the primary factor in its discontinuance was lack of time for supervision. It is possible that such a project might be revived with considerable benefit, especially in view of the rapid changes the industry has undergone in recent years.
General Meetings

Throughout the period, meetings of a general nature provided an opportunity to bring the poultry-management story to many people who were not sufficiently interested to enroll in a project. Farmers' Clubs, Farm Bureau units, annual creamery meetings, and Farmers Institutes were of chief importance in this category. It was early established as a general rule that the specialist would be available for general meetings only to appear before the entire group rather than in a separate meeting for women. This was considered an important means of securing the attention of men to the important position of the farm flock and of making them aware of the part they must play if its full potential were to be realized. This point was also a factor in scheduling one open meeting as a regular feature of some of the later local-leader projects, to which both men and women, nonmembers as well as members, were invited. These open meetings served another purpose, that of responding to the repeated requests that project members have some direct contact with the specialist.

From time to time, as conditions changed, special projects were conducted to help in the solution of a specific problem.

Sanitation in Chick Rearing

The rapid increase in the size of flocks on many farms brought with it serious losses from disease brought on by repeated use of the same yards for raising chicks. In 1928 a Sanitation Project was set up to bring this problem and its solution into focus. This was conducted as demonstrations set up in various parts of a county, usually on a community basis, with enrolled demonstrators who agreed to follow the various steps in the program and keep records. Others were enrolled as cooperators, as members of the group but without responsibility for keeping records. Two or three field meetings were held in each community during the chick-rearing season to observe and discuss practices followed and results obtained. A tour in the fall served as a result demonstration for the season's work. Of particular interest, aside from establishing the use of clean ground as a disease-control measure, was a growing awareness of the type of equipment necessary to save labor in caring for a flock on range. A monthly news letter to demonstrators and cooperators served as a reminder of timely problems and practices.

Cooperators in this project quickly became aware of their influence on other producers, brought about by the fact that the flock on range was readily seen by passers-by. Cooperators frequently commented that, while the actual enrollment in their neighborhood was small, the evidence of its influence could be seen on farm after farm where brooder houses and young stock had been moved out to range, away from the old flock and old yards.

The Sanitation Project was carried on a seven-year period in about half the counties, most of them in areas where poultry production was carried on most intensively and where the problem of disease was greatest.

The practice of controlling filth diseases by sanitation became well established. It was noticeable, however, that cooperators more often gave the
credit to a feed formula that could be mixed at home and to more generous feeder space than to the sanitation feature itself. This was understandable in view of the fact that this program reached its height during the depression years when even small savings in cost were appreciated.

There were also some side effects which formed the basis for other improvements. Some laying flocks were kept confined as the best means of avoiding contact between chicks and hens. The increased egg production and the improved flavor of eggs noted by these cooperators gave year-round confinement of layers its first real impetus.

Another side effect was appreciation of the role of ample feeder space and comfortable houses in the control of cannibalism, which was just beginning to be a problem.

Publications

Throughout the formative period of the poultry Extension program much reliance was placed on bulletins to provide information on a great variety of subjects, including housing, chick rearing, brooder houses, equipment, diseases, culling, and feeding. Accepted practices were covered in detail, even to such seemingly minor points as training chicks to eat and to roost. The rules laid down had to be specific. By about the beginning of World War II the general rules were sufficiently well established so that brief pamphlets covering new practices began to replace the bulletin for most purposes. Principal subjects among these were built-up litter, community nests, culling, and range shelters.

Related Problems

During this formative period of the poultry industry there was no effective program of disease control or marketing. Both were problems which could be given only minor attention as part of the major problem of establishing efficient production practices.

Disease

Tuberculosis was the number-one disease problem at the beginning of the poultry expansion program. This was due in part to lack of familiarity with the disease and partly to the practice of keeping birds to a considerable age. Post-mortem examinations were a regular feature of poultry meetings. Care had to be taken to avoid incorrect diagnosis. The easy identification of tuberculosis served to bring recognition of the disease and its widespread occurrence and to demonstrate safe methods of slaughter and disposal, with information on practical clean-up methods.

Culling demonstrations were probably the strongest single factor in bringing the TB problem to the attention of poultry raisers while, at the same time, eliminating many of the most badly affected birds. In turn, reducing the number of old birds to be kept made it more likely that young
replacements would be produced, resulting in a lower incidence of the disease. Tuberculosis as a problem of poultry raising is today practically non-existent.

A survey project that was carried on from 1944 to 1946 is of interest in this connection. It developed as an attempt to determine the relationship between the age and management of the poultry flock and the incidence of avian tuberculosis in swine.

The study consisted of a survey of poultry and swine management on the farms in Alden and Hartland townships in Freeborn County, combined with reports of hog retentions at the local packing plant, culling of all flocks, tuberculin-testing of selected flocks and herds, and laboratory examination of suspicious glandular lesions of hogs.

The project was planned by a committee representing the Poultry Division, Extension Division, and Veterinary Division of the University of Minnesota, the Minnesota Livestock Sanitary Board, and the Federal Bureau of Animal Industry. Cooperating in the execution of the project were, in addition, Wilson and Company, Land O' Lakes Creamery in Albert Lea, and the Lanesboro Produce Company in Wells.

The study brought out no new methods of control but did confirm some points that had long been in question:

1. That tuberculosis in poultry had diminished to a point where it was of little importance to the poultry raiser.

2. That there was only a slight relationship between age of birds and incidence of tuberculosis in swine on the same farm.

3. That confinement of layers was a more important factor in control of the disease in swine than was age of birds.

4. That other factors in management seemed to be more important as control measures that either age or confinement of birds.

From time to time new disease problems arose. Brooder pneumonia and fowl pox reached almost epidemic proportions on different occasions. The leukosis complex caused serious losses over a period of years. Cannibalism became a problem. Extension had no program and little information. Surveys made by the specialist attempted to determine the extent of the problem in each case and recommendations were made to try to minimize losses. In the last analysis veterinary science had to be depended upon to develop the long-time program.

In the meantime emphasis was placed on good husbandry to reduce avoidable losses.

