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## EC70-1425 Feasibility of Specialty Poultry Production and Marketing in Nebraska

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EC 70-1425

## FEASIBILITY OF SPECIALTY POULTRY PRODUCTION AND MARKETING IN NEBRASKA

Earl W. Gleaves, T. E. Hartung,  
G. W. Froning and J. A. Ranson<sup>1</sup>

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### INTRODUCTION

The possibility of losing one of only two turkey markets remaining in Nebraska led to the start of this study.

The Nebraska Turkey Growers Cooperative Assn., which processes both hen and tom turkeys, was having difficulty obtaining enough product to remain competitive in processing cots. The other processing plant is primarily interested in buying toms. If the Coop had failed, there would have been no market for hens. Consequently, the turkey industry in the state would have collapsed.

Turkey processing costs continued to increase each year. Operating costs were too high for the processing plants to exist without an increase in output. There appeared to be only two ways to accomplish this.

The first was to increase the tonnage of turkey going through the plants. Success in trying to accomplish this has been negligible. The Nebraska turkey industry, though fairly stable, has not increased in size in over 10 years. In addition to the size of the industry, it was not equipped to produce turkeys the year around. Consequently, a plant could operate only six months of the year.

The second was to find some related production to keep a plant operating for 10 to 12 months a year, thus reducing overhead costs for both turkey processing and any related processing.

The problem became one of trying to find related production for the processing industry. There was no commercial broiler production in the state nor much hope that there could be because of the competitive position of the well established broiler industry in southeastern United States. Some light fowl are produced in Nebraska, but adapting the production line in a turkey processing plant to handle them is costly. An additional problem with fowl is that they go to market year around and the seasonal aspect of turkey processing does not readily blend with light fowl processing.

On the surface, specialty poultry processing offered some hope; but, there were many unanswered questions in this area. The state did not produce specialty poultry on a scale large enough to help the turkey processing industry. Therefore, the question of whether it could be developed had to be answered. Other questions that needed to be answered were:

Is there a market for these products once they have been produced and processed?

Can this type of production be profitable for Nebraska farmers?

What technology should be used? To what extent can this type of production be done without flooding the market?

A feasibility study was necessary to answer these questions. The study that was developed is described and discussed in the following pages.

### DESIGN OF THE FEASIBILITY STUDY

A cooperative arrangement between the Nebraska Department of Economic Development, the Poultry Science Department of the University of Nebraska and the Nebraska Turkey Growers Cooperative Assn. at Gibbon, Ne., was developed to sponsor and fund the study. The Poultry Science Department was assigned project leadership.

The study was divided into three major phases. These categories were based both on objective accomplishment and the capabilities of the three cooperating parties. The three phases and the contributing parties were:

1. Phase I—*Consultant Information*, funded by the Nebraska Department of Economic Development and conducted by the Poultry Science Department.

2. Phase II—*Local Information*, funded and conducted by the Nebraska Turkey Growers Cooperative Assn. and the Poultry Science Department.

3. Phase III—*Coordination and Distribution of Information*, the Poultry Science Department of the University of Nebraska.

Objectives of the study were:

1. Determine the market capability and potential for capons, roasters and fowl on a national scope.

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2. Determine production costs and techniques of specialty poultry.
3. Determine processing costs and techniques for specialty poultry.
4. Determine feasibility of production and marketing during the off season for turkeys for the Nebraska Turkey Growers Cooperative Assn.
5. Determine the relationship of specialty poultry to other segments of Nebraska's poultry industry.
6. Determine the economic impact on the Nebraska economy of specialty poultry and turkey production, processing and marketing in Nebraska.

7. Implementation of specialty poultry production and marketing. Developing a prospectus for industry involvement.

*Phase I.* The purpose of Phase I was to accomplish objectives 1 and 2. Three consultants were hired to obtain specific information on specialty poultry production and marketing. The three consultants were:

1. Dr. W. J. Stadelman  
Department of Poultry Science  
Purdue University  
Lafayette, In. 47907
2. Mr. John Skinner  
Department of Poultry Science  
107 Hiram Smith Annex  
University of Wisconsin  
Madison, Wi. 53706
3. Dr. Ralph Baker  
Poultry Economist  
Ohio State University  
Columbus, Oh. 43210

Dr. Stadelman and Mr. Skinner were each brought to the Poultry Science Department for two days to discuss production and marketing of specialty poultry. Dr. Stadelman consulted for the project on Feb. 6 and 7, 1969 and Mr. Skinner met with us on March 11 and 12, 1969. Two to three Poultry Science Department staff members attended these sessions. The questions and discussions were all recorded on a tape recorder and later transcribed to provide the consultant's reports.

Dr. Baker arrived on March 24, 1969 for one half day to plan the marketing portion of the study. Because of a limited budget, it was decided that Dr. Baker would conduct a survey of the Northeastern and Chicago markets by phone. After this survey was conducted, he submitted a written report on May 19, 1969 and returned to Lincoln for a discussion period on May 27, 1969 that was tape recorded. In addition, Drs. Baker, Froning and Gleaves spent two days surveying the Lincoln and Omaha markets on June 23 and 24, 1969.

*Phase II.* The purpose of Phase II was to accomplish objectives 3 and 4. Specific information on producing, processing and marketing specialty poultry under commercial Nebraska conditions was obtained through pilot projects.

The Poultry Science Department conducted two experiments involving 767 broilers, roasters and capons. The first experiment started on Nov. 7, 1968 with day old broiler-type checks. It included 472 birds randomly distributed into 10 pens. There were five treatments composed of a male and female control, a male and female Esmopal injected treatment and surgical capons. The complete experimental design is shown in Table 1.

A starter-grower ration which contained 21% protein and 2880 kcal. M. E. per kg. was fed from 0-10 weeks. The finishing ration was fed from 10-16 weeks and contained 15.2% protein and 2411 kcal. per kg. Mortality records were maintained daily. Body weight and feed consumption data were collected at 8, 11 and 16 weeks. The birds were dressed in the University of Nebraska Poultry Science Department processing laboratory.

The second experiment started Sept. 26, 1969. Seven pens containing a total of 295 birds were randomly assigned to a male and female broiler treatment, a male and female light roaster treatment, a male and female heavy roaster treatment and an Esmopal heavy roaster treatment (Table 2). Mortality, body weight and feed consumption records were kept from day 1 to the end of each treatment.

The same starter-grower ration was used in this experiment as in experiment one. They were fed the 15.2% protein ration from the fifth through the eighth week. Then they were changed to a 12.6% protein finisher with 3018 kcal. of M. E. per kg. of ration.

At the end of each treatment period the birds were dressed. The carcasses, necks, livers, gizzards and hearts were weighed. Carcasses were examined and defects were classified.

A third experiment was conducted by a Nebraska turkey grower and the Nebraska Turkey Growers Cooperative Assn. About 1,000 commercial broiler-type chicks were grown out to 12 weeks of age on the grower's farm. They were fed a



commercial broiler feed. Production cost records were maintained by the grower. The birds were processed by the Coop and processing cost records were maintained.

*Phase III.* The purpose of Phase III was to accomplish objectives 5, 6 and 7. This was done by compiling, coordinating and analyzing the results of Phases I and II. It was during this phase that the authors arrived at the decision of whether they thought the production and marketing of specialty poultry in Nebraska was feasible.

## RESULTS AND DISCUSSION

*Phase I.* Transcriptions of discussions with Dr. Stadelman and Mr. Skinner provided 81 and 127 double spaced, typewritten pages of information, respectively. Dr. Baker's original report on the market situation in New York, Chicago and Boston was 11 pages long. Later discussions with him provided an additional 62 pages of material.

Space does not permit inclusion of complete transcripts of these discussion. However, the authors condensed the information into tabular form (Tables 3-7). Complete copies of the transcripts are available through the Poultry Science Department, University of Nebraska, Lincoln, Ne.

Tables developed are comprehensive and self explanatory. They should answer specific questions about production of surgical and chemically treated capons (Table 3), roaster production (Table 4), the processing of these birds (Table 5), and the marketing of them (Tables 6 and 7). With the idea that the reader can find answers in the tables to the specific questions that come to his mind, discussion here will be limited to some general ideas.

Five types of specialty poultry were mentioned in the discussions. They were cornish game hens, broilers, chemically (Esmopal) treated capons, surgical capons and roasters. Cornish game hens and broilers appear to be important prospects only from the standpoint of disposing of the female side of straight-run chicks for roaster or capon production.

However, even as a means of disposing of the females, there are major problems in their production and marketing in Nebraska. This is especially true in regard to the original problem of finding additional production for a turkey processing plant. Special shackles and picking equipment would need to be installed in a turkey processing plant to successfully process these small birds. The second problem is a market. The broilers would have to compete with the heavy production from the Southeastern United States and a complete marketing program would need to be developed for the cornish game hen.

Chemical treatment (Esmopal) of broiler-type birds yields a product more nearly like a roaster than a capon. This is true both from the standpoint of production and marketing. The chemically treated bird costs an extra 6-7 cents a bird but reaches roaster size (7-8 lb.) a week or two earlier than non-treated birds. With these ideas in mind, Esmopal treatment, broiler production and cornish game hen production all become tools that may be used in roaster or capon production rather than a major type of specialty poultry production. This brings the discussion down to two major prospects (capon and roasters) for specialty poultry production in Nebraska.

## CAPON PRODUCTION

Disregarding market capabilities, information from the consultants make it clear that Nebraska has the resources to become competitive with other production areas in capon production (Table 3). Production costs of 20-25 cents per lb. seem possible. Adequate sized, low-cost, off-season turkey brooder housing or unused broiler and layer housing would be sufficient to start the development of a capon industry. Feed ingredients are abundant and available at a competitive price. Satisfactory chicks are available from Nebraska or neighboring states.

In the event that Nebraska starts a capon production program, it can be expected, as in other states, that breast blisters will be the production problem. These blisters cause downgrading and consequently a lower monetary return than might otherwise be expected. Instances of flocks with 50-60% blisters have been reported. Little is known about the control of breast blisters. It has been shown that there are fewer blisters when birds are on litter rather than on wire. Rough surfaces such as wooden trough feeders, junk piles or unneeded equipment in the house promote breast blisters. Overcrowding also appears to accentuate the problem. Even though these are known, breast blisters are still a problem. Additional research needs to be done in this area.

The second largest problem is disposition of the female side of straight-run broiler chicks. To hold chick cost of the capons to a minimum, the females must be sold in the most profitable manner. The alternatives appear to be to sell: as broilers, as cornish game hens, or as roasters.

Any one of these methods might be satisfactory, depending upon the market that can be developed. A fourth alternative is to arrange with hatcherymen to sell the female chicks for you to small flock broiler customers. Regardless of the method chosen it is obvious that a decision must be reached before chicks are purchased.

Capon could be produced in turkey brooding facilities during the off-turkey season. However, special sanitary management conditions would need to be practiced to hold down the risk of diseases, especially as far as turkeys are concerned.



The marketing season is practically the same for both turkeys and capons (Table 6). Therefore, if capons were produced during the off-turkey season, it would be necessary to freeze and hold them for a later market. The cost of freezing and storage would cause some economic disadvantage. This, plus the extra care needed in management of turkey facilities, leads to the conclusion that anyone starting into capon production will be at an economic advantage if they specialize in only capon production. An exception might be a combination of roasters and capon production.

A short term problem that will exist in Nebraska is to find someone with the training and skill to surgically caponize large flocks of birds. There is no reason to believe that this knowledge and skill cannot be developed. However, it will be a problem for the first few producers that go into business. The problem is two-fold.

First, someone must be trained to do this job.

Second, they must be fast enough and accurate enough that costs for the job are held to a minimum.

Other competitive areas are able to caponize for a cost of 8-10 cents per bird and we would need to do as well or better.

Even though Nebraska has the resources to be competitive in capon production, the problems that were pointed out by the consultants and discussed here make it clear that a producer going into capon production must do some pre-production planning if he expects to succeed. As in other farm enterprises, the objective is a reasonable profit. Planning may direct some individuals to go ahead with the project, while other individuals may elect to forego the project after in-depth study of their situation.

### ROASTER PRODUCTION

Disregarding market capabilities for the moment, information from the consultants indicates that Nebraska has the capability to become competitive in roaster production. Nebraska should be able to meet production costs of 20 cents per lb. (Table 4). Reasons for this are the same as those given under the section on capon production. In addition roaster production is free of the short-term problem found with capon production—the need to develop the skill to caponize.

Breast blisters and disposition of females are the major problems in roaster production as they were in capon production. However, roaster marketing is not quite as seasonal as with capons (Table 6). A turkey processing and marketing organization could concentrate on the spring and Easter market to dispose of chicken roasters if they felt that Thanksgiving and Christmas marketing was taking too much effort away from turkeys.

The consultants agreed, as they did with capon production, that specialization in roaster production offers economic advantages over mixing chicken roasters and turkeys in the same facilities. They agreed also, as in capon production, that the successful producers going into roaster production will be those that do some pre-production planning and groundwork.

### SPECIALTY POULTRY PROCESSING

There was unanimous agreement among the three consultants that properly adjusted turkey processing equipment could be used to process capons and roasters. They agreed also that special equipment would be needed to process light fowl, fryers and cornish game hens.

The shelf life of frozen capons and roasters appears to be adequate (Table 5) so that either could be processed in the off-turkey season and held for the optimum market. There was no agreement among the consultants on the best type of packaging material in which to freeze capons and roasters and maintain eye appeal for the customer. However, our own work at Nebraska indicates that heat-shrinkable polyvinylidene chloride film should be adequate.

There is little doubt that Nebraska has a problem in processing facilities to handle small birds. This fact adds to the problem of disposing of the female side of the stock for either capon or roaster production. However, all ingredients exist in the state to meet the 8-10 cents/lb. processing costs for the larger birds that are existent in competitive states.

### SPECIALTY POULTRY MARKETING

*Local situation.* The survey of the Lincoln and Omaha markets revealed that it will take considerable time and money to develop any sizable market for either capons or roasters through retail stores in Nebraska. They have not had sufficient quantities of this type of product to know what can be done with it. Retailers were skeptical that roasters and capons would sell at prices comparable to the Eastern markets. It was obvious that heavy broilers were the only chicken roasters known to them. Normally these are sold at only a few cents above regular broiler prices. However, it is a good item for the retailer because he buys this product at broiler prices. These problems may seem insurmountable, yet all retail buyers contacted indicated that if they could depend upon supply they would try enough roasters and capons to determine whether they could be marketed.

Poultry wholesalers who were contacted were more optimistic about developing a market for roasters and capons than were retail buyers. However, wholesalers felt that such a market would be quite thin and easily flooded with product. Mr.



Skinner suggested (Table 6) that a market of 1 bird/capita might be developed nationally. If we apply this idea to the Lincoln-Omaha area and put the wholesalers "market thinness" concern into numbers, there might be a local market for 300-500,000 roasters and capons.

Another aspect of the local market survey was that every retailer contacted wanted to buy fryer-roaster turkeys. None of them felt they had an adequate supply of this product. They presented convincing arguments that they could sell fryer-roaster turkeys year around.

The interest of retail buyers in fryer-roaster turkeys could indicate that Nebraska should expand production of this product. On the other hand, it could indicate a larger local market for a product of this kind which might be chicken roasters and/or capons. Unfortunately, the scope of this study was not broad enough to study the production costs of fryer-roaster turkeys. If they can be produced profitably, then Nebraska would do well to expand this phase of turkey production.

It is obvious that a producer would be foolish to start growing a flock of roasters or capons without first making some definite marketing arrangements. There were positive indications that some roasters and some capons can be sold in Nebraska. The market must be developed. This will require cooperation between producers and local buyers to ascertain the local market potential.

*National Situation.* There is an established market for roasters and capons in New York, Boston and Chicago. These markets are thin and already being supplied with product. However, a dependable supply appears to be a problem for them. No one seems to know how many more birds these markets could sell without "breaking the market." The wholesalers contacted were anxious to talk about dependable sources of supply but they all warned that they could only handle small quantities at a time (Table 6).

With proper pre-production arrangements with brokers or wholesalers in the New York-Boston area, entry into the market is entirely possible. Entry into the Chicago market might be more difficult because of existing arrangements with nearby producers. Even with problems that have been discussed concerning the local market potential, entry into the local market will probably be easier than into the national market. This conclusion is based primarily on the fact that distance from the national market will slow down pre-production arrangements. However, once the local market is developed, the potential of entering the national market is good.

The average wholesale selling prices of frozen ready-to-cook roasters at New York from 1960-1968 are presented in Table 7. Light roasters (4.0-4.5 lb. dressed) do not sell as high as 5 lb. and up birds. Six lb. dressed weight birds are required to command top price. However, this range in size of birds that will be accepted on the market gives an opportunity to sell both females and males as roasters. The females could be kept for a shorter time and sold at a lighter weight than the males.

*Phase II.* Specialty poultry Experiment No. 1 (Table 8) was designed to study the growth rate and feed conversion of male and female broiler chicks grown to roaster weights with and without Esmopal. It was planned also to gain some knowledge on the growth rate, feed conversion of caponized males, and development of the skill of caponization.

The most obvious result was that the caponization techniques used were not successful. Later attempts to perform the operation indicated that the birds in Experiment 1 were too large (8 weeks) when caponization was performed. Mr. Skinner recommended that caponization should be done when the birds are 3-4 weeks of age (Table 3).

The birds had not been injected with Esmopal at broiler age (8 weeks) and neither the males or females were heavy enough for roasters. Since neither lot had been injected, no differences in weight gain or feed conversion were expected. The differences were very minor at this stage. The Esmopal lots were injected at 10 weeks of age.

One week after injection (11 weeks) the differences between the Esmopal and control lots remained very small and followed the same pattern as the 8-week measurements. The Esmopal treated birds, both male and female, were heavier than the controls at 16 weeks of age. The treated males were 3% heavier than the controls and the treated females were 5% heavier than the controls. Feed conversions were improved by Esmopal by 3.4 and 1.5%, respectively, for the males and females.

The females were not large enough for roasters at 11 weeks but were heavy enough at 16 weeks. However, feed conversion was getting poor by this time. Using the conversion rates reported in Table 4, it appears that the females should be marketed sometime between 11 and 16 weeks of age.

Specialty poultry Experiment 2 (Table 9) was designed to further study growth rate and feed conversion of male and female broilers and roasters. In addition, processing data were compared and defects determined.

All birds were too light to sell as roasters until after 12 weeks of age. The females were at a very minimum roaster weight at 12 weeks of age. Using a lower protein finisher appeared to help hold feed conversion down but it could help account for the relatively poor dressing percentages obtained on the older birds. These data indicate that the females should be held longer than 12 weeks.

The Esmopal injected males were again about 3% heavier than the controls at 14 weeks with about the same feed conversion. Mortality was a minor problem throughout the experiment but was greatest in the Esmopal treated males.

As mentioned earlier, dressing percentages were lower (by 10%) than was expected on the basis of the consultant's reports (Table 5). Dressing percentages did improve as the birds became older. At 16 or 18 weeks they might be better but it is



doubtful that they would improve by 10%. Additional research needs to be conducted to determine whether low protein levels do cause a decrease in dressing percentage. Protein level is suspected because it is the only variable that was considerably different from the consultants' recommendations. The weight percentage of necks, livers, gizzards and hearts decreased as the birds were dressed at later ages.

Carcass defects increased as the birds grew older and especially after 12 weeks of age in the males and 8 weeks in the females. The worst period for females was between 8 and 10 weeks but improved between 10 and 12 weeks. This may indicate that birds once bruised or blistered healed during this two-week period. It is interesting to note that the Esmopal treated males had less breast defects than either the 12- or 14-week-old untreated males.

Data from these two experiments demonstrates a conflict of problems for the producer. The birds need to be grown as large as possible to receive the best price per pound (Table 7). However, the longer the birds are held, feed conversion drops and breast defects increase. An economic compromise will be the determining factor in exactly how long the birds are held.

A flock of 1200 light roasters were grown out by a member of the Nebraska Turkey Growers Cooperative Assn. The primary objectives of the project were to determine production costs under semi-commercial conditions and to see if light roasters (4-5 lb.) could be processed in the turkey processing plant. Results of this study are presented in Tables 10 and 11.

The producer (a turkeyman) was purposely given a minimum of suggestions to start the project. Major production conditions, including out-of-pocket costs, are presented in Table 10. It is obvious, under the conditions of this trial, that there was no profit. Out-of-pocket costs (42.7 cents/lb.) were just barely returned to the producer even though he sold the product at retail prices (45 cents/lb.)

These results immediately raise the question: Can a producer hope to make a profit in roaster production in Nebraska? A production cost of 42.7+ cents/lb. is considerably higher than the 20-23 cents/lb. suggested by the consultants (Tables 3 and 4). According to all of the information given by the consultants, Nebraska producers should be able to produce roasters as efficiently as other states; nevertheless, this trial indicates that the costs are more than twice as high as other states. The answer may lie in management experience.

Comparisons between the information in Tables 4 and 10 reveal some management differences. Feeder and waterer space are low in Table 10. This could account for part of the reason for rather poor feed conversion. Feed conversion for the birds in Experiment 1 (Table 8) was 2.77-3.47 lb. feed/lb. gain at 11 weeks compared to 4.35 lb. in this trial. This is a difference of 23 to 36% which could be a reduction of 10 to 15 cents/lb. in the cost of production.

Feeder and waterer space probably do not account for all the difference in feed conversion. The starter feed used in the producer trial was about 2% lower in protein than recommended. Additional protein in the starter ration would have produced a faster early growth and, consequently, improved feed conversion. Feed conversion might also have been improved by using 14-16 hours of light per day after the first week, rather than 24 hours for the total growing period.

Another possibility for reducing costs or improving market value would have been to sell the females at 11 weeks and keep the males to 16 weeks of age. It is obvious that management experience and skill are an essential ingredient if a profit is to be realized in roaster production.

It is encouraging to know that 2.75-3.5 lb. dressed weight birds can be processed with turkey processing equipment (Table 11). Even with the light birds the processing cost of 10 cents/lb. was fairly competitive. Nebraska Turkey Growers Cooperative Assn. felt these costs could be reduced with a larger volume of heavier roasters. The Association recommended also that a cut-up market be developed along with the whole carcass market, so that the best possible price could be received for the undergrades.

*Phase III.* Both the hatchery industry and the feed industry in Nebraska have expressed an interest and a need to develop additional phases of the poultry industry. No conflicts developed with any phase of the industry during the course of the study and it was discussed with them many times. Our existing poultry industries are hopeful that a specialty industry can be developed.

Even though the potential size of a specialty poultry industry appears small in comparison to the turkey or egg industry in the state it can develop into an industry of economic importance. Research work at Ohio State University a few years ago showed that \$1.3 million in business was generated around 100,000 laying hens. Using an estimate of half of this amount for 100,000 roasters there would be \$650,000 in business generated. The estimate of a potential local market for 300-500,000 roasters could generate \$1.95 to \$3.25 million in business in the state.

An average carcass weight of 4.5 pounds times 300-500,000 roasters could mean an added tonnage of 13.5 to 22.5 million pounds of product for the turkey processing industry. There is no doubt that this extra tonnage could decrease the processing costs for both the turkey and roaster industries. In addition the existing processing plants could show a profit with the added tonnage.

A roaster or capon industry in Nebraska could be valuable to the existing poultry industries and the state. The question remaining is: Is it profitable for the producers?



## OTHER CONCLUSIONS

In view of the material presented in this study, the authors think that under certain conditions roaster production can be profitable for the producer as well as other segments of the poultry industry. The conditions are: (1) produce for a specific market and (2) producer must be a part of an organized production and marketing program with close supervision. Both males and females should be grown out as roasters.

For a roaster industry to be successful in the state it will take someone or some organization to lead and direct it. The leader will need to establish markets, coordinate production for the market and the processing industry, establish efficient and economic sources of chicks and feed for the producer and provide management skill and experience for the project. The producers might work through the project leader on a contract or independent basis depending upon the overall program.

Independent producers may have difficulty purchasing all of the input materials efficiently, obtaining management skill and developing a market. However, a few producers may have access to these tools and if they do they can be quite successful, especially if they produce only enough birds to supply a nearby market.

Cornish game hens and broilers were eliminated as specialty poultry items that might undergo expansion except as a possible means of disposing of the female side of a roaster program. The major reason for this elimination was a lack of processing facilities. Nebraska has the other raw materials to efficiently produce these products but a processing plant must be nearby.

Capons were eliminated because of the thinness of the market and the distance from the national market. If a roaster industry, large enough to supply some of the national market, develops in the state, the potential for some capon production would improve. Esmopal implanted birds might play an important role in either a roaster or a capon industry.

These are the conclusions reached by the authors but each and every person interested in specialty poultry production and marketing in Nebraska should go back and analyze all of the information presented in the study and arrive at his own conclusions. Your own conclusions may be different.



Table 1. Experimental design for specialty poultry Experiment 1.

Treatment	No. of pens	No. of birds/pen	Sex
Control	2	50	M
Control	2	42	F
Esmopal <sup>a</sup>	2	52	M
Esmopal <sup>a</sup>	2	42	F
Surgical capons <sup>b</sup>	2	50	M

<sup>a</sup> Birds were each injected at 10 weeks of age with approximately one gram of Esmopal.

<sup>b</sup> Surgery was performed at 8 weeks of age.

Table 2. Experimental design for specialty poultry Experiment 2.

Treatment	Type	No. birds	Sex	Weeks of age at close
Control	Broiler	47	F	8
Control	Broiler	57	M	8
Control	Light roaster	47	F	10
Control	Heavy roaster	47	F	12
Control	Light roaster	39	M	12
Control	Heavy roaster	39	M	14
Esmopal <sup>a</sup>	Heavy roaster	39	M	14

<sup>a</sup> Birds were each injected at 9 weeks of age with about one gram of Esmopal.



Table 3. Capon production facts as obtained from consultants.

Production item	Capon <sup>a</sup>	
	Esmopal <sup>b</sup>	Surgical <sup>c</sup>
Unit size (minimum)		2,500-5,000
Breed or strain	White Mountain (Hubbard)	Penobscott, Cobb, Arbor Acres, Hubbard
Floor space requirements	2.0 start, go to 2.5 ft. <sup>2</sup> /bird	1.5 start, go to 2.0 ft. <sup>2</sup> /bird
Feeder space requirements		2.0-3.0"
Waterer space requirements		0.4-0.5"
Litter type	Crushed peanut hulls	Shavings
Lighting program		
Vaccination program	None	None
Debeaking program	None	None
Feeding program		
Protein level		
0-4 weeks	21-22%	22%
4-8 weeks	18-19%	20%
8-18 weeks	15-16%	17%
18-end	-----	17-10%
Energy Level	High	High
Feed conversion	2.7-3.4 lbs. feed/ lb. gain	4.0-4 lbs. feed/ lb. gain
Age of caponization	6-9 weeks	3-4 weeks
Cost of caponization	6-7¢/bird	8-10¢/bird
Cost of production	18-23¢/lb.	20-25¢/lb.
Largest production problem	Breast blisters	Breast blisters
Market age	12-15 weeks	19-21 weeks
Market weight	7-8 lbs.	9-10 lbs.

<sup>a</sup> Only male birds are considered; females sold as broilers.

<sup>b</sup> Esmopal - This information was supplied by Dr. W. J. Stadelman, Department of Poultry Science, Purdue University, Lafayette, In., 47907.

<sup>c</sup> Surgical - This information was supplied by Mr. J. L. Skinner, Department of Poultry Science, 107 Hiram Smith Annex, University of Wisconsin, Madison, Wi., 53706.



Table 4. Roaster production facts as obtained from consultants.

Production item	Stadelman <sup>a</sup>	Skinner <sup>b</sup>
Unit size	2,500 and up	3,000-5,000
Breed or strain	Hubbard White Mountain	Hubbard, Arbor Acres, Cobb
Housing type	Environmental Control	Broiler type
Housing cost		\$1.30/sq. ft.
Floor space	2-2.5 sq. ft.	1.6-2.0 sq. ft.
Feeder space	2.0-3.0"	2.0-3.0"
Waterer space	0.4-0.5"	0.4-0.5"
Roosts	None	None
Equipment cost		\$ .40/bird
Litter type	Crushed peanut hulls	Shavings
Lighting program	.5-.75 ft. candles of subdued light for 14-16 hrs./day	24 hr. light to start, drop to natural light or 7½ watt bulbs
Vaccination program	None	None
Debeaking program	None	None
Feeding program		
Protein level <sup>c</sup>		
0-4 weeks	21-22%	22%
4-8 weeks	18-19%	20%
8-end	15-16%	17%
Energy level	High	High
Feed conversion	2.7-3.4 lbs. feed/ lb. of gain	2.7-2.8 lbs. of feed/ lb. of gain
Pigmentation	Yellow	Yellow
Cost of production		
Male		20¢/lb.
Female (broiler)		



Table 4 (con't). Roaster production facts as obtained from consultants.

Production item	Stadelman <sup>a</sup>	Skinner <sup>b</sup>
Largest production problem	Breast blisters	Breast blisters
Market age		
Male	14-16 weeks	14-15 weeks
Female (broiler)	8-10 weeks	8-10 weeks
Female (Cornish hen)	5-5½ weeks	5-5½ weeks
Market weight		
Male	6 lbs.	7 lbs.
Female (broiler)	3.5-4.0 lbs.	3.5-4.0 lbs.
Female (Cornish hen)	1-1.5 lbs.	1-1.5 lbs.

<sup>a</sup> This information supplied by Dr. W. J. Stadelman, Department of Poultry Science, Purdue University, Lafayette, In., 47907.

<sup>b</sup> This information supplied by Mr. J. L. Skinner, Department of Poultry Science, 107 Hiram Smith Annex, University of Wisconsin, Madison, Wi., 53706.

<sup>c</sup> Both consultants agreed that lower protein levels in the finishing rations improved the finish of the bird but growth is sacrificed.



Table 5. Specialty poultry processing facts as obtained from consultants.

Processing item	Consultant		
	Stadelman <sup>a</sup>	Skinner <sup>b</sup>	Baker <sup>c</sup>
Dress out yield			
Capons	80%	78%	
Roasters	78%	76%	
Fresh vs. frozen			
Capons	Crust frozen- fresh or frozen	Frozen	Frozen
Roasters	Crust frozen- fresh or frozen	Frozen	Frozen
Package preference			
Capons	Shrinkable polyethylene	Need work	Need to be more appeal- ing - 6/box
Roasters	Shrinkable polyethylene	Need work	Need to be more appeal- ing
Shelf life			
Capons	0.5-1 yr.	0.5-1 yr.	
Roasters	0.5-1 yr.	0.5-1 yr.	
Cost			
Capons	8-10¢/lb.	8-10¢/lb.	
Roasters	8-10¢/lb.	8-10¢/lb.	
Scald temperature			
Capons	129-130° (2- 2½ min.)	128°	
Roasters	129-130°	130°	

<sup>a</sup> This information supplied by Dr. W. J. Stadelman, Department of Poultry Science, Purdue University, Lafayette, In., 47907.

<sup>b</sup> This information supplied by Mr. J. L. Skinner, Department of Poultry Science, 107 Hiram Smith Annex, University of Wisconsin, Madison, Wi., 53706.

<sup>c</sup> This information supplied by Dr. R. L. Baker, Poultry Economist, Ohio State University, Columbus, Oh., 43210.



Table 6 (con't). Specialty poultry marketing facts as obtained from consultants.

Marketing item	Consultant		
	Stadelman <sup>a</sup>	Skinner <sup>b</sup>	Baker <sup>c</sup>
Transportation system			
Capons			Small lots
Roasters			Part trucklots
Broilers			Trucklots
Competition			
Capons	Nothing	Nothing	Turkeys
Roasters	Fryer-roaster turkey		Fryers, fryer-roaster turkey
Broilers			Roasters
Market value			
Wholesale			
Capons			
Roasters			See Table 7
Broilers			19-31¢/lb.
Retail			
Capons		69-79¢/lb.	69-79¢/lb.
Roasters	45-59¢/lb.	45-59¢/lb.	45-59¢/lb.
Broilers			22-35¢/lb.
To producer			
Capons			
Roasters	25-35¢/lb.	22-33¢/lb.	
Broilers		10-25¢/lb.	

<sup>a</sup> See Footnote a, Table 5.<sup>b</sup> See Footnote b, Table 5.<sup>c</sup> See Footnote c, Table 5.



Table 6. Specialty poultry marketing facts as obtained from consultants.

Marketing	Consultant		
	Stadelman <sup>a</sup>	Skinner <sup>b</sup>	Baker <sup>c</sup>
Location and rank of potential entry			
Capons	Local New York-Boston Chicago	Local Northeast Chicago	Local Northeast Chicago
Roasters	Local New York-Boston Chicago		Local New York-Boston Chicago
Broilers	National	National	National
Market stability and size			
Capons	Must be developed	Must be developed	Limited
Roasters	Must be developed	Must be developed (1 bird/ capita possible)	Limited
Broilers	Variable price but large	Variable price but large	Variable price but large
Seasonality			
Capons	Nov.15-Dec.20	Oct.-Dec.	Oct.-Dec.
Roasters	Nov.15-Easter	Oct.-April	Oct.-April
Broilers	Year around	Year around	Year around
Method (all involve pre-production marketing agreements)			
Capons		Chains	Wholesalers and chains
Roasters		Wholesalers and chains	Major meat packers, wholesalers and chains
Broilers		Wholesalers and chains	Wholesalers and chains



Table 7. Average wholesale selling prices of frozen ready-to-cook roasters at New York.<sup>a</sup>

Year	Cents/pound				
	4 lb.	4.5 lb.	5 lb.	5.5 lb.	6 lb.+
1960	31.03	34.49	--	--	-- <sup>b</sup>
1961	29.11	32.32	36.11	38.44	39.67
1962	31.60	34.89	38.20	40.16	42.08
1963	29.83	32.89	37.10	39.27	41.88
1964	29.17	33.84	36.33	38.57	40.51
1965	31.40	35.28	38.34	39.87	41.87
1966	32.74	36.29	41.41	42.92	44.02
1967	31.80	36.11	41.05	41.98	43.02
1968	33.38	35.21	41.53	43.54	45.09

<sup>a</sup> Submitted by Dr. R. L. Baker, Ohio State University, as compiled from annual issue of Poultry Market Statistics.

<sup>b</sup> 6 lb. price instead of 6 lb.+.

Table 8. Production results for specialty poultry Experiment 1.

Treatment	Sex	<sup>a</sup>					
		Age					
		8 weeks		11 weeks		16 weeks	
		Wt.	Feed/gain	Wt.	Feed/gain	Wt.	Feed/gain
Control	M	4.16	2.70	5.34	2.86	8.40	3.54
Esmopal	M	4.20	2.64	5.48	2.77	8.66	3.42
Control	F	3.32	2.65	4.07	3.41	6.21	4.63
Esmopal	F	3.34	2.62	3.98	3.47	6.53	4.56
Surgical capons		Caponizations were not successful					

<sup>a</sup> A total mortality of 5% was recorded from 0-16 weeks of age.

Table 9. Production and processing results for specialty poultry Experiment 2.

	Males 8 weeks	Females 8 weeks	Females 10 weeks	Females 12 weeks	Males 12 weeks	Males (Esmopal) 14 weeks	Males 14 weeks
Production							
Ave. live wt.	3.90	3.22	4.18	5.28	6.64	7.96	7.74
Feed Conversion	2.32	3.09	3.30	3.48	2.96	3.46	3.50
Mortality, %	2.4	2.2	2 wk.period 0	4 wk.period 0	4 wk. period 2.8	6 wk.period 8.5	6 wk. period 0
Processing							
Dressing, %	67.3	67.0	69.47	70.70	69.69	68.90	67.25
Necks, %	3.6	3.5	3.3	3.09	3.5	3.09	3.15
Livers, %	1.6	1.6	1.9	1.5	1.8	1.5	1.5
Gizzards, %	2.4	2.83	2.5	2.5	2.6	1.6	1.6
Hearts, %	.65	.46	.47	.43	.60	.52	.55
Total giblets, %	8.25	8.39	8.17	7.52	8.50	6.71	6.80
Defects							
Knobs, %	5.8	2.2	6.8	2.0	8.8	12.9	23.5
Bruised keels, %	5.8	0	9.0	6.3	20.5	12.9	20.5
Breast blisters, %	0	0	2.2	0	8.8	6.5	29.4
Total breast defects, %	11.6	2.2	18.0	8.3	38.1	30.3	73.4



Table 10. Roaster production report from Nebraska Turkey Growers Coop. Assn.

Production item	Results	
	Method	Costs & Returns
Flock size	1200 @ 9¢	\$ 108.00
Breed	Cornish rock	
Sex	Mixed (♂♀)	
Mortality	24 = 2%	
Housing		
Brooding	Batteries (4 wk.)	
Rearing	Litter-floor	
Floor space	1500 sq. ft. = 1.25/bird	
Litter	Shavings	34.07
Fuel	Propane	45.60
Equipment		
Feeders	Round hanging 1.5"/bird	
Waterers	Round 0.3"/bird	
Management		
Debeaking	None	
Vaccination	None	
Lighting	Electric, 24 hr.	
Feeding	Commercial feed	1304.95
Starter (0-6 wk.)	20% protein	
Grower(6-11 wk.)	15% protein	
Conversion	4.35 lb. feed/ 1 lb. gain	
Market age	11 weeks	
Market wt., live	4.82 lbs. av.	
Processing		
Dressed wt.	4.02 lbs. av.	
Dressing percentage	80.7	
Grade	See Table 11	
Condemnations	3.3%	
Total marketable product	4571 lbs.	
Cost	10¢/lb.	457.10
Market	Individuals	
Market value	45¢/lb.	\$2056.95
Costs (out-of-pocket)		1949.72
Returns over out-of-pocket costs		117.23

Table 11. Roaster processing report from Nebraska  
Turkey Growers Coop Ass'n.<sup>a</sup>

Processing item	Results
Number processed	1200
Shackle requirements	Turkey shackles
Line speed	
Scald temperature	131° - 135°
Dressing percentage	80.7
Dressed wt. av.	2.75 - 3.5 (3 lb. av.)
Grade	
A	55%
B	8%
C	37% - caused by breast and leg defects
Condemnations	2 birds (fell out of shackle)
Processing problems	Training personnel
Processing costs	
plain bag, plain insert + good box	10¢/lb.
Disposition	Selling to individuals

<sup>a</sup> Recommended that undergrades be cut up to return A grade price.