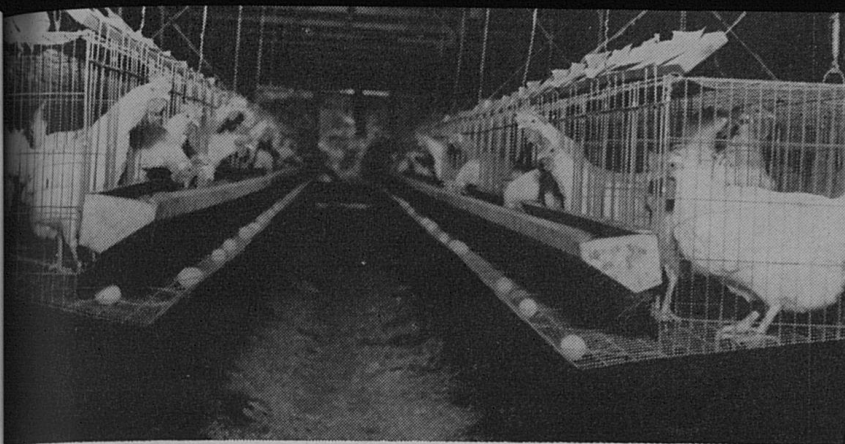


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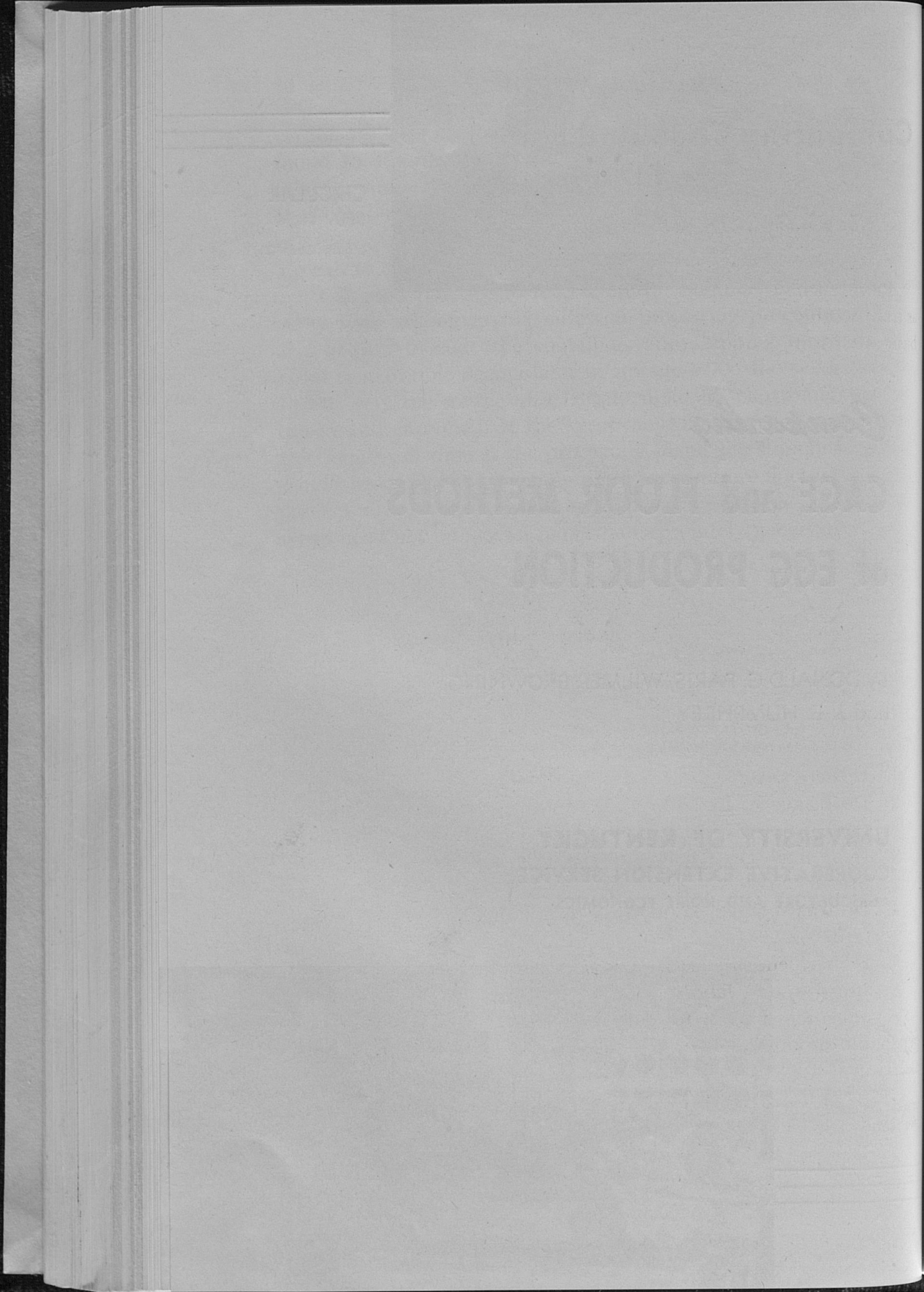
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Comparing
CAGE and FLOOR METHODS
of EGG PRODUCTION