**Marketing**

From the beginning the marketing of eggs was considered a problem deserving the attention of Extension. In the early 1920's, encouraged by the
Barnum Program, small groups of producers were assisted in setting up organizations for the marketing of their eggs. Two such groups, one a group of World War I veterans in Orchard Gardens and one in Kingston, found that the mechanics of assembling and marketing eggs in small volume did not prove practical.

Marketing as Part of Projects

With practically no quality outlets or grade buying, the early work in marketing was confined to teaching recognition of differences in quality and condition and the practices involved in producing and maintaining good quality. Group members were invited to bring their eggs to a meeting where they were taught to grade them for quality and size. In some cases a group packed a 30-dozen case of eggs so graded, which were shipped to a selected grocery. While this never resulted in any organized plan for continued shipment, the reports from the shipments served to demonstrate the consumer's response to high-quality eggs when they were available.

Another teaching device used was that of demonstrating differences in quality, by candling and by breaking of samples of eggs that had been held at different temperatures for varying lengths of time. In these demonstrations it was also possible to show the effects of fertility on keeping quality and the differences in color of the yolk between eggs produced on range and those produced in confinement.

Egg shows were used as early as 1925 in this attempt to focus attention on quality in eggs. Usually these egg shows were staged as part of the final meeting of a countywide project.

By the time grade outlets developed there were some people in most areas who knew what was required and who were able to take advantage of the new opportunity. This no doubt contributed to the speed with which grade buying was adopted by buyers and the rapid progress made in the Federal-State grading program. For the past several years the volume of eggs bought under Federal-State grading in Minnesota exceeded that of any other state.

One of Extension's contributions during this period was the encouragement of a practicable grading system and of laws and regulations that would be enforceable, while at the same time providing for steady improvement in the quality of eggs marketed.

The War Period

The poultry industry grew gradually from about 13 million hens in 1920 to about 16 million in 1930, levelling off at about that point through the depression years. Most farms still had chickens and there had been a very slight increase in the average size of flock.

However, the foundations had been laid, in a widespread familiarity with the basic principles. Moreover, the use of local leaders had been well established. This situation may be a partial explanation of the fact that in the
period from 1940 to 1944 Minnesota made a far greater percentage increase in volume (80 percent) of eggs produced than any other state and that only one state equalled Minnesota's record in increased rate of lay (26 eggs per hen).

With the urgent need to increase egg production the local leader plan was pressed into use to carry on a statewide program.

As the threat of American involvement in the war became greater each day, it became clear that it was the poultry enterprise that could make the most immediate contribution to stepped-up food production for war needs, with egg production requiring major emphasis.

The local-leader method was decided upon as a means of reaching large numbers of poultry raisers in a short time. Three county agents, Carl Ash, M. L. Armour, and D. T. Gruessendorf, were drafted for short periods to assist in conducting local-leader training meetings in two series, one in the fall of 1941 and the other in the following spring. The fall series emphasized methods of increasing egg production from the birds on hand, while the spring series dealt with means of increasing poultry population and of improving efficiency in rearing.

It was recognized that any program based on a single meeting would need to be extremely simple and should cover only such practices as were immediately feasible for most poultry raisers and which would, moreover, be likely to bring the most prompt results. Lack of adequate feeder space was felt to be the greatest deterrent to rapid increase in production. It was also agreed that if this handicap could be quickly overcome, the increased production that would be felt immediately (at this particular time of year) would offer sufficient encouragement to carry forward the increased production that was needed.

The fall program, therefore, was tied to having each leader group and each local group build a simple feeder for laying mash, as the basis for discussion.

This extremely simple solution to a complex problem paid off well beyond expectations. Reports from counties indicated overwhelmingly that this simple demonstration brought immediate response and enthusiasm. Certainly the rapid upswing in production provided evidence that ensuing action was prompt and positive.

A similarly simple program was adopted for the spring series with emphasis on sanitation in rearing and methods of housing the enlarged flock. All but two counties participated in one series or the other with the greatest participation in the fall series.

Several other developments of previous years proved to be a valuable asset in this emergency period.
The Poultry Husbandry Division of the University

It was at this time that the impact of the resident division had begun to be felt under the guidance of Dr. H. J. Sloan, not only in much needed research and teaching but also in leadership to a growing industry. Recognizing this leadership, the trade groups which service the industry promptly offered their assistance in securing much-needed facilities for teaching and research.

Work with Commercial Agencies

For many years, as opportunities arose, contact had been made by the specialist with local and statewide groups that serviced the poultry industry. This had been particularly effective in working with lumber dealers, who from time to time were supplied with new or revised plans of poultry houses, brooder houses, and equipment. The Northwest Lumber Dealers Association had cooperated in the mailing of these blueprints.

Local lumber dealers had been called upon to supply bundles of material for feeders and had helped to promote a satisfactory feeder by building them for sale.

Work with hatcheries had consisted mainly in interpreting to producers the National Poultry Improvement Plan. The purpose was to assure producers of the availability locally of high-quality chicks and to discourage long-distance shipment with its hazards to health and livability. Assistance had been given to the state hatchery association in the planning and execution of programs for the betterment of the industry.

Work with Poultry Industry Council

Both Extension and resident divisions were active in the original formation of the Poultry Industry Committee and continued to assist in its activities. The specialist served as Secretary-Treasurer until 1954.

A particularly important activity, initiated by the feed industry and carried out with the support of the Industry Committee, was the preparation and distribution during the early days of World War II of three pamphlets aimed at three major problems of the period. "Help Save Three Million Chicks," "Two Eggs for Every Pound of Feed," and "Now You Can Spot the Loafer Hen," were prepared by Extension and published under the Extension imprint. They reached a tremendous circulation in the hands of industry groups all over the state; nearly a million copies were purchased for local distribution. In the case of "Now You Can Spot the Loafer Hen," only this industry cooperation made it possible for Extension to have a pamphlet in full color, so effective that it was widely copied and was even reprinted in whole or in part by at least three state Extension Services.

It was indicative of the mutual confidence that had been built up between Extension and industry that industry groups specifically asked that no space be left for individual concerns to imprint their names.
As an outgrowth of this activity, the specialist was consulted on many occasions throughout the war period in regard to recommendations to be presented through advertising material. It was gratifying to note in this critical period that poultry raisers were not being confused by recommendations from manufacturers that were in conflict with University recommendations.

Wartime Shortages

The need for greatly accelerated food production called for programs to deal with two areas of greatest shortages, labor and feeds, particularly protein feeds.

Labor -- Two laborsaving practices which became well established during this period were use of built-up litter and free-choice feeding of concentrates and whole grain. Use of built-up litter was not generally successful and brought on bitter controversy during the time when its use was encouraged as a much-needed laborsaver. However, so great was the labor shortage that it persisted in the hands of some producers, with constantly increasing knowledge of the principles involved and therefore greater success and increasing adoption.

A special Extension program directed at laborsaving was conducted by the Extension agricultural engineers in consultation with the poultry specialist to provide more laborsaving equipment. Lumberyard meetings were held throughout the state at which farmers could build equipment for their own use and lumber dealers received help and plans for equipment to be built for sale. Feeders, water stands, and brooder houses received particular attention.

Feeds -- As mentioned earlier, Extension's wartime program was, from the beginning, predicated on the theory that having enough feeders was the first essential to a rapid increase in production. It was felt that use of the right kinds of feed would sell itself once the flocks were supplied with ample feeder space.

Feed shortages were somewhat harder to deal with. Demand skyrocketed due to government action, which offered producers incentives in the form of very attractive floor prices on poultry products and ceilings on protein feeds.

However, with strict control of protein feeds and with the cooperation of research workers and the feed industry, the scarce animal proteins were distributed for most economical use, and means were developed for supplementing vegetable proteins in poultry feeding for more efficient use.

Free-Choice Feeding -- Efforts toward equitable distribution of protein feed placed the heaviest responsibility on the feed industry, which resulted in distribution mainly through mixed feeds. For grain producers in Minnesota this led naturally to a greatly increased use of free-choice feeding of high-protein supplements and home-grown grain. It answered the need for both laborsaving and feed saving.
As producers saw their rates of production skyrocket, the lesson of well-balanced rations and adequate feeder space made a permanent impression. This was the period that developed, among farmers generally, a profound respect for research and gave impetus to a spiral of improvement in management which covered all of its phases and which still continues.

Feed-Dealer Meetings -- The poultry specialist worked with livestock specialists in dairy and animal husbandry in conducting schools for feed dealers throughout the state. Discussion centered around problems of distribution and of formulation of adequate rations with available ingredients. Latest research that might have a bearing on the problem was emphasized. These discussions were reinforced with brief folders on pertinent subjects for distribution to producers. The local feed dealer was thus put in a position of greatly implementing the wartime goal of increased food production with economy and efficiency.

An outgrowth of this program for feed dealers was the Minnesota Feed Service, published quarterly since 1952 as a special service to local feed and fertilizer dealers.

Other Shortages -- Shortages of fuel and steel handicapped the poultry industry at this time. Extension played its part in this field by giving information to the War Production Board on needs and in helping producers make the best use of materials at hand.

Postwar Adjustment

The poultry industry in Minnesota made a spectacular growth during the war years. Hen numbers reached a peak of nearly 31 million in 1944—an increase since 1940 of 57 percent, compared with a 33 percent increase for the entire country. Production per hen increased from 135 eggs in 1940 to 161 in 1944—compared with the national increase from 134 to 148 for the same period. The state moved into second place in 1942 in total eggs produced, although third in number of hens.

With the ever-increasing rate of lay that was being achieved and with the return of more-normal supplies of meats for civilian consumption, it was recognized that considerable reduction in the size of the business would be required if supplies were not to outrun the foreseeable demand. A feature article, "Poultry Miracle in Minnesota," in the Poultry Tribune in May 1946 called attention to this problem, showed that the reduction was already well underway, particularly in the North Central states, but that Minnesota had shown a much lower rate of reduction.

The job of Extension was to develop programs that would minimize the effects of necessary reduction and also reduce the extent of it so far as possible. To this end the postwar programs were directed at:

1. Increased efficiency of production to reduce costs.
2. Increased use of laborsaving practices.
3. Improvement of egg quality as a means of holding egg-consumption levels as high as possible.

Specific programs in the years immediately following the war were:

1. Culling campaign - 1946
2. Feed-saving program - 1947
3. Farm Labor Caravan - 1947
4. Dairy-Poultry Caravan - 1949

All of these programs were directed at the postwar adjustment. This involved the downward adjustment of numbers of chickens in the face of expected reduced demand, coupled with the greatly increased rate of lay. It also involved the need for feed conservation to supply requirements for the rehabilitation of European countries.

The culling campaign of 1946 and the feed-saving program of 1947 were part of a national program directed at these problems.

At the same time there still existed a marked shortage of labor and there was evidence of a trend toward greater specialization on farms if labor-saving practices could be made to function for increased efficiency.

**Caravans**

The Farm Labor Caravan in 1947 and the Dairy-Poultry Caravan in 1949 concentrated attention on this problem and the factors in its solution. The practices selected for emphasis were those that involved only minor capital expenditures: built-up litter; droppings pits; community nests; and house construction of a sort that would maintain good conditions without excessive labor requirements.

The quality of eggs marketed appeared to be an increasingly important factor in the ability of the state to maintain its strong position as a poultry state. The theme of the Caravan exhibit was egg quality, with laborsaving practices emphasized as the best support of this over-all goal.

These travelling shows were no doubt of great value, at that time, in the wide dissemination quickly of information on new practices which it was expected would greatly influence the future trend of the poultry business on farms.

The total audience of the Dairy-Poultry Caravan was 77,000, who not only saw exhibits portraying practices but who also had a chance to discuss with the specialists their own problems in the use of these devices.
Egg Institutes

In the meantime, the importance of egg quality to the continuance of the poultry business as a major source of farm income was receiving serious attention.

From time to time the specialist assisted in surveys in the field of marketing. Informal surveys of egg-buying plants, in cooperation with the marketing specialist and members of the resident poultry staff, formed a basis for general information as to practices in use, and later became the basis for the grades promulgated by the State Department of Agriculture.

In the summer of 1947 the marketing and poultry-production specialists, the staff of the resident poultry division, the county agent, and the Federal State Grading Service surveyed egg-marketing practices in Hennepin County and Minneapolis. Practices surveyed included those of producers, wholesale and retail buyers, and consumers. Most striking findings of this survey were:

1. Only about 50 percent of the eggs used by Minneapolis residents were bought in the retail stores.

2. Less than one fourth of the eggs sold as Grade A by the retail stores were of that grade.

The retail portion of the survey was repeated in the spring of 1948 and each retailer was given a report of the grade of his eggs on the previous survey. It was encouraging to note a pronounced increase (since the previous survey) in the use of refrigeration for eggs displayed.

In 1948 the specialist took part in a survey conducted by the Agricultural Marketing Service of collection stations for some of the larger egg buyers.

Although a few meetings were held from time to time, programs designed for producers were slow in developing. This was partly because it was felt that buying practices, particularly that of buying on grade, were not stable enough to encourage better practices on the part of producers.

Egg Institutes received their first real impetus from an egg buyer and a feed dealer in Red Wing in 1947, partly as an outgrowth of the feed-dealer program carried on during and immediately following World War II. The meeting was arranged by the County Agent with the support of the local chamber of commerce, strongly sparked by the two originators. This community held nine annual Egg Institutes and helped establish the pattern for the program that was developed.

By 1950 it became evident that the program deserved some organized promotion and a broadened approach.

The general pattern follows:

1. Organization within the county with the help of the local egg buyers together with hatchery operators, feed dealers, and other agencies
servicing the poultry industry. In many cases a local businessmen's organization has been a strong factor.

2. An organization meeting of the local committee, attended by the specialist. A general outline of the Institute and one dealing with the Egg Show were provided for each committee member.

3. Program for the day, consisting of:
   a. An egg show for producers who entered one-dozen lots of eggs in specified classes.
   b. An all-day program dealing with production and marketing practices.
   c. Displays dealing with the general subject matter, prepared by both the specialists and the local committee.

From the start an effort has been made to place major committee responsibility in the hands of local businessmen. Much of the promotion has been accomplished through the home project groups. Additional features such as cake shows, judging contests, and 4-H demonstrations have added variety.

The chief value of this program, in all probability, has been the opportunity for cooperative effort on the part of Extension workers, producers, industry representatives, State Department of Agriculture, and the Federal Grading Service, together with a frank analysis of the problems of all concerned.

Concrete results are difficult to pinpoint. A countywide survey of the entire egg business in one county in 1956 is a definite outgrowth of this program. Findings of the survey can be applied to most counties in the heavy egg-producing area. The survey will be followed up in the same county with a series of meetings held separately for producers, egg buyers, retailers, and probably consumers. Here again it may serve as a guide for other counties.

Individuals have been helped through these institutes to better meet the demands of premium markets. Emphasis on clean eggs, cooling, confinement, and frequency of gathering and sale have certainly improved the grade for many producers.

Egg Institutes have been held in nearly two thirds of the counties, representing 85 percent of the total egg production. Most of those counties have held two or more institutes. Perhaps the greatest benefit will come, in the future, from the widespread coverage, which will put producers in a better position to take advantage of the improved markets developing rapidly at the present time.

Now programs will be needed to exploit the potential that has been developed. At the present time it appears that work with buyers to modernize buying practices is urgently needed.
Increased Flock Size

The Minnesota poultry industry is today undergoing another radical change, that of establishing flocks of sufficient size to constitute a major livestock enterprise.

An increasing size of flock has been a continuous trend but its progress has been very slow up to the present time. The trend was more noticeable in the disappearance of flocks of less than 100 hens than in the increase of flocks of commercial proportions. In 1954 flocks of 100 to 400 hens constituted 63 percent of the total, compared with 40 percent in 1930.

At the same time it was increasingly apparent that the average-size farm flock--227 hens, according to the 1954 Federal Census--was operating at an increasing disadvantage in competition with other livestock enterprises as a market for farm labor. A five-year analysis of Farm Management Association records showed an average return of $.21 per hour for time spent on 200 hen flocks, compared with $1.01 for dairy, $.71 for feeder cattle, and $1.51 for hogs.

Records for larger flocks were lacking. Consequently, a survey of labor use on 43 flocks averaging 2,100 hens was made in 1955. Interpretation of these data on a comparable basis indicated a labor return of $1.43 per hour of labor spent on flocks of this size.

The fact that the number of such flocks has been growing rapidly in the past five years would indicate that individual farmers had arrived at the same conclusion. As usual in the case of radical changes, such instances were isolated and results obtained were hidden from the majority of farmers, or were dismissed as applicable in only a few cases. One important function of Extension is to publicize as effectively as possible the advantage of flock units large enough to warrant the kind of management that spells efficiency.

An advantage peculiar to owners of large flocks is the opportunity offered to market eggs at a premium. Buyers looking for high-quality eggs, especially when they require the producer to follow specific production and marketing practices, prefer to fill their requirements while dealing with as few individuals as possible.

Future of Poultry Extension Programs

It has been shown that the Extension program has been in a constant state of change to meet changing situations and changing needs of poultry raisers. New information, particularly as to feeding, has come so rapidly that the principal effort has necessarily been an attempt to keep poultry raisers informed as to the changes and their implications. This was done by a variety of means: general meetings; radio; news articles; and special material prepared for county agents. In recent years the Extension job has narrowed somewhat, due to a number of influences. Perhaps the greatest influence has been the lessened importance to most farmers of the average side line flock which still predominates in the state, along with the decrease in the number of farms that have chickens.
Related influences are the increased use of commercial feeds and equipment, with the growing dependence on services offered by manufacturers. This has been a healthy growth, encouraged by both resident and Extension staffs. Feed manufacturers, for example, have been assisted to make available to their patrons the benefits of research findings and to train their servicemen to assist producers in every way possible. The resident division advises many feed companies on formulation problems and has participated in the Animal Nutrition Short Course held annually since 1942.

The educational programs of the Extension Service have likewise been directed towards hatchery operators, lumber dealers, and egg buyers in a conscious effort to make full use of their close contact with their patrons as a means of establishing sound practices. It is not enough, for example, to confine the efforts to improve egg quality to an educational program for producers only. The informed egg buyer who offers a premium for quality is in the long run the determining factor. The Egg Institute program, which has been a major program of production and marketing specialists since 1950, has consistently attempted to capitalize on the cooperation and leadership of egg buyers and other businesses servicing the poultry industry.

By the same sign the hatcheryman who, in an effort to protect his own business, initiates a program of developing larger flocks as a major enterprise of farms in his area is doing a service to the individual producer and to the community.

Revolution

Extension's job is not done, however. In fact, a bigger job than ever appears to be ahead. Present-day agriculture faces a revolution in the organization of the farm business to meet growing competition. Reorganization involves increased size of enterprise, mechanization, and probably a reduction in the number of enterprises on a single farm.

Farm Home Development

The place of poultry on Minnesota farms of the future remains to be determined. Here is the place where the guidance of Extension workers will be of the utmost importance. Records of recent years have shown clearly that the average side line flock will, to an increasing degree, fail to make a return commensurate with the labor involved. On the other hand, as shown by a survey made in 1955, a flock of sufficient size, handled as a major enterprise, can compete favorably with other livestock enterprises in providing wages for labor.

The program needed in this case fits admirably into the Farm Home Development program. The poultry specialist should play an increasing part in helping county committees and individual farmers to understand what poultry raising as a major enterprise has to offer and the nature of the operation that will be required. From here on the poultry specialist should be the source of guidance as to buildings, equipment, feeding programs, methods of operation in the care of the flock, and in the production, care, and marketing of eggs.
A major-enterprise flock may be expected to require a sizeable investment. The specialist should help farmers evaluate the various practices and equipment that might be considered.

The spread of flocks of commercial size that has already gained momentum in some areas indicates a future need for organized group work designed especially for such producers. Programs may be arranged on an area or state basis where concentration is such that county programs are not warranted.

**Programs for Field Servicemen**

As indicated earlier, the principal businesses which serve the poultry business, hatchery, feed, equipment, and egg buying, are providing an increasing amount of field service. Programs designed for the special needs of these servicemen could make very effective use of Extension's leadership.

**Marketing**

Improving the quality of Minnesota eggs delivered in all areas of the country can be expected to be the number one problem for some time to come in maintaining a profitable poultry industry. Programs in the future will need to give as much attention to the problems of buyers and shippers as to those of producers. Attention must be given to the technological phases as well as to the economic problems.

In all of these programs Extension will be backed by strong research and teaching activities, at present headed by Dr. Elton L. Johnson, Head of the Poultry Husbandry Division; Dr. Robert M. Shoffner in Genetics; Dr. Milo Swanson in Poultry Products; and Dr. Paul Waibel in Nutrition.

**An Organized Poultry Industry**

Current attempts to organize producers into regional and state groups offer an opportunity to inject real strength into the industry. The leadership of Extension will be of paramount importance if sound and clear-cut objectives are to be set up and carried out.

At the same time such groups, because they will be made up primarily of owners of major-enterprise flocks, can be influential in determining the future developments of the industry. They can help to pinpoint the problems requiring research study and Extension emphasis. They can be of assistance in long-range project determination and provide the demonstration information needed in the Farm and Home Development program.

In the marketing field their practices will set the pace for other producers and for the egg buyers.
SUMMARY

The rapidly changing nature of the poultry business in itself makes the program a prime example of the living, growing organism which is Extension. This factor serves to illustrate the cardinal principle that people learn at the point where they are at a particular moment. It also explains the need for changing techniques of teaching as conditions change.

It is not inaccurate to say that at the beginning of the period covered in this report there was no scientific knowledge in the hands of the great majority of poultry raisers. There was, in fact, little enough available at any level.

With no accumulated body of information in a farm enterprise that was almost universal, there was no limit to the number of people who might benefit from instruction. The dramatic response of a flock of pullets at the proper time of year to what was then considered a balanced ration, even the first view of that marvel of the "heartbeat" in a seven-day embryo, were of interest to every farm person.

Under these circumstances the group approach, later augmented by the local leader method, was the only way that necessary information could be disseminated widely enough to fulfill Extension's obligation. The simplest management practice had to be explained, demonstrated, and implemented.

As basic management practices were accepted and were exploited in varying degrees by different producers, the community group method became less fruitful. Countywide meetings required less organization and proved more likely to reach those producers who were interested in a particular phase of production.

At the same time it became more necessary to work with the various industry groups that service the poultry industry to avoid confusion from conflicting information.

Subject-matter emphasis also required change. Starting with a strictly production-based program, there came a time when egg-marketing problems needed concentrated attention. At the present time the problem of reorganization of the farm business calls for more attention to the place of poultry in the farm business and a thorough consideration by farmers of the best size of flock for the individual farm.

Some sort of all-industry organization has been a recognized need throughout. Because of the small size of the individual farm flock there has been little incentive for an organization of producers. Their interests have been represented to a degree, at various times, by statewide organizations such as the Poultry-Hatchery Association, the Poultry, Butter, and Egg Association, and the associations of feed manufacturers and feed retailers. Since 1940 a broader representation has been obtained through the Minnesota Poultry Industry Council.

At this point the producers are preparing to develop their own organization in the form of the Minnesota Egg Producers' Council. Such a move
is possible because of the rapid increase in the number of flocks of a size to constitute a major farm enterprise.

The Extension program will need to be geared to this latest development. Not only will it need to develop programs suited to the needs of these larger businesses, it will also realize, in these "business" poultrymen, a group which can be of great assistance in promoting a more sound poultry industry by counties and throughout the state.
HISTORY

OF

POULTRY

PRODUCTION
The growth of the poultry industry in Minnesota presents a spectacular picture. Receipts from sale of eggs and chickens increased from $17,500,000 in 1919 to more than $108,000,000 in 1954. This increase was brought about by a 78 percent increase in numbers of chickens and a 305 percent increase in eggs produced. During this period the poultry business advanced to a point where it contributed about 12 percent of the gross income sales and occupied a position of third among the sources of farm income. Chickens were reported on 92 percent of all farms in 1920. By 1954 this had dropped to 73 percent of the farms, while the average size of flock had nearly tripled, increasing from 80 hens in 1920 to 227 in 1954.

