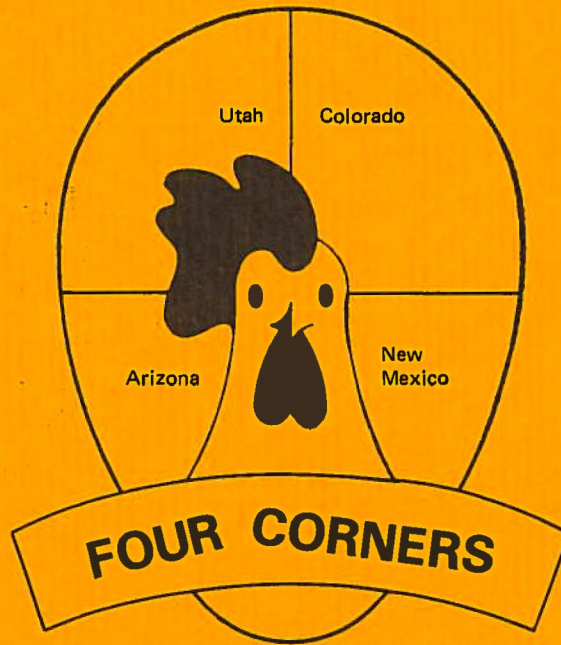


UCSU 5/57.2/EG3/1971
c. 1

COLORADO STATE PUBLICATIONS LIBRARY
UCSU5/57.2/EG3/1971 local
Quarles, Carey L./Egg production feasabi



3 1799 00000 6866



EGG PRODUCTION FEASIBILITY STUDY OF THE FOUR CORNERS AREA

Final Report - August 1971

by

Carey L. Quarles

Howard L. Enos

Department of Avian Science
Colorado State University
Fort Collins, Colorado 80521

\$601-366-044

COLORADO STATE UNIVERSITY
DEPARTMENT OF AVIAN SCIENCE

FINAL RESEARCH REPORT

Project: 1025

Title: Egg Production Feasibility Study,
of the Four Corners Area

Submitted to: Mr. Carl A. Larson
Natural Resource Officer
Four Corners Regional Commissioner
Farmington, New Mexico 87401

Submitted by: Carey L. Quarles, Ph.D. and
Howard L. Enos, Ph.D.
Department of Avian Science
Colorado State University
Fort Collins, Colorado 80521

This study was funded in part
by the Four Corners Regional Commission
through a Technical Assistance Contract -
FCRC Project No. 201 - 366 - 044

TABLE OF CONTENTS

| | Page |
|--|------|
| Introduction | 1 |
| Objectives | 1 |
| Procedure | 2 |
| Results and Discussion | 3 |
| Geographical Boundaries | 3 |
| Population Within Boundaries | 3 |
| Egg Consumption | 6 |
| Present Source of Eggs | 6 |
| Expansion Programs | 7 |
| Egg Price Comparisons | 8 |
| Demand for Local Eggs | 10 |
| Farm Location | 10 |
| Housing | 11 |
| Equipment | 18 |
| Availability and Feed Prices | 20 |
| Feed Ration Formula | 24 |
| Cost of Production | 25 |
| Marketing | 28 |
| Summary and Conclusions | 31 |
| Acknowledgements | 36 |

LIST OF TABLES

| <u>Table</u> | | <u>Page</u> |
|--------------|---|-------------|
| 1 | Populations Within Boundaries | 5 |
| 2 | Egg Price Data | 9 |
| 3 | Estimated Equipment Cost per Unit | 19 |
| 4 | Average Local Retail Cost of Feedstuffs | 20 |
| 5 | Estimated Cost of Mix-Mill System | 23 |
| 6 | Estimated Prices of Feed Ingredients | 24 |
| 7 | Ingredients for Cage Layer Ration | 25 |
| 8 | Calculated Initial Investment | 26 |
| 9 | Cost and Income Analysis | 27 |

LIST OF DIAGRAMS

| <u>Diagram</u> | | <u>Page</u> |
|----------------|---|-------------|
| 1 | Geographical Boundaries | 4 |
| 2 | Diagram of Proposed Farm Location | 13 |
| 3 | Picture of Proposed Farm Location | 13 |
| 4,5,6,7 | House Plans | 14,15,16,17 |
| 8 | Picture of a Mix-Mill Feed System | 22 |

INTRODUCTION

The Southern Ute Indians located in the Four Corners area of Colorado, Arizona, New Mexico and Utah have been investigating various profitable enterprises that would enable them to raise their standard of living and provide needed employment.

Since there are only a few small egg producers in the Four Corners area and these units are below efficient economic size, eggs are generally imported from California. For the above reasons, at the request of the Southern Ute Indian Council through Mr. Leon Hopkins and the Four Corners Regional Commission, a study was conducted in 1970-71 by the Department of Avian Science of Colorado State University to determine the feasibility of establishing an egg production unit by the Southern Ute Indians. This research report is the result of this study.

Objectives of the Study:

- (1) To determine the feasibility of producing eggs in Southwestern Colorado, determination of market potential and geographical boundaries, population within the area, approximate egg consumption, present sources and price of eggs.
- (2) To determine cost of production for the purpose of comparison with other regions now serving the market area.
- (3) To determine the feasibility of a marketing organization and adequate supporting facilities.

Procedure:

- (1) The geographical boundaries for this study will be defined as basically Four Corners Area (FCA) of Colorado, Arizona, New Mexico and Utah.
- (2) Sales potential within the FCA will be determined by:
 - a. Present population
 - b. Egg consumption potential
 - c. Data on present egg prices will be collected and evaluated
- (3) Cost of eggs to retailers will be determined, including present sources of eggs and transportation costs.
- (4) Disposable income, population movements and demand for local eggs as compared to demand for eggs from other regions will be evaluated.
- (5) Production possibilities will be studied by:
 - a. Costs of production will be estimated in order to determine whether eggs can be produced competitively in this area
 - b. Possibilities for cooperative buying to meet the demand for replacement pullets, chicks, feed and equipment will be determined
 - c. Physical facilities necessary for specialization in pullet raising, feed manufacturing, manure removal, processing and marketing of eggs and spent fowl will be determined and specified

- d. Amounts of capital needed will be estimated and sources thereof suggested
- (6) Economics of marketing and size.
- a. Approximate size and number of operations needed to assure an economical unit will be determined for individuals and/or for an organization which can meet the area needs
 - b. Marketing costs for these units will be estimated
- (7) If egg production and marketing are feasible in this area, a marketing agency of a type agreeable with the future producers and buyers will be organized, contracts formulated and assistance will be given in working with the retailers for promotion and marketing eggs and fowl.

Results and Discussion:

Geographical Boundaries

Diagram 1 outlines the geographical boundaries of this study and is defined as basically the Four Corners Golden Circle area of Colorado, Arizona, New Mexico and Utah.

Population Within Boundaries

In order to determine the actual marketing potential in the Four Corners area, the populations of the various counties and cities were compiled and are listed in Table 1.

TABLE 1

Populations Within Boundaries

| <u>State</u> | | |
|--------------|------------|---------------|
| Colorado | Montezuma | 12,604 |
| | LaPlata | 18,977 |
| | Archuleta | 2,581 |
| | San Juan | 811 |
| | Hinsdale | 394 |
| | Dolores | 1,550 |
| | San Miguel | <u>1,763</u> |
| TOTAL | | 38,680 |
| New Mexico | San Juan | 48,200 |
| | Rio Arriba | 23,800 |
| | McKinley | <u>42,000</u> |
| TOTAL | | 114,000 |
| Arizona | Apache | 45,941 |
| | Navajo | <u>32,231</u> |
| TOTAL | | 78,172 |
| Utah | Grand | 6,572 |
| | San Juan | <u>9,478</u> |
| TOTAL | | 16,050 |
| GRAND TOTAL | | 246,902 |

The larger cities within this boundary are listed below with the 1970 populations.¹

| <u>City</u> | <u>Population</u> |
|-------------------|-------------------|
| Cortez, Colorado | 5,675 |
| Durango, Colorado | 10,349 |
| Farmington, N. M. | <u>26,500</u> |
| TOTAL | 42,524 |

Egg Consumption

Within the FCA the total population is 246,902 according to the 1970 census. Since many of these people are in the low income families, it is estimated that approximately one-half of this population could actually be considered as potential egg consumers. Therefore, it is estimated that total marketing potential for the FCA should be large enough to support around 100,000 to 125,000 layers.²

Present Source of Eggs

The greatest percentage of eggs sold commercially in the FCA are shipped in by truck from California. A few small flocks of layers are located in the FCA, but there are not enough eggs produced locally to interfere with a production by the Southern Ute Indians. Therefore, the competition for markets in the FCA are egg producers in California.

¹Bureau of Vital Statistics of Colorado, Arizona, New Mexico and Utah

²Based on egg consumption data by the U.S.D.A.

Expansion Programs

To determine if egg production units near the FCA would be in competition with such a unit as being evaluated in this study and to discuss expansion plans in the four state area, a meeting was held in Denver, Colorado, on January 19, 1971, to consider the following subjects:

- (1) A progress report by Drs. Howard Enos and Carey Quarles of the Colorado egg feasibility study, its purpose and goals.
- (2) Report from Mr. Joe Williams of New Mexico State University concerning the outlook for poultry expansion in New Mexico.
- (3) A report from Dr. Carroll Draper of Utah State University concerning poultry expansion programs in Utah.
- (4) Arizona State University was unable to send a representative; however, personal contact by phone was made to obtain similar information on expansion in that state.
- (5) Mr. Carl Larson of the Four Corners Regional Commission actively participated in these discussions, especially as related to the overall economic situation of the Four Corners area.

It was rather obvious during the course of this very informative meeting that the long-range program being proposed under the direction of Mr. Joe Williams from New Mexico has a

potential but will not enter into the egg supply situation in the near future. The report from Dr. Carroll Draper indicated that there is currently new growth in commercial egg production in Salt Lake Valley, and these eggs could possibly be in direct competition with any new production from the Four Corners area; however, currently, one must recognize that new production immediately would be in direct competition with the present supply of eggs from California. There was, however, indication that the egg production being planned in Salt Lake Valley would not become surplus for that area itself. Therefore, this production unit will possibly not be seeking a market as far away as Durango, Cortez and Farmington. The conclusion from this meeting was that providing feed cost can be brought into line with competitive production areas throughout the West, locally produced eggs can be marketed and an egg production enterprise may be feasible for the Four Corners area. It was also concluded that at the present, there does not appear to be any large egg production units that would be in direct competition with such a unit as being considered for the Ute Indians.

Egg Price Comparisons

On various dates egg prices at retail supermarkets in Durango were collected and compared to similar markets in the Denver area. The summary of these data is shown in Table 2.

TABLE 2

Egg Price Data

| Month | Egg Size | Quality | Average Price Per Dozen | | Difference |
|-----------|-----------|---------|--------------------------------|--------|------------|
| | | | Durango | Denver | |
| Aug. 1970 | Ex. large | AA | \$.56 | \$.54 | + .02 |
| | Large | AA | .52 | .50 | + .02 |
| | Medium | AA | .44 | .42 | + .02 |
| Dec. 1970 | Ex. large | AA | .55 | .53 | + .02 |
| | Large | AA | .52 | .50 | + .02 |
| | Medium | AA | .42 | .40 | + .02 |
| Feb. 1971 | Ex. large | AA | .58 | .60 | - .02 |
| | Large | AA | .55 | .56 | - .01 |
| | Medium | AA | .48 | .49 | - .01 |
| May 1971 | Ex. large | AA | .51 | .48 | + .03 |
| | Large | AA | .49 | .46 | + .03 |
| | Medium | AA | .45 | .42 | + .03 |
| AVERAGE: | Ex. large | | .55 | .537 | |
| | Large | | .52 | .505 | |
| | Medium | | .427 448 .427 | .432 | |

As shown in Table 2, on three out of the four sampling price dates, retail egg prices for Durango stores were higher than for similar stores in the Denver area. The average prices for the four different dates indicated that retail egg prices for Grade AA large eggs run approximately \$.015 higher in the Durango stores than in the Denver stores. This is probably due to transportation cost of shipping eggs into this area.

Demand for Local Eggs

A survey was made to obtain information on the demand for local eggs versus eggs shipped in from California. Restaurants, Sago Food Service and City Food Markets were contacted as to demand for local eggs. All of the persons contacted indicated that they would be interested in buying local eggs, provided that the price per dozen was similar and if the supply was large enough to meet their demands. Safeway Markets (the largest buyer in the FCA) stated that normally they do not purchase local eggs; however, they would consider buying eggs from an egg production unit in the FCA if the unit was large enough to justify a U.S.D.A. inspector. This would require a minimum of 1,000 cases a week or approximately 100,000 layers.

Farm Location

One phase of this study was to select possible locations for a farm site and to study climatic conditions in order to determine the types of construction need for the FCA. Factors investigated are listed as follows:

- (1) Locations and distances from major marketing areas
- (2) Road accessibility of farm locations
- (3) Type of land and drainage
- (4) Climate (temperature ranges, snow and rainfall, et cetera)

After evaluating all factors, it would appear more feasible to locate and construct one large layer farm (with several family units) rather than have individual units on several different locations. By constructing all laying units on one farm, a feed mixing mill could be utilized more efficiently and furnish feed at less cost since no feed would have to be delivered off the farm.

With the help of Mr. Leon Hopkins, Agent in Charge of the Southern Ute area, several possible locations were investigated. The site selected for the laying unit, if found feasible, is located near Ignacio, Colorado. Diagram 2 shows the distance of this location from the three largest cities in the FCA. Diagram 3 shows the type of land and farm site selected.

Housing

Several meetings were held with Mr. Ralph Hansen, Extension Agricultural Engineer, Mr. Leon Hopkins and poultry house specialists to study, develop and design a type of cage layer house suitable for the FCA. After evaluating all the data, Mr. Ralph Hansen designed the proposed cage layer house as shown in Diagrams 4, 5, 6 and 7. The overall plan design calls for the following specifications:

House size: 186 X 40 feet
Cage size: 12 X 16 inches
Capacity: 10,240 layers (4 birds/cage)
Ventilation: one fan - 3,500 cfm
four fans - 11,320 cfm each
Ceiling load: 10 PSF
Roof load: 30 PSF (Dead + L.L.)

The estimated cost for the above building (186 X 40 feet) is \$24,500 per unit. This would calculate a cost of \$2.39 per layer housed.

Diagram 2

Diagram of Proposed Farm Location

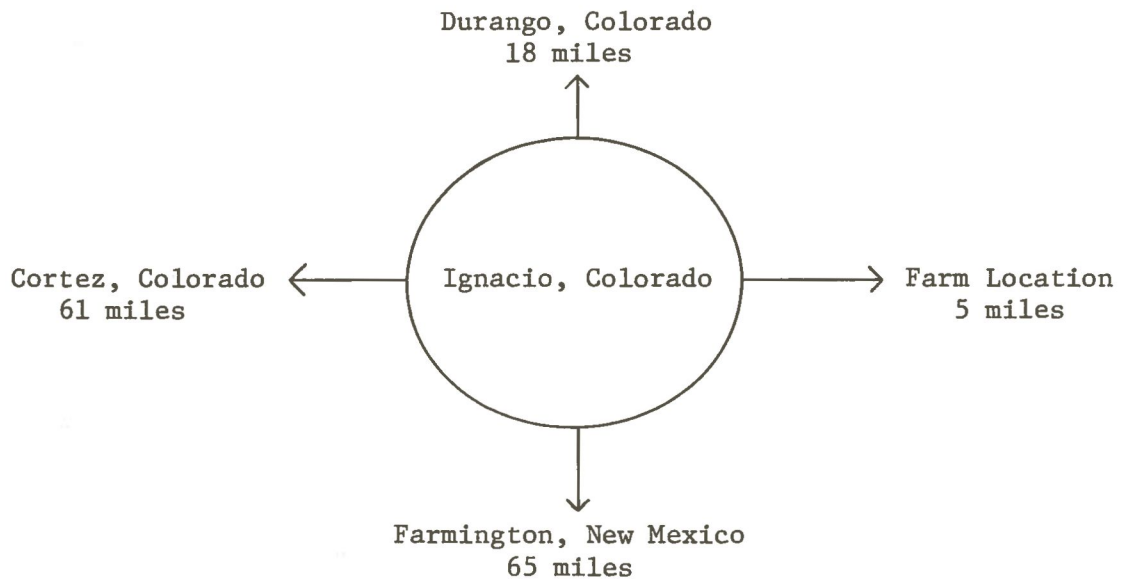
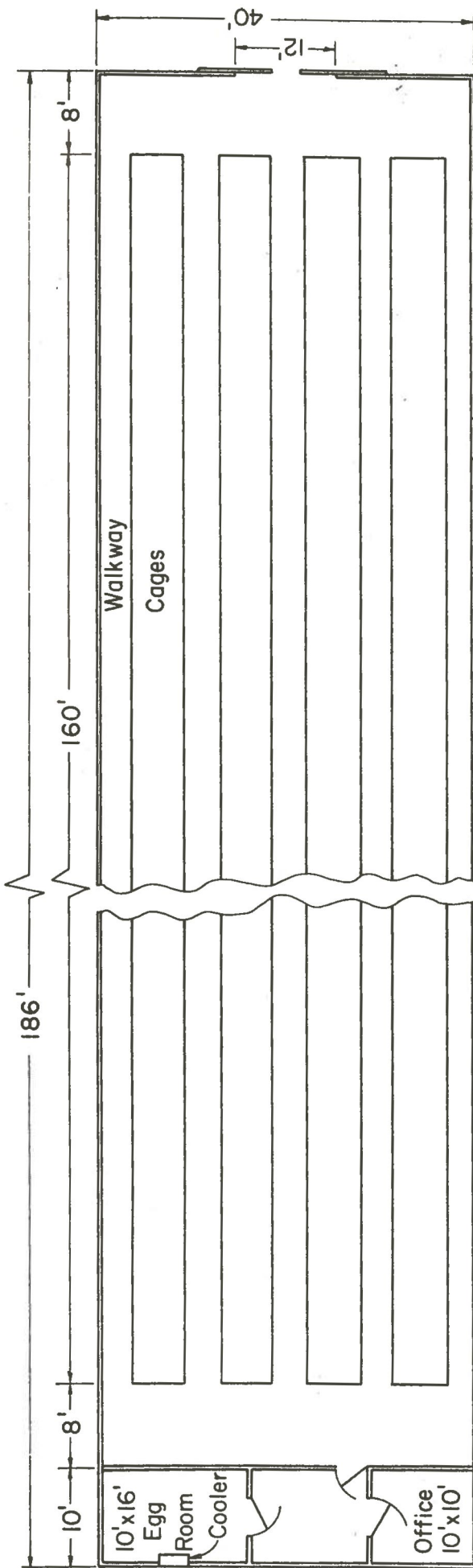


Diagram 3

Picture of Proposed Farm Location

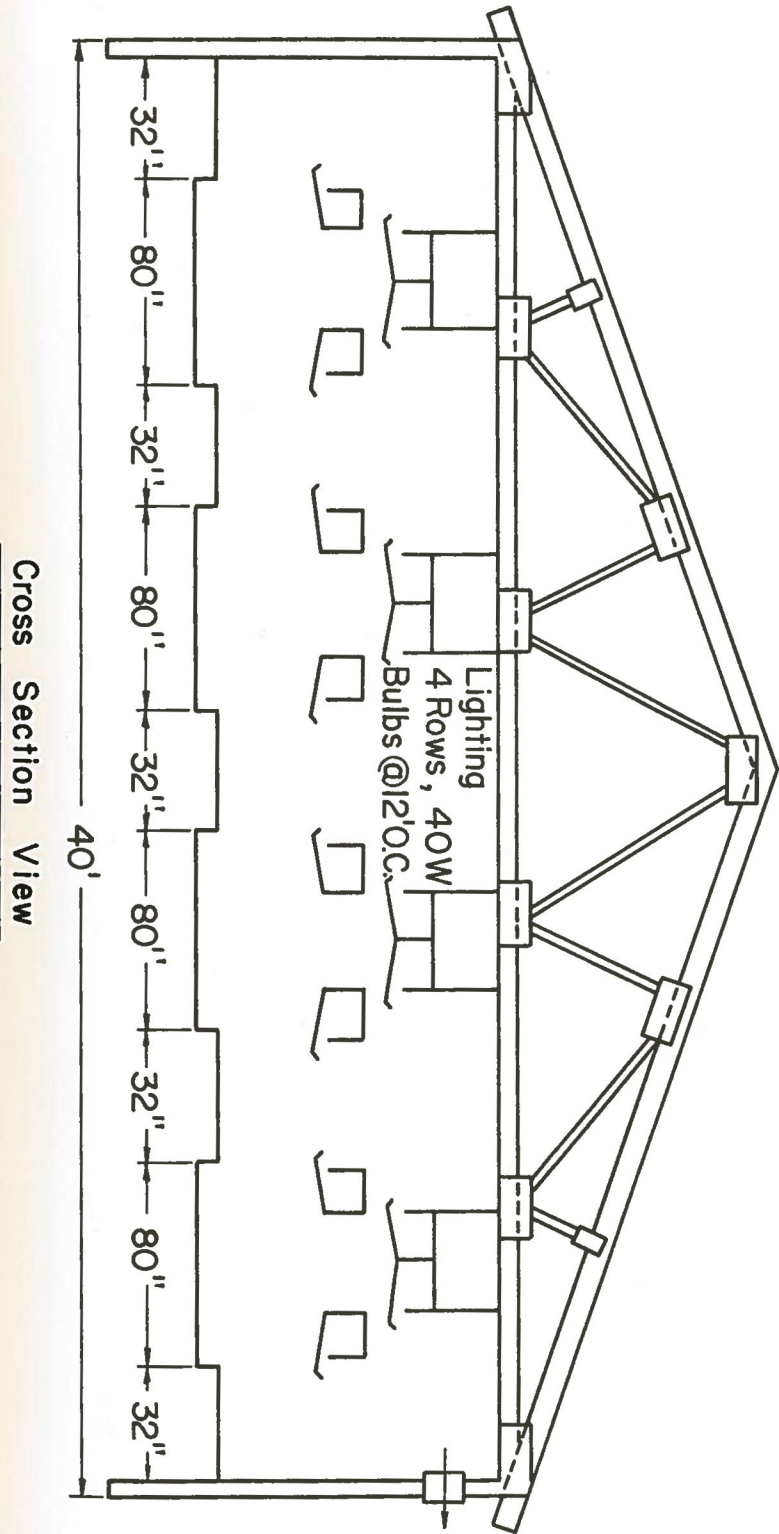
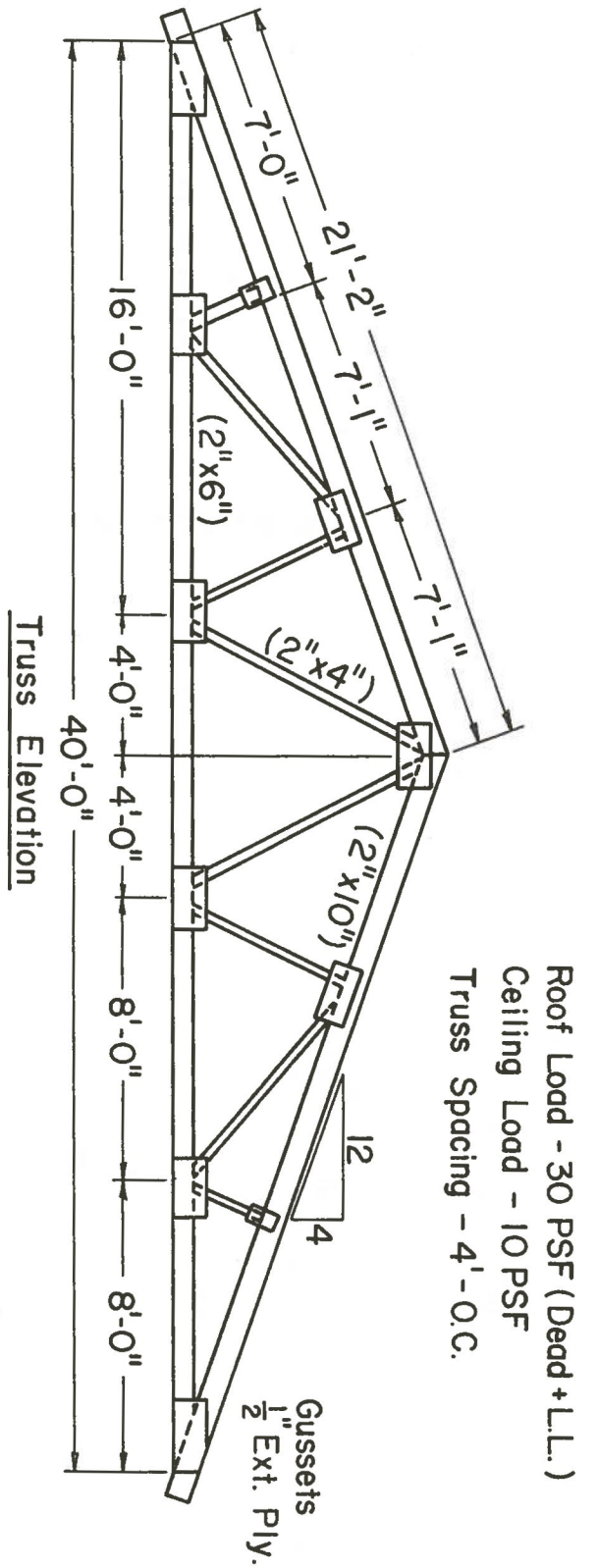


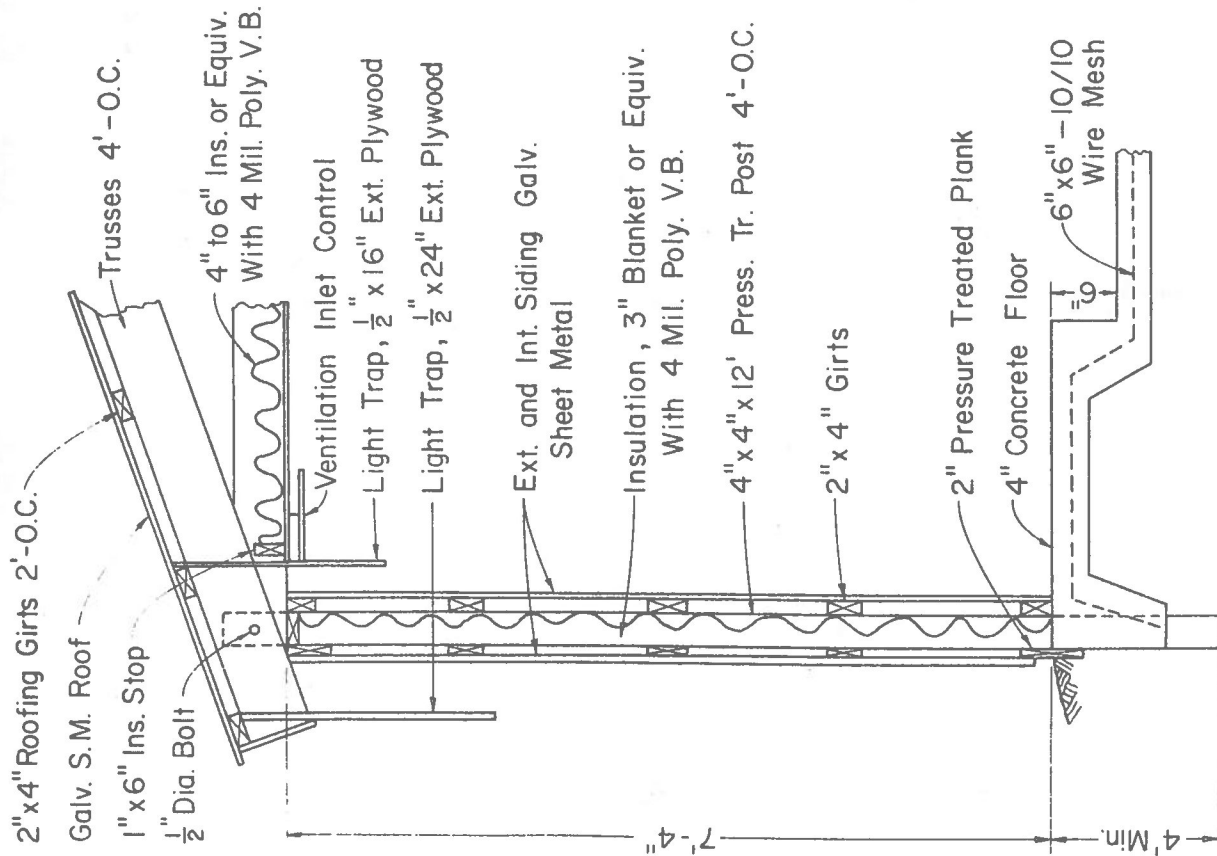


Note: Not to Scale

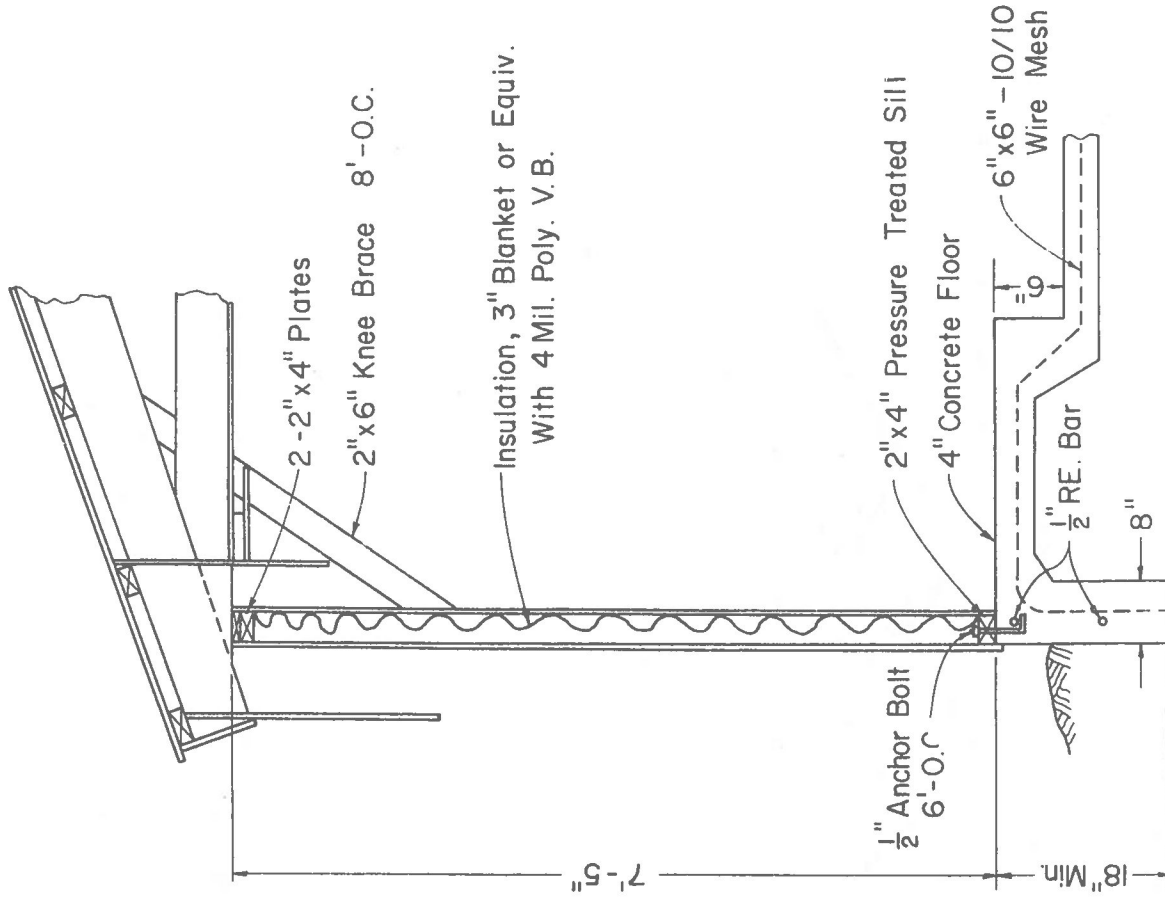
Removable Wall Panels 3 / Wall

Floor Plan for 40' x 186' Cage Laying House
10,240 with 4 Birds / 12" x 16" Cage

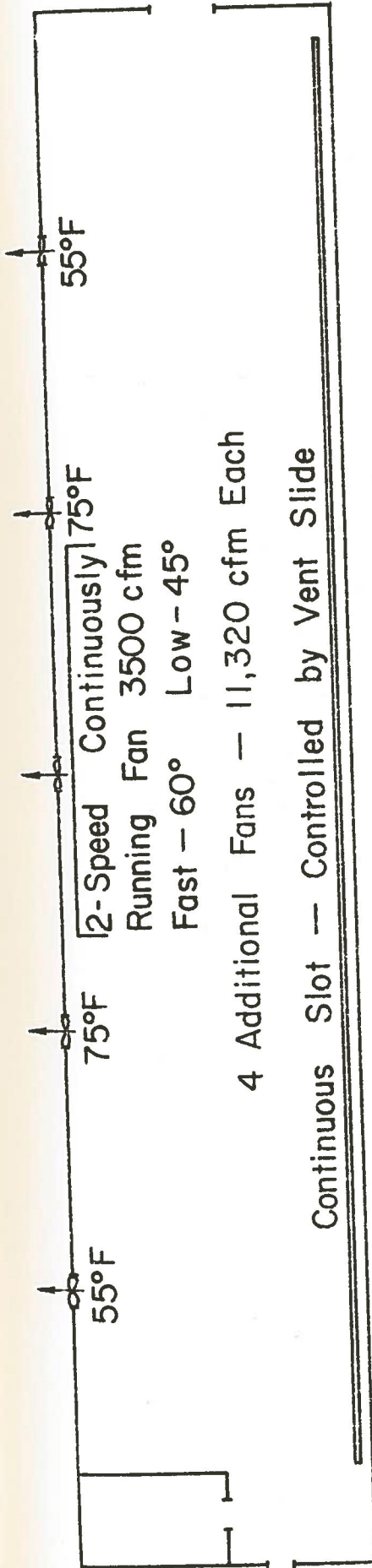




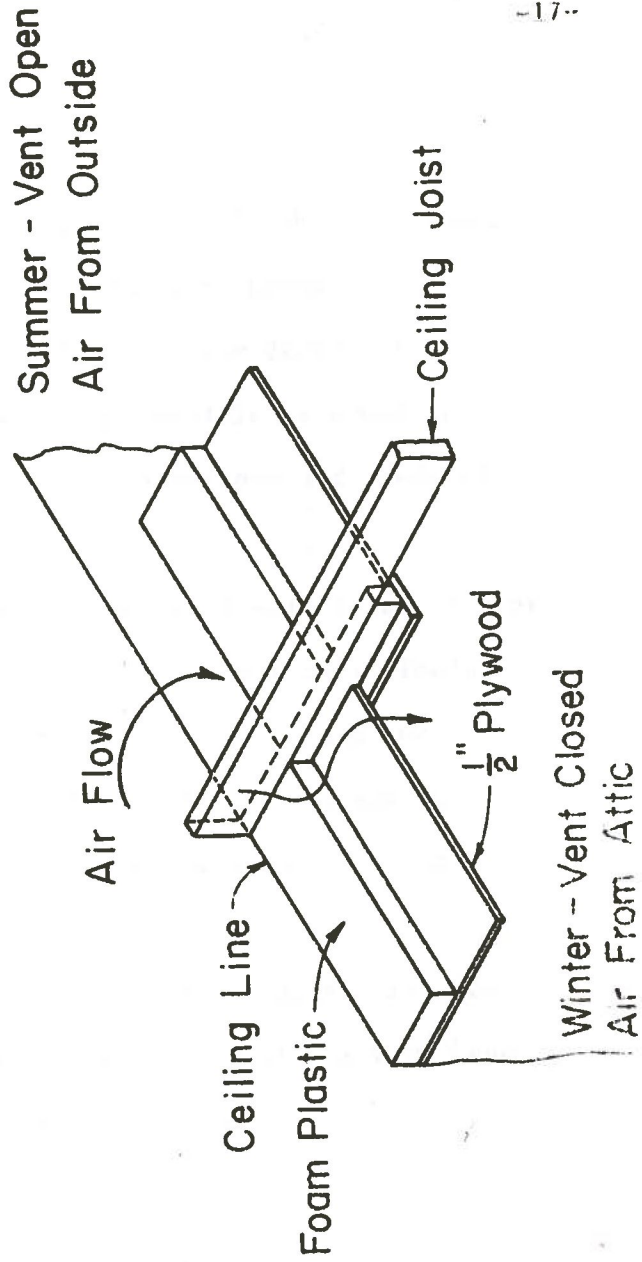
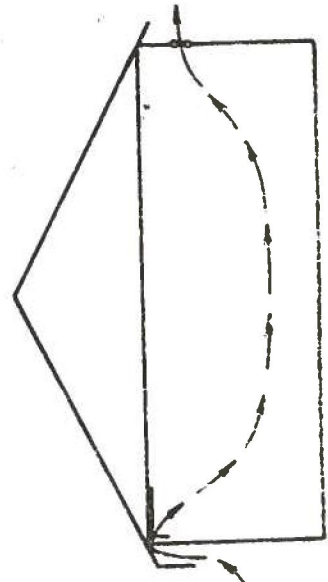
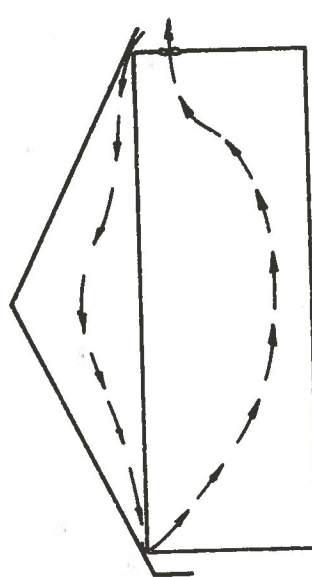
Cross Section - Pole Construction



Cross Section - Frame Construction



Ventilation Plan



Inlet Vent Detail

Equipment

At a meeting in Ignacio on March 3, 1971, which included Mr. Leon Hopkins, Mr. Evan Stevens, Mr. Carl Larson, Dr. Howard Enos and Dr. Carey Quarles, it was decided that if this project was recommended as being feasible, a complete automatic system would best suit the conditions and needs of the Southern Ute Indian producers.

Over twenty poultry equipment companies were contacted for information on designs and prices of cages, waterers, feeders, egg processing, egg handling, and manure removal equipment. All of this information was studied and evaluated, and an overall equipment plan was designed for an automatic control environmental cage layer house.

Table 3 shows the approximate cost of equipment for one cage layer unit for 10,240 cage layers. Quotations were based on May 1971 prices and are subject to change.

TABLE 3

Estimated Equipment Cost Per Unit
(10,240 Cage Layers)

| | | | |
|----------------------------------|--|-----------------|-----------------|
| Cages: | Cage size of 12 X 16 inches with automatic feeder Cage density of 4 layers per cage 2,560 cages @ \$1.36 | | \$3,481.60 |
| Water System: | Hart cage system complete (2,560 water cups) | | 1,245.27 |
| Ventilation System: | | | |
| | 4 - 42 inch, 1/2 H.P. fans (11,320 cfm) | | |
| | 1 - 24 inch, 1/2 H.P. fan (5,600 cfm) | | |
| | 5 - shutters | | |
| | 5 - thermostats | | 1,130.40 |
| Manure Auger System: | | | 883.00 |
| Egg Cooler: | 12 X 12 X 7 room | | 368.00 |
| Tractor: | Inside manure removal | | 1,200.00 |
| Freight: | | | 900.00 |
| <hr/> | | | |
| Subtotal | | | \$9,208.27 |
| Unit share: | Tractor and manure spreader | \$ 600.00 | |
| (Based on | Egg processing | 2,560.00 | |
| 10 units) | Generator | 1,000.00 | |
| | Well | 300.00 | |
| | Feed Mill system | <u>3,540.00</u> | <u>8,000.00</u> |
| Grand Total | | | \$17,208.27 |
| Average Equipment Cost per layer | | | \$ 1.68 |

Availability and Prices of Feeds and Ingredients

It was learned through the Agricultural Extension Agent's office in Ignacio and Durango, Colorado, that corn, soybean and milo cannot be grown in the Durango area because of the short growing season. Wheat and alfalfa, and perhaps peas, can be grown satisfactorily.

Commercial feed companies in the FCA were contacted in October 1970, and Table 4 states the average price of feeds and feedstuffs.

TABLE 4

Average Local Retail Cost of Feedstuffs in Durango, Colorado

| <u>Item</u> | <u>October 1970</u> <u>Cost/100 lbs.</u> |
|---------------------|---|
| Wheat | \$2.60 |
| Corn | 3.25 |
| Barley | 2.70 |
| Milo | 2.85 |
| Soybean | 5.50 |
| Oats | 2.85 |
| 18% layer (bulk) | 4.50 |
| 36% supplement | 6.55 |
| Grinding and mixing | .40 |

It was obvious that an egg production operation could not compete with the present supplier of eggs (California producers) with buying local feeds or feed ingredients. Larger feed mills outside the FCA were contacted for prices on complete feeds delivered in bulk loads to Ignacio. The lowest price per ton for an 18% cage layer ration was \$80.00 per ton (May 1971 price). The lowest bid was obtained from Farmland Industries which operates mills in Cheraw and near Grand Junction.

In an attempt to reduce the estimated feed cost and enable an egg production operation to better compete for the markets, several feed mill manufacturers were contacted. Several designs were evaluated and Diagram 8 shows the type of feed mill system that would appear most feasible for this study. Table 5 states the estimated cost of such a system. (Prices, May 1971)

Diagram 8

Picture of a Mix-Mill Feed System

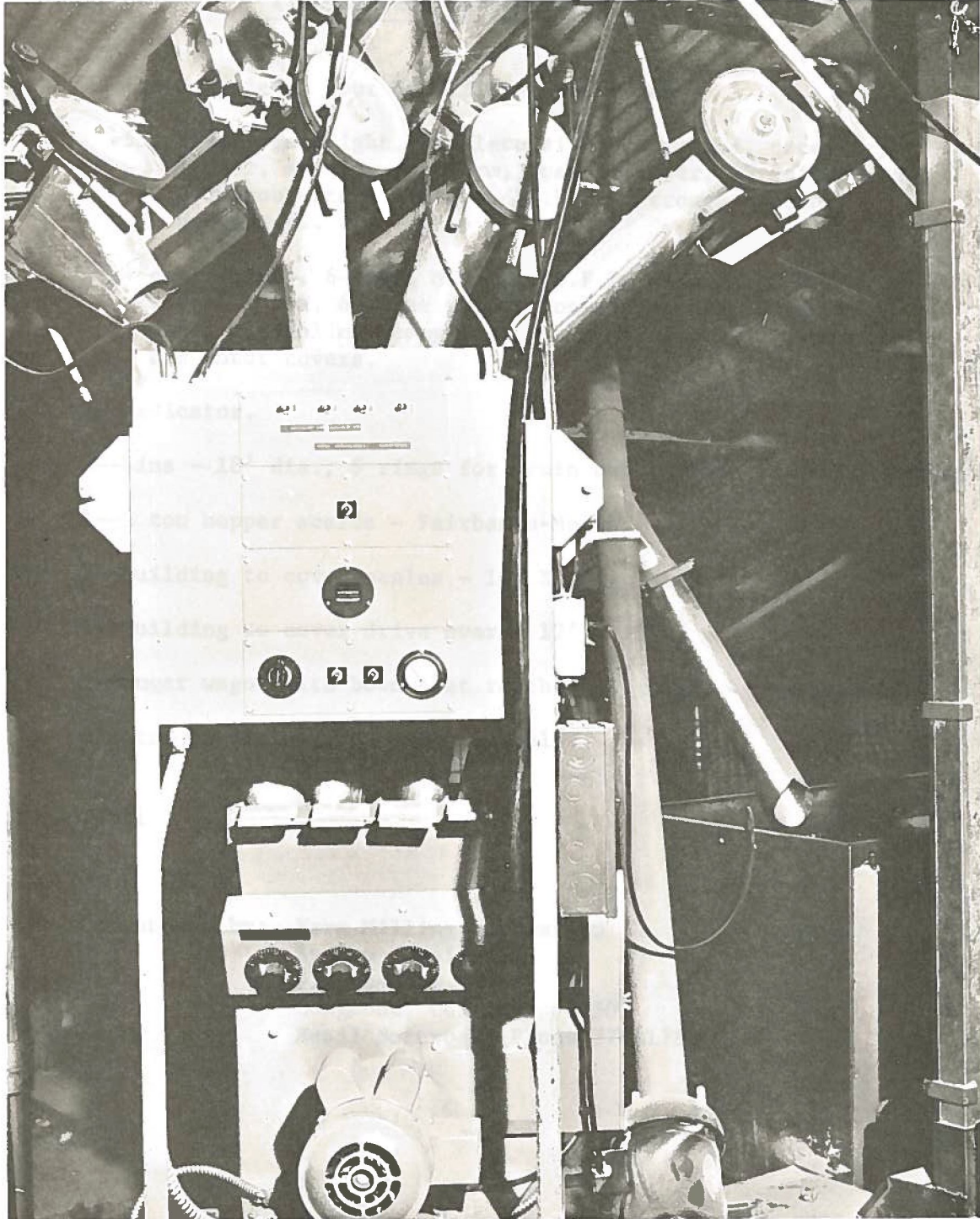


TABLE 5

Estimated Cost of a Mix Mill System
(100-125,000 Layer Capacity)

1--1,500 bu. each hour Mix Mill elevator leg.

55' discharge height, complete with 8-way head, necessary ladder, service platform, weather cover, 6" galvanized downspouts to 3 bins, and F.F.F. U-trough assembly and motors.

1--4-compartment, 6-tier, Mix Mill F.F.F. with 7 and H.P. single phase, 6-auger proportioner Mix Mill; 3 incoming auger assemblies, complete with control hoppers, motors and motor covers.

1--medicator.

3--bins - 18' dia.; 6 rings for grain and soybean oil meal storage.

1--5 ton hopper scales - Fairbanks-Morse.

1--building to cover scales - 10' X 10'.

1--building to cover drive over - 12' X 25'.

1--auger wagon with boom that reaches 19' high, 4 ton capacity.

Electrical wiring from close-by pole.

Total \$35,434.00

Quotations by: Farm Milling Automation
Systems Designing
916 Spencer
Longmont, Colorado 80501
Basil Norcross Phone 776-1786

Several grain brokerage companies throughout the four state area were contacted and information on prices for ingredients delivered to Ignacio was evaluated. Table 6 gives a summary of this information (Prices, May 1971).

Table 6
Estimated Prices of Feed Ingredients Per 100 Pounds
(Semi-Truck Loads)

| Item | - Company - | | | | | Average |
|---------|-------------|------|------|------|------|-------------|
| | A | B | C | D | E | |
| Corn | 2.95 | 3.15 | 3.10 | 2.97 | 2.90 | <u>3.00</u> |
| Milo | 2.75 | 3.15 | 3.00 | 2.70 | 2.84 | <u>2.88</u> |
| Soybean | 5.10 | 5.10 | 5.20 | 5.25 | 5.10 | <u>5.15</u> |
| Wheat | 2.60 | 3.00 | 2.85 | 2.55 | 2.70 | <u>2.74</u> |

Supplement (36% Protein) can be purchased in bulk loads at the price of \$4.95 per 100 pounds (average of four quotations - May 1971). This supplement could be purchased outside the FCA and delivered by truck to Ignacio.

Feed Ration

A commercial cage laying ration was formulated in order to calculate feed cost per ton. The following states the analysis of this ration:

| | |
|---------|-------|
| Protein | 18.0% |
| Fat | 2.5% |
| Fiber | 3.6% |

| | |
|----------------------|------|
| Calcium | 3.5% |
| Metabolizable Energy | 1210 |

Table 7 shows the amount of each ingredient that would be used in a mix-mill system and the estimated cost of producing a ton of an 18% cage layer ration. As stated in this table an ingredient cost per ton is \$75.75. It should be pointed out that this cost could be reduced slightly (about \$.75 per ton) by replacing around 20% of the milo or corn with wheat. The use of wheat in the laying ration could even be a greater factor in reducing feed cost during the season when the price of wheat is much less than corn or milo.

Table 7
Ingredients for a Cage Layer Ration
(18% Protein)

| <u>Ingredient</u> | <u>Percent</u> | <u>Pounds/Ton</u> | <u>Estimate Cost</u> | |
|--------------------|----------------|-------------------|----------------------|--------------|
| | | | <u>100 Pounds</u> | <u>Tons</u> |
| Ground Yellow Corn | 35.00 | 700 | \$3.00 | \$21.00 |
| Ground Milo | 25.55 | 511 | 2.88 | 14.72 |
| Soybean Meal (44%) | 24.30 | 486 | 5.15 | 25.03 |
| Supplement | <u>15.15</u> | <u>303</u> | 4.95 | <u>15.00</u> |
| Totals | 100.00 | 2000 | | \$75.75 |

Cost of Production

In calculating the cost of production the following assumptions were made:

- (1) Commercial egg operation will consist of 102,400 cage layers

(ten houses of 10,240 each). Eggs will be produced and processed at the same location. Eggs will be graded and cartoned for retail sale.

- (2) Layers will produce 20 dozen eggs per hen housed of which 92% is salable.
- (3) Feed consumption per layer will be 80 pounds of an 18% protein per year. Feed will be made by using a mix-mill system with a mixing capacity for 125,000 layers.
- (4) Taxes, interest expenses, insurance, and repair expenses are not included in the estimate.
- (5) Cost for land for this production unit is not included in this estimate.

Table 8 states the calculated initial investment per unit of 10,240 cage layers (Prices, May 1971).

Table 8

Calculated Initial Investment for
10,240 Cage Layers

| <u>Item</u> | |
|---------------------------------|--------------|
| Building (186' X 40') | \$ 24,500.00 |
| Equipment and Feed Mill System | 17,208.27 |
| Poultry, 10,240 layers @ \$1.80 | 18,432.00 |
| <hr/> | |
| Total Initial Investment | \$ 60,140.27 |
| Total Investment Per Layer | \$ 5.87 |

Table 9

Estimate Cost and Income Analysis

| <u>Factor</u> | <u>Cost</u> | <u>Cost on Hen- Housed Basis</u> |
|--|---|--------------------------------------|
| Feed | 80 lbs. per layer @ 3.9 Ingredient cost \$75.75 per ton Feed mixing cost \$2.25 | \$ 3.12 |
| Pullet | 20 week old ready to lay | 1.80 |
| Biologics | Vaccines, medication | .05 |
| Misc. Supplies | Supplies | .10 |
| Depreciation | Buildings (10 years) | .24 |
| | Equipment (10 years) | .17 |
| <hr/> | | |
| Total Cost per bird | | 5.48 |
| Income: | | |
| (a) 20 dozen per hen @ 31¢ per dozen (Estimate wholesale price) | | 6.20 |
| (b) Spent hens, 4# each, 90% liveability (3.6# @ 5¢ per lb.) | | .18 |
| <hr/> | | |
| Total Income per layer housed | | 6.38 |
| Estimated Income over cost per layer | | .90 |
| Estimated Income per unit (10,240 layers) | | \$9,216.00 |

Marketing

Considerable time was spent in evaluating the potential market for eggs produced by a commercial egg enterprise on the Southern Ute Indian Reservation at Ignacio, Colorado. Egg marketing and sales potential for various schools and colleges were studied. Conferences were made with Mr. Bill Lamba, Purchasing Director, Sago Foods, Inc., Menlo Park, California, who services schools in the FCA. After evaluating the number of resident students and their consumption potential, it was decided that this phase of the marketing system would have to be considered a secondary area. Egg movement studies through the major supermarket outlets in Durango, Cortez, and Farmington were completed. Conferences were held with Mr. Don Dobson, Snowcrest Poultry Incorporated, Grand Junction, Colorado; Mr. Richard D. McMillan, Supervisor of City Market Stores, Grand Junction, Colorado; and Mr. Fritz Monson, Supervisor of Safeway Egg Division, Denver, Colorado.

Our feasibility study has revealed that entry into the supermarket distribution system for the primary marketing zone indicated as Durango, Cortez, and Farmington will require an egg production supply originating from a minimum of about 100,000 laying hens. In order to gain an entry into this market, eggs need to be processed, candled, graded, and cartoned under the supervision of a U.S.D.A. grader; and advisedly the minimum volume of a plant to support a U.S.D.A. inspection program is

1,000 cases per week. Herein lies the basic reason for the estimate that a minimum of 100,000 to 120,000 laying hens which would be required for an area egg production enterprise.

It is most likely that egg production from 10 units at approximately 10,240 birds per cage house would satisfy both the requirement for entry into the market place and the number of birds necessary to provide the minimum flow of eggs per week for processing in order to support a U.S.D.A. grading station.

The problem with development of a commercial egg enterprise of this size in the area is that it would have to be established almost instantaneously at the optimum level of about 100,000 to 120,000 layers to operate effectively. Estimated egg consumption for the primary cities of Durango, Cortez, and Farmington is approximately equal to the eggs produced from about 45,000 laying hens. This means an efficient production unit would be larger than the probable consumption needs for these cities. Egg production from a large complex of this type would require marketing of eggs in an area outside the previously defined primary marketing area. Interacting factors could bring about a price war on eggs due to a surplus of eggs and, consequently, a very difficult and rough marketing situation for the newly developing egg production enterprise.

As judged from the estimate of cost of production in the area, a Southern Ute Indian egg production enterprise would have egg production cost at a competitive level with current suppliers,

but would have a disadvantage as related to securing smaller supplies such as those needed in egg packaging. The freight on these items would cause the cost of the product distributed locally to be somewhat higher than the competition. If surplus eggs existed and a price war were to develop, the Southern Ute Indian egg enterprise would be at a disadvantage since current suppliers have transportation. Egg production cost equal to the projected cost for production would provide no advantage to locally produced eggs since quality eggs are currently available at a reasonable price.

CONCLUSIONS

The data from this study indicate that a large commercial laying hen operation of about 100,000 to 120,000 layers is economically feasible, but at the present time it does not have manageable practicability; therefore, an enterprise of this size is not recommended at this time. Because of the economic potential and the spin-off benefits that could enable the Southern Ute Indians to raise their standard of living, a poultry enterprise should be established, but at a smaller level as the following:

*Potential
Employment
40-45 people*

- (1) Use a demonstration approach toward the development of a commercial egg production enterprise.
- (2) Through the demonstration enterprise train leadership in marketing and production related tasks.
- (3) Through the demonstration enterprise establish identity and acceptability for locally produced eggs and identify the source with the Southern Ute Indians.
- (4) Specific parameters do exist relative to the success of a demonstration unit.
 - a. Four commercial-type cage poultry flocks must be developed over a period of time to maintain a uniform cash flow and product delivery to the market.
 - b. Egg handling and marketing must include all phases from cleaning, candling, grading, packaging, and delivery to the market outlets. Therefore, orderly

marketing procedures must be established.

- (5) Establishment of a demonstration unit would require financial commitments for two basic functions:
 - a. Capital to establish and maintain the demonstration production plant and egg handling operations.
 - b. Capital to support an educational production management supervision and training program directed by Colorado State University.
- (6) The capital requirements to establish demonstration production facilities and egg handling operations to be developed for two egg production units (two buildings) of approximately 10,240 layers each would be approximately \$75,000/first unit for the first year and \$65,000/second unit for the second year. Capital requirements for subsequent years would have to be evaluated periodically and in line with the development of new market outlets.
- (7) Capital requirements to support the continuing education phase are approximately \$39,000 for the first year and \$23,000 for the second year. Subsequent requirements are uncertain and must be determined in line with the rate and success of the developing enterprise.
- (8) Operating capital requirements to establish the cash flow for the enterprise would be approximately \$23,000 for the first year.

| | <u>First Year</u> | <u>Second Year</u> |
|---|-------------------|--------------------|
| <u>Two Cage Layer Houses with Equipment</u> | | |
| Buildings (1 per year) | \$ 31,500 | \$ 31,500 |
| Equipment | 9,200 | 9,200 |
| Well | 1,000 | |
| Egg Processing Equipment | 3,072 | 2,100 |
| Generator | 1,000 | 1,000 |
| Tractor & Manure Spreader | 5,900 | |
| Layers, 20,480 @ \$1.80 | <u>18,443</u> | <u>18,443</u> |
| Subtotals | \$ 70,115 | \$ 62,243 |
| <u>Operation Expense</u> | | |
| Feed prior to egg production | 6,000 | |
| Supplies, Egg Grading, Electricity, etc. | 4,700 | |
| Advertising and Promotion | 2,500 | 2,500 |
| Salaries - 8 persons @ \$53.00 per week for 20 weeks | <u>8,480</u> | _____ |
| Subtotals | \$ 21,680 | \$ 2,500 |
| <u>Educational Programs</u> | | |
| Salaries, Fulltime staff members graduate students | 22,500 | 14,000 |
| Travel and Expenses | 6,100 | 3,050 |
| Educational Media (Printing, etc.) | 2,000 | 1,000 |
| Educational Equipment | 1,100 | 600 |
| Miscellaneous Expenses | 500 | 250 |
| Overhead (20%) | <u>6,400</u> | <u>3,780</u> |
| Subtotals | \$ 38,600 | \$ 22,680 |
| GRAND TOTALS | \$ 130,395 | \$ 87,423 |

marketing procedures must be established.

- (5) Establishment of a demonstration unit would require financial commitments for two basic functions:
 - a. Capital to establish and maintain the demonstration production plant and egg handling operations.
 - b. Capital to support an educational production management supervision and training program directed by Colorado State University.
- (6) The capital requirements to establish demonstration production facilities and egg handling operations to be developed for two egg production units (two buildings) of approximately 10,240 layers each would be approximately \$75,000/first unit for the first year and \$65,000/second unit for the second year. Capital requirements for subsequent years would have to be evaluated periodically and in line with the development of new market outlets.
- (7) Capital requirements to support the continuing education phase are approximately \$39,000 for the first year and \$23,000 for the second year. Subsequent requirements are uncertain and must be determined in line with the rate and success of the developing enterprise.
- (8) Operating capital requirements to establish the cash flow for the enterprise would be approximately \$23,000 for the first year.

- (9) Poultry feed during the years of the demonstration project would not be manufactured on the farm. It would be purchased or on competitive quality control bids from the best possible sources. Currently quoted price for feed for this type of enterprise is \$80.00 per ton. This price is subject to economic and seasonal changes, but is believed to be a reasonably sound figure upon which to develop the system.
- (10) Manpower training and job opportunity for the demonstration project alone is projected at four to six Southern Ute Indian families in production and management, two families in marketing capabilities, and two student trainees.
- (11) Supervision of the development of the demonstration farm would utilize manpower from staff of the Avian Science Department, Colorado State University. In addition, leadership capabilities of Mr. Leon Hopkins, Extension Agent in Charge of the local office on the reservation of the Southern Ute Indians, would be utilized.
- (12) Marketing of the eggs from the demonstration project would occur under a Colorado egg handler's license with the Southern Ute Indians' trade mark identity, and it would not be certified as a U.S.D.A. egg grading and inspection station.
- (13) It is recommended that the site for the demonstration unit be equal to the primary site identified earlier in the research report as the site for a large commercial enterprise (Diagram 2).

OEO may be able to offer a grant.

- (14) It is recommended that funds for the development of this type of demonstration unit be shared among the Economic Development Administration, Office of Economic Opportunity, Four Corners Regional Commission, Bureau of Indian Affairs and the Southern Ute Indian Tribe. This demonstration project is specifically viewed as a community developmental effort for those currently defined as being of low income. In behalf of the continuing educational effort, the Avian Science Department, Colorado State University has the level of capability but does not have the monetary resources to make commitments to such developmental service projects as outlined above.
- A local feed Co. has offered \$0.4 per bird loan presumably if the enterprise buys its feed from that company.*
- (15) Immediate benefit from this demonstration project is an in-service training employment for six to eight families plus two students (preferably Indian students). Participants will share in the feeling of action, prestige, project accomplishment, and identification with a self-help Indian program.
- (16) Beyond the demonstration benefits would come the development of an Indian-owned commercial egg production enterprise, approximately 100,000 layers, and the establishment of a U.S.D.A. egg grading station. Full employment opportunity would exist for a college-trained Indian manager, three or four persons in feed and manure handling services, ten or twelve families in production, and approximately twelve to fifteen Indian persons in processing and marketing functions. Other possible benefits would be processing of spent fowl,

need for two or three persons to haul grains, and three or four families to grow started pullets for the enterprise. Likewise, since wheat can be grown satisfactorily in the Ignacio area, several families could be involved in growing wheat for feeds.

It is obvious that a demonstration project such as that which has been explained in this report could be far more beneficial to the Southern Ute Indians than furnishing employment to six to eight families. It could aid in raising the standard of living of many low-income Indian families, as well as contribute to the economic growth of the Four Corners area.

ACKNOWLEDGEMENTS

The investigators of this study would like to acknowledge with thanks to the following persons for their help in obtaining data in this study.

1. Mr. Leon Hopkins
Agent-in-Charge
Southern Ute Tribe
Ignacio, Colorado
2. Mr. Evan Stevens
Economic Development Specialist
Southern Ute Tribe
Ignacio, Colorado
3. Mr. Ralph Hansen
Extension Agricultural
Engineer
Colorado State University
4. Mr. Ivan Lorenz
Extension Agent
LaPlata County
Durango, Colorado
5. Mr. Carl Larson
Four Corners
Regional Commissioner
Farmington, New Mexico
6. Mr. Don Jeannoutot
Dekalb Chicks
Brighton, Colorado
7. Dr. R. E. Moreng
and Staff Members
Avian Science Department
Colorado State University
8. Mr. Glenn Wilson
Extension Development Specialist
Cortez, Colorado