By DONALD G. PARIS, WILMER BROWNING,
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UNIVERSITY OF KENTUCKY
COOPERATIVE EXTENSION SERVICE
AGRICULTURE AND HOME ECONOMICS

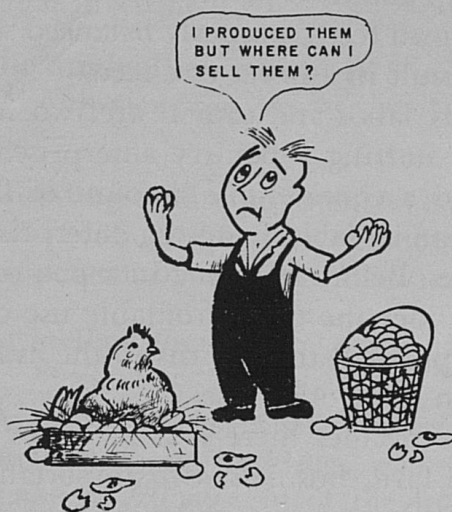




Comparing Cage and Floor Methods of Egg Production

By Donald G. Paris, Wilmer Browning, and James E. Humphrey¹

People who wish to enter the commercial egg-laying enterprise, as in any other enterprise, should consider the facts carefully. Some basic questions to ask themselves are these:



Marketing is an essential part of successful management in any enterprise.

1. Is there a convenient and continuous market for eggs?
2. Do I have an understanding of poultry management practices, or am I willing to learn?
3. Do I have enough capital to sustain periods of low egg prices?
4. Do I have home-grown grain to feed or can I afford to buy feed?
5. Is there enough family labor to handle the flock, or can I afford to hire labor?

A convenient market for eggs is important because eggs are a perishable product and must be used within a reasonable length

¹ Assistant Economist in Agricultural Economics, Farm Management Extension Specialist in Agricultural Economics, and Extension Specialist in Poultry Husbandry, respectively.

of time to preserve quality. A market that is highly seasonal is undesirable unless production can be adjusted satisfactorily. Commercial egg-laying flocks are not concentrated in areas in Kentucky. This creates problems in marketing and in some instances results in higher feed costs.

A producer, with an understanding of management practices, will control diseases, feed for a high level of production, cull effectively, and raise or buy good quality replacements.

Low-cost feed is important for profitable egg production because feed makes up about 65 percent of the total cost of producing eggs. Home-grown feeds, properly balanced with protein supplement, usually result in a lower cost feed.

Available family labor and capital are two important factors to consider before starting a poultry enterprise. A farmer with limited capital and a considerable amount of family labor can utilize more farm family labor in an egg enterprise than any other livestock enterprise. Before investing in a poultry enterprise, the farmer should consider the most profitable use of this labor and capital. For example, will the returns to the available labor and capital be larger in some other use?

When a farmer decides there is a place for commercial egg production in the farm business, two important questions generally arise: "Should I produce eggs by the cage method or by the floor method, and what size flock should I maintain?" The following questions point out factors that may help in deciding which method you will want to use.

INVESTMENTS, COSTS, AND RETURNS²

"What size flock can be started for the same capital investment in either method of egg production?"

Approximately \$7,000 investment in buildings, equipment and birds will start 1,000 layers in the cage method or 1,550 layers in the floor method of egg production. About \$3,700 investment in buildings, equipment and birds will start 500 layers in the cage method or 750 layers in the floor method

² Donald G. Paris and George B. Byers, *Economic Comparison of the Cage and Floor Methods of Egg Production*, Bulletin 652 (Lexington, Kentucky Agricultural Experiment Station, 1958).

of egg production. Building costs may vary by area of the state, causing the initial investment to vary.