CHANGES IN SIZE AND CHARACTER OF POULTRY INDUSTRY

<table>
<thead>
<tr>
<th>Year</th>
<th>Chickens on Farms, Jan. 1</th>
<th>Dozen Eggs (Produced 1919)</th>
<th>Cash Receipts from Poultry and Eggs</th>
<th>Receipts from Eggs (% of Total Poultry Receipts)</th>
<th>Percent of Farms Reporting Chickens</th>
<th>Avg. Flock Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1920</td>
<td>13,212,619</td>
<td>56,420,490 sold</td>
<td>$32,499,000</td>
<td>66</td>
<td>90</td>
<td>99 hens</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1954 4/</td>
<td>88</td>
<td>73</td>
<td>227 hens</td>
</tr>
<tr>
<td>1.</td>
<td>U. S. Census for year listed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Farm Production and Disposition of Chickens - June, 1939.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The relative position of Minnesota has changed, too. In tenth place in eggs sold in 1924, Minnesota now occupies third place among the states, supplying 7 percent of all eggs sold compared with 4 percent in 1924.

The trend to date has been toward a reduction in number of flocks and toward an increase in the number of larger flocks. The tables following, giving flock size distribution as shown in the Censuses of 1930 and 1954, indicate that the bulk of the eggs marketed still comes from flocks of relatively small size.
### Distribution of Flocks According to Size

#### 1930 Census

<table>
<thead>
<tr>
<th>Size</th>
<th>Flocks</th>
<th>Chickens</th>
<th>Egg Production, 1929</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>number</td>
<td>% of total</td>
<td>number</td>
</tr>
<tr>
<td>Total</td>
<td>167,475</td>
<td>100</td>
<td>16,611,573</td>
</tr>
<tr>
<td>49 and under</td>
<td>41,817</td>
<td>1,163,457</td>
<td>8,156,825</td>
</tr>
<tr>
<td>50-99</td>
<td>51,689</td>
<td>3,452,222</td>
<td>22,875,998</td>
</tr>
<tr>
<td>100-199</td>
<td>54,298</td>
<td>6,939,693</td>
<td>43,473,912</td>
</tr>
<tr>
<td>200-399</td>
<td>18,200</td>
<td>4,302,270</td>
<td>26,769,828</td>
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<tr>
<td>400-699</td>
<td>1,304</td>
<td>591,966</td>
<td>4,224,014</td>
</tr>
<tr>
<td>700-999</td>
<td>124</td>
<td>96,457</td>
<td>839,758</td>
</tr>
<tr>
<td>1,000-2,499</td>
<td>37</td>
<td>46,808</td>
<td>427,719</td>
</tr>
<tr>
<td>2,500 and over</td>
<td>6</td>
<td>18,400</td>
<td>141,420</td>
</tr>
<tr>
<td>3,200 and over</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>

#### 1954 Census

<table>
<thead>
<tr>
<th>Size</th>
<th>Flocks</th>
<th>Chickens</th>
<th>Dozen Eggs Sold</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>number</td>
<td>% of total</td>
<td>number</td>
</tr>
<tr>
<td>State</td>
<td>111,098</td>
<td>100</td>
<td>26,943,331</td>
</tr>
<tr>
<td>400 and under</td>
<td>92,656</td>
<td>83.4</td>
<td>16,120,275</td>
</tr>
<tr>
<td>400-799</td>
<td>16,166</td>
<td>14.6</td>
<td>7,930,441</td>
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<td>800-1,599</td>
<td>2,008</td>
<td>1,934,965</td>
<td>15,886,061</td>
</tr>
<tr>
<td>1,600-3,199</td>
<td>197</td>
<td>416,650</td>
<td>4,118,795</td>
</tr>
<tr>
<td>3,200 and over</td>
<td>71</td>
<td>541,000</td>
<td>5,329,765</td>
</tr>
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</table>
Production by Size of Flock

<table>
<thead>
<tr>
<th></th>
<th>Percent of Chickens</th>
<th>Percent of Eggs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1930</td>
<td>1954</td>
</tr>
<tr>
<td>Flocks of less than</td>
<td>95</td>
<td>60</td>
</tr>
<tr>
<td>400 hens</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flocks of 400 hens</td>
<td>5</td>
<td>40</td>
</tr>
<tr>
<td>and over</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Formative Years--1920-1930

The growth of the poultry business can be roughly divided into decades. The period 1920-30 marked the beginnings of poultry as a source of income. This decade saw the start of the hatchery business, the introduction of feeding methods that permitted year-round production, and the use of houses designed especially for poultry. It was a period when it was not uncommon for the poultry income to surpass the dairy income, which had been the main cash source. It was especially appreciated as an additional regular source of cash income.

The Hatchery Industry

Commercial hatching of chicks marked a real revolution in the poultry business. Once producers started to buy their chicks, they began to demand assurance of a better product than they had ever known. They began to be interested in identification of breeds and insisted on receiving good representatives of the breed they ordered. They expected a higher rate of production and began to seek sources of stock that would provide the desired quality.

It was in the disease field that the hatchery business probably had its greatest impact at this time. It became, at the same time, both a source of increased mortality and a powerful factor in reducing mortality, once the problem was brought into focus and control methods were developed. It seems not unfair to say that the hatchery industry was the chief source of the rapid spread of pullorum disease (bacillary white diarrhea, as it was called) before it became established that the disease is spread via the egg, the incubator, and by direct contact. It was the rare hatcheryman who had the good luck not to bring the disease into his supply flocks. And even if the chicks left the hatchery clean, they were more than likely to pick it up in transit through contact with chicks from other hatcheries.

Similar hazards developed in later years as new diseases became prevalent, but were more easily dealt with as a result of previous experience.

Forward-looking hatcherymen set about in the mid-twenties to correct this situation. A voluntary organization of Minnesota hatcherymen in the late 1920's was followed by the establishment in 1931 of the Minnesota Poultry Improvement Plan. The Poultry Improvement Board, working with the Minnesota Livestock Sanitary Board, offered supervision of hatcheries, on a voluntary
pay-as-you-go-basis, in the production of chicks of superior quality and with a constantly decreasing mortality as pullorum reactors could be eliminated by testing. The supervision covered also the production of R. O. P. breeding stock, which has been a powerful factor in the improvement of production rates and egg quality. For many years Minnesota had the distinction of using more R. O. P. males in supply flocks than any other state.

Three names stand out among the long-time influences on this steadily expanding industry.

Dr. George Ghostley, a breeder, student, and researcher, began in the early 1920's to assume the role of pace setter for the standards later adopted by breeders and hatcherymen. Recognized throughout the nation as one of the top breeders of Single-Comb White Leghorns, he is widely credited as the major factor in the growth of Minnesota as a predominantly Leghorn state, with a high rate of production and a high rank in total volume of eggs produced.

R. O. P. males from this stock, backed by the unquestioned integrity of the man himself, were a prime influence in the upgrading of Minnesota hatchery supply flocks.

Generous in sharing his wide experience and sound in his approach to the poultry business, he stands out as the mentor of poultry raisers even beyond the confines of the state.

W. K. Dyer, from 1931 to 1957 the Executive Secretary of the Minnesota Poultry Improvement Board, proved unrelenting in his enforcement of the rules, while giving the hatcherymen and breeders his complete backing. Under his guidance the program grew steadily.

Leo Baumgartner, from the early 1930's Executive Secretary of the Minnesota Baby Chick Association, later the Minnesota Poultry Hatchery Association, has carried the banner of promoting a profitable poultry industry for the state, representing it in all its phases in the state and in the nation.

The Great Depression

The depression period of the 1930's brought some gains to poultry raisers along with the hardships. More use was made of the possibilities in feeding economies. Many poultrymen found that increased emphasis on management and on sanitation in rearing chicks resulted in maintaining an income that was favorable by comparison with other livestock enterprises. A county relief administrator remarked that while their relief rolls included many good dairymen, they had never had a good poultryman on the list.

World War II

The next 10-year period, as a result of World War II, was a period of boom for poultry raisers. Protected in both price of feed and price of eggs, in an enterprise that permitted the most rapid expansion in production of a
high-protein food, the poultry population exploded to a level of 30 million hens - a 60 percent increase in five years. Three fundamental ideas became firmly fixed during this period: the necessity for ample feeder space; the value of laborsaving practices and equipment, such as built-up litter, automatic watering, and community nests; and the economy of well-balanced rations. This was the period in which greatest advances in nutrition were made. The great increase in the production of soybean meal and the shortages of animal protein feeds, brought on by greatly increased demand for such feeds, resulted in speeded-up research to provide adequate rations using the new sources. The different B vitamins were more clearly identified and antibiotics came into the picture. The role of built-up litter as a source of B vitamins brought a new concept to the role of management. Crossbreeding and hybridization made rapid strides and the broiler industry grew from insignificance to a highly specialized mechanized industry that literally destroyed the market for farm chickens. At the same time, the greatly increased rate of lay and the increasing practice of buying sexed pullets for replacement of laying flocks reduced the total numbers of surplus chickens to be disposed of.

Postwar Adjustment

The postwar period following 1950 might be called one of adjustment. It was well understood that the industry was overexpanded for peacetime needs.

However, it is a source of encouragement to Minnesota poultry raisers that the reduction in the size of the industry has not been as great as in most of the other Midwest states. An upward adjustment has occurred in the average size of flock, increasing 30 percent between the Census years of 1950 and 1954. This was accompanied by a further drop in the number of farms reporting chickens--to 73 percent of all farms. Complete data are not available, but it is evident that there has been a considerable increase in the number of commercial-size flocks since 1950. It is expected that this trend toward fewer flocks but larger ones will continue and that it will be speeded up.

The entry of buyers of premium-quality eggs into the market is probably the greatest factor in this trend to date. The extent to which this type of market expands will determine the extent of expansion in size of flock.

Egg-Marketing Development

An early marketing program similar in principle to the premium-quality programs now in successful operation in different parts of the state was continued successfully for nearly 50 years in Barnum. Started in 1908 by the local banker, H. C. Hanson, it offered a premium outlet through the local creamery to local producers who would follow a specified program of production, care, and delivery.

The producers agreed to:

1. Gather eggs twice daily
2. Market no eggs more than eight days old
3. Deliver eggs of uniform size and color
4. Deliver clean eggs
5. Hold eggs in a cool, dry place
6. Sell all eggs to the creamery
7. Stamp individual eggs

At the creamery the eggs were cartoned and sold to retail outlets in Duluth and Iron Range towns.

Grading for interior quality was unknown and reliance was placed on direct contact with producers and the individual's own stamp on each egg so that quality could be immediately checked at the source.

Similar programs were started at about the same time in Askov and Dassel, with only slight differences in rules and methods of operation. The early cessation of these two programs was probably due to dependence on producers to assume the marketing function, rather than, as in the Barnum case, making use of the local creamery which already had established outlets and a reputation for high quality in its dairy products.

The Barnum operation gave way in the mid-fifties to a commercial operator, who ships in eggs from a wide radius.

The demise of this marketing program was probably due to many influences. Improvements in transportation and in marketing methods no doubt increased the competition from areas with lower feed costs to a point where poultry raising ceased to be profitable. In the 1954 Census poultry was reported on only 38 percent of Carlton County farms, as compared with 61 percent of the farms in 1930. Egg sales in 1954 were only 337,000 dozen as contrasted with a peak production in 1930 of slightly more than 1,000,000 dozen.

The failure of this type of direct sale may raise a question as to the permanence of current programs of the same type. However, with more accurate measures of quality, with more knowledge as to factors in producing good quality and maintaining it, and with continuing research along these lines, the current programs have a good chance of survival.

Perhaps the situation merely emphasizes the economic hazards to egg production in an area where all feed must be purchased and where surplus production must inevitably sell in competition with eggs from the areas of lower-cost production.

At the same time the small size of the individual flock made it difficult to assure continued emphasis on quality and even to assure regular delivery to the local outlet.
A Statewide Cooperative

This was certainly the case with the statewide Lake Region Cooperative Egg Association organized in 1925. Neither the volume nor the quality necessary to cover the large overhead was available in this period of small sideline farm flocks. Prices offered by independent buyers proved too attractive in many cases. The losses to members and to the local boards of directors were so great as to preclude for many years any discussion of cooperative marketing of eggs. However, it is questionable whether even today there is any area in the state with sufficient volume produced by large-enough flocks to enable a cooperative organized solely for egg marketing to survive the inevitable competition. A possible exception might be small groups of owners of commercial-size flocks who might band together to supply a specific quality market, cooperating in assuring desirable production practices rather than in the actual buying and selling.

Egg Laws

Regulation of the marketing of eggs was early recognized as a function of the State Department of Agriculture, Dairy, and Food.

As early as 1920 the Egg Law required licensing of dealers in eggs and candling by the first licensed buyer, prohibited the sale or display of inedible eggs, and required the licensee to pay for only "good, edible eggs." The law of 1920 required the labelling of cold-storage eggs, which were defined as "eggs that have been held in a room or warehouse for a period of 30 days or more." It also required the labelling of "held eggs," defined as "eggs which have become deteriorated because of having been held from use for an unreasonable length of time, whether in cold storage or otherwise." The law made no mention of grades.

Changes in the law were made from time to time. The Egg Law of 1932 with its supporting regulations carried some additional provisions:

1. Required grade labelling of eggs sold or displayed for sale to consumers, except eggs of his own production sold by a producer.

2. Permitted omission of the candling slip on interstate shipments when "stipulated grades on all case-lot eggs are designated."

The law of 1937 added further provisions:

Officially graded eggs must be designated by the official grade designation. If not officially graded, they must be designated as "unclassified" or by a brand name registered with the Commissioner of Agriculture, Dairy, and Food. This ruling applied to both wholesale and retail lots.

A major revision in the 1948 Egg Law required "Persons buying eggs from the producer (or selling at retail) on a grade basis to do so on the basis of purchase grades (or consumer grades) promulgated by the Commissioner of Agriculture, Dairy, and Food."
While U. S. quality designations were used almost exclusively from the earliest laws, the 1948 regulations reduced the number to only three - A, B, and C, with size grades of large, medium, and small for eggs of A quality.

An important change in the Egg Law of 1957 made compulsory the sale of all eggs on grade at both wholesale and retail. A provision of the regulations authorized the Commissioner to approve the use of "a name to be selected as a prefix to the consumer grades 'to label' eggs that have been produced, handled, and purchased by the first buyer under specified, restricted, contractual conditions for quality control between the producer and the original purchaser."

Two other significant changes were made:

1. Authorization of the Commissioner to permit candling outside the state if done under the supervision of the U. S. Department of Agriculture, the grading report to be made on the basis of Minnesota purchase grades.

2. An inspection fee based on volume of eggs handled during the month of April, and 85 percent of all fees and fines collected to be credited to the egg-law inspection fund.

Organization of the Industry

Poultry Industry Council

As commercial poultry production increased in other areas, the poultry industry in Minnesota found itself handicapped by lack of organization. From time to time efforts were made by individual counties to set up an active poultry committee to promote educational programs and to consider over-all problems. Each of these organizations failed to achieve permanence, solely because the individual farm poultry enterprise was too small to provide incentives necessary to such an activity.

In the meantime, as an outgrowth of Minnesota's participation in the seventh World Poultry Congress at Cleveland in 1939, the Minnesota Poultry Industry Committee -- later changed to Minnesota Poultry Industry Council -- had been organized for the purpose of promoting the welfare of the poultry industry. Active membership consisted of industry groups allied to the poultry industry, with educational and regulatory groups as associate members. From the beginning this committee served as a clearinghouse for problems affecting the various branches of the industry.

A highly important activity of the council, started before World War II and revived in 1953, has been the poultry industry exhibit at the Minnesota State Fair. Directed primarily at consumers, the exhibit has featured the products and the processes followed by the industry to insure the consumer high quality in a valuable food.

A stepped-up promotion program in 1958 included contact with school-lunch leaders to encourage more satisfactory use of eggs in the school-lunch
program. The Golden Egg Breakfast, in its second year, brought the wholehearted support of the industry.

CURRENT TRENDS

Caged Layers

It is probably the promise of a premium outlet for eggs that has provided the major impetus toward cage operation. The result may, however, be disappointing, since the higher labor requirement of cage operation tends to limit the size of enterprise. With preference given to large-volume producers, the producer who uses conventional floor operation may still have the advantage when it comes to finding premium outlets. Economical methods of reducing labor or advantages in rate of production and quality and condition of eggs will be needed if cage operation is to enjoy general popularity.

Integration

The degree of integration to be anticipated in the egg business is difficult to foresee at the present time. Some deterrents to any rapid trend in that direction are evident. Contracts for the purchase of eggs at premium prices on the basis of a prescribed production program have been accomplished with little additional capital investment, and the prices have been attractive enough to build the supply about as fast as the demand required. The same is true to a large extent in cases where the poultry enterprise has been expanded to major-enterprise status. In many cases the poultry enterprise has replaced some other livestock enterprise, buildings already available have been converted, and the need for capital has been of minor importance. Perhaps the greatest deterrent to Extension integration will be the many alternatives which are available to Minnesota farmers.

FUTURE OF THE POULTRY INDUSTRY IN MINNESOTA

The poultry industry in the state has shown astonishing strength in the face of a noticeable shrinkage in the size of the business in the North Central states as a group. Between January 1, 1940, and January 1, 1957, the number of hens and pullets in the North Central states dropped nearly 8 million, or 7 percent. In Minnesota the number of hens increased nearly $4\frac{1}{2}$ million, or 23 percent. The only other state in the area to show a gain was South Dakota, with an increase of about $1\frac{1}{2}$ million hens, or 21 percent. Ranking third in total egg production, the production per hen in 1957 was 205 eggs, compared to 196 average for the United States and 199 for the North Central region.

It is remarkable that, while there have been some noticeable shifts in areas of concentrated egg production, the largest increases have occurred in the areas near centers of population, notably the Atlantic Coast and in California, while Minnesota still has to export about 70 percent of her production.
Minnesota has established a reputation for high-quality eggs which, if continued, can be expected to strengthen her position.

As farm businesses are reorganized to make best use of their resources, it seems likely that there will be a continued upward trend in major-enterprise flocks and a continued downward trend in the total number of flocks.

The increase in the number of major-enterprise flocks can be expected to bring another advantage -- that of an effective organization of poultry raisers to protect the interests of the industry and to help guide its future.