“What part of the original investment is in buildings and equipment for the cage method of egg production?”

Buildings comprise about 45 percent of the original investment in a cage operation, and cages make up about 20 percent of the investment. Birds make up approximately the remaining 35 percent of the total investment.

“What part of the original investment is in buildings and equipment for the floor method?”

Buildings and equipment make up about 50 percent of the original investment, and the remaining 50 percent of the investment is in birds.

“Why is the floor method the most flexible?”

A greater part of the investment in the cage method is in buildings and equipment. Cages make up 20 percent of the investment and have little use in other enterprises.

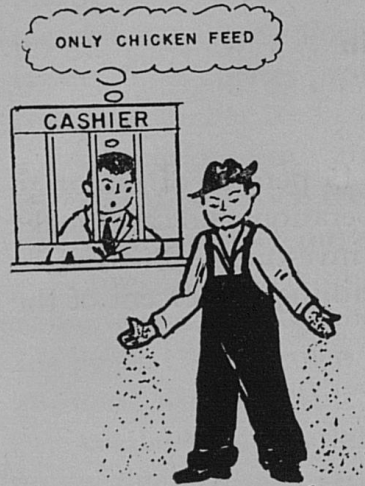
“What are the probable net returns to labor and management by the cage method of egg production?”



Good management pays higher returns in either method of egg production.

The rate of lay, price of eggs, and feed prices will vary the net return to labor and management. By using a 10-year average of monthly egg prices with feed at \$4.00 cwt., the net returns to labor and management from 500 layers varied from \$230 to \$1,260 as the average rate of lay varied from 50 to 70 percent respectively. Net returns from 1000 layers varied from \$520 to \$2,580 as the average rate of lay varied from 50 to 70 percent.

“What are the probable net returns to labor and management in the floor method?”



Poor management pays lower returns in either method of egg production.

Using the 10-year average of monthly egg prices and \$4.00 cwt., for feed, the net returns to management and labor from 750 layers varied from \$400 to \$1,660 as average rate of lay varied from 50 to 70 percent respectively. Returns from 1,550 layers increased from \$760 to \$3,375 as average rate of lay varied from 50 to 70 percent.

“What does it cost to produce a dozen eggs?”

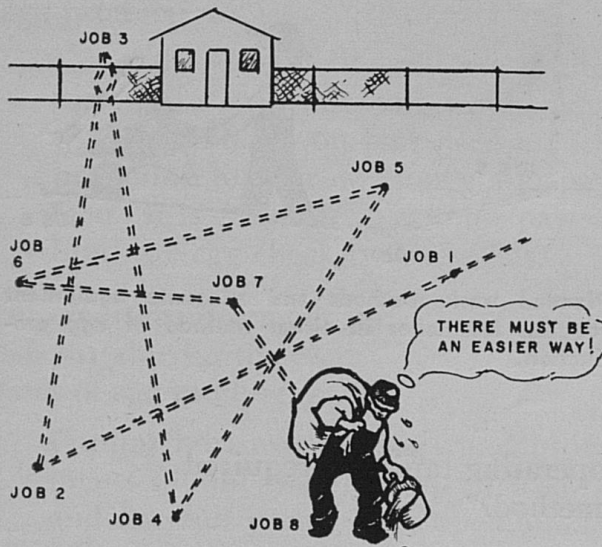
The cost per dozen eggs by the cage method, excluding labor costs, with feed at \$4.00 cwt. ranged from \$0.27 to \$0.36 as average rate of lay varied from 70 to 50 percent respectively. The cost per dozen by the floor method will be about the same at the same levels of production. When labor costs are excluded doubling the size of operation has little influence on the cost per dozen eggs. When labor costs are included, however, the cost per dozen eggs decreases as the size of operation increases in both methods.

“How much labor is required for the cage method of egg production?”

A 500-bird cage unit will require about 300 hours of labor annually for replacements and about 800 hours annually for the laying flock. The 1,000-bird operation will require about 450 hours annually for replacements and 1,200 hours annually for the laying flock.

“How much labor is required for the floor method?”

The 750-bird flock will require approximately 150 hours of labor annually for replacements and 1,100 hours annually for the laying flock. The 1,550-bird flock will require about 250 hours of labor annually for replacements and 1,600 hours annually for the laying flock.



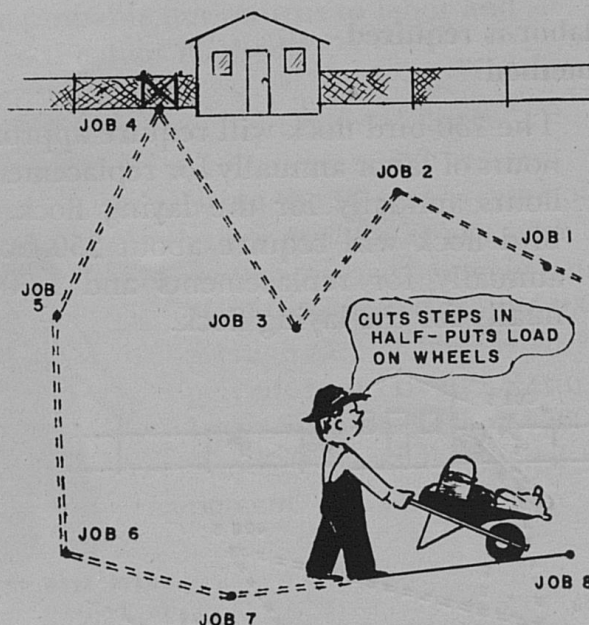
Haphazard work methods and inadequate equipment require more labor in either method of egg production.

How does flock size affect labor income per hour?”

The labor return per hour increases as flock size increases. Returns per hen remain constant and the labor per hen decreases.

“Which method has a more even distribution of labor?”

Under the present system of management, the cage method will have a more even distribution of labor. Replacements are brooded periodically and flock size remains the same. In the floor method additional labor is required for replacements during the brooding seasons.



Planned work methods and adequate equipment requires less labor in either method of egg production.

“How much operating capital is required for the floor method?”

Under the present system of management, operating capital requirements with feed at \$4.00 cwt. will average about \$630 per month for 1,550 layers. It will require about \$315 operating capital per month for 750 layers. These capital requirements include expenses for feed, allowances for flock replacements and miscellaneous expenses.

How much operating capital is required for the cage method?”

Under the present system of management, 1,000 layers will require about \$500 operating capital per month. A flock of 500 will require about \$250. These requirements include feed, replacements and miscellaneous expenses.

Which method has a more even distribution of operating capital requirements?"

The cage method has a more even distribution of capital requirements because flock size remains the same, throughout the year and replacements are brooded periodically.

"What kind of credit arrangement for feed is suitable for the cage and floor methods of egg production?"

Generally, feed will cost less if the farmer pays cash. If a cash discount would amount to more than the interest on borrowed money, it would be profitable to borrow money and pay cash for the feed. It is desirable to arrange payments to lag behind the egg check by a few days.

"What kind of credit arrangement for replacements is suitable for the cage or floor methods of egg production?"

Capital borrowed to start and grow out replacements should usually be paid back in one to one and one-half years. Cage operators have a definite advantage after the replacements system gets into operation, because replacements are added a few at a time and may be financed from the sale of eggs and cull hens. At the time replacements are usually started for the floor method, seasonal egg prices are the lowest and flock size has decreased. It is a good idea to hold out enough money during high prices and production to use for growing replacements.

"What is a suitable credit arrangement for buildings in the cage and floor method?"

The length of loan and the repayment procedure will vary with the capital position of the individual farmer. Farmers with limited capital may need to use part of the egg income for family living expenses or for operating capital in other parts of the farm business. The repayment schedule should be flexible enough to take care of extremely bad years.

“How long will it take to repay a loan of \$4,500 for buildings and equipment for the cage method?”

A 1,000-bird cage operation, with an average production of 60 percent, \$4.00 cwt. feed and 35-40 cents a dozen for eggs, will yield a net return to management and labor of about \$1,600 per year. If the farmer wants to pay \$800 of the net returns on the building it will take about 6 to 7 years to repay the loan and interest.

“How long will it take to repay a loan of \$4,000 for building and equipment for the floor method?”

A 1,550-bird flock with an average production of 55 percent, \$4.00 cwt. feed and 35-40 cents a dozen eggs will yield a net return to management and labor of about \$1,350. If the farmer wants to pay \$675 per year, it will take about 6 to 7 years to repay the loan and interest.

“What are some good sources of operating credit for financing commercial egg enterprises?”

Private individuals, the Production Credit Association, and commercial banks are good sources of credit for operating capital. In some areas feed dealers will furnish operating capital to farmers.

“What about sources of credit for investment in building and equipment?”

Farmers Home Administration, Farm Credit Administration, private individuals, and local banks are sources of credit for building laying houses.

REPLACEMENTS

“What housing is needed for cage replacements?”

Under the present system of management, the producers are replacing approximately 20 percent of the flock (200 birds in the 1,000-cage unit) every 2 or 3 months. This system requires a brooding house for the first 8 to 10 weeks and a grower house until the birds start laying. Some operators used growing cages for replacements over 12 to 14 weeks of age.

“What housing is needed for floor replacements?”

Space is usually provided for brooding all of the annual replacements at one time. It will require $\frac{3}{4}$ square feet of floor space per bird up to eight to ten weeks, and 2 square feet until they enter the laying house. If the pullets are allowed to lay for only 6 to 8 months, the laying house may be used.

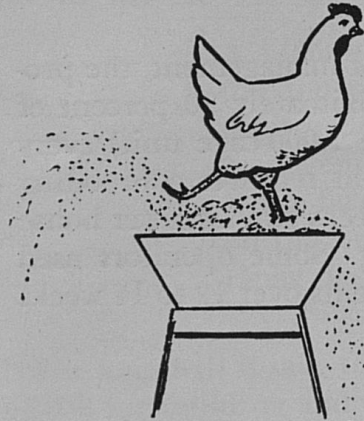
“What type of bird is used for commercial egg production?”

Generally speaking, birds of the lighter breeds are best for commercial egg production. Lighter birds require less feed and maintenance and generally lay more eggs.

“How old are pullets when they enter the laying house in either method?”

The age at which pullets enter the laying house will vary with the number of hens on hand and the rate at which they are laying. Generally speaking, home-raised pullets will enter the laying house at 20-24 weeks of age, or when they begin laying.

“How much feed will be used to raise a pullet to laying age?”



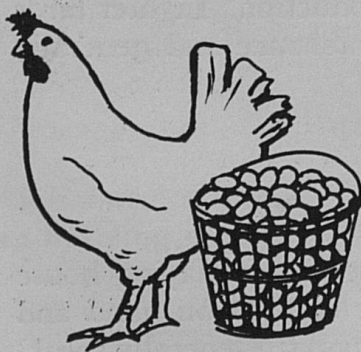
Wasted feed increases feed cost.

Replacement pullets raised in confinement will eat about 27 pounds of feed per bird up to 24 weeks. Birds will be in about 10 percent production by this time. Feed cost per pullet will be about \$1.08 to \$1.35 each, with \$4.00 and \$5.00 per cwt. feed, respectively.

Can cage replacements be raised on the range?”

Yes, some producers have ranged replacements satisfactorily in the warmer seasons of the year. An important thing to remember is to put birds on a clean range.

“What will it cost to produce replacement pullets?”



Healthy replacement pullets are necessary for profitable egg production.

The cost of a 24-week-old pullet will range from \$1.90 to \$2.15, with feed at \$4.00 and \$5.00 cwt., respectively. This includes the cost of a 60-cent day old pullet, electricity, housing, mortality, and medical costs. The cost of producing a 24-week-old pullet will be about the same for each method. Hired labor will result in a higher cash cost per pullet for the cage method than for the floor method because more hours of labor are required per pullet.

"How much labor is required for raising cage replacements?"

Under the present system of management it requires about 300 hours of labor annually to raise 500 replacements and 450 hours annually to raise 1,000 replacements.

"How much labor is required for raising floor replacements?"

It requires about 150 hours of labor annually to raise 750 replacements and 250 hours of labor annually for 1,550 replacements.

"How often are cage replacements started?"

There are several factors to consider which will affect the rate of pullet replacement: (1) rate of lay of older hens, (2) number of pullet replacements on hand, (3) age of older hens, (4) feed-egg price ratio, and (5) season of the year. Just how important each of these factors are will probably depend on individual conditions.

"What are some advantages of buying grown pullets for replacements?"

The main advantages of buying pullet replacements are: (1) pullets may be gotten as needed, avoiding over-stocking or under-stocking, (2) brooding losses are eliminated, (3) requires less total labor and (4) lower investment in buildings and equipment.

"What are some disadvantages of buying replacements?"

The main disadvantages are: (1) the farm operator cannot utilize family labor for raising replacements, (2) may be difficult to arrange satisfactory contract agreements, and (3) it offers a chance for disease to enter the flock.

CULLING

“What is the culling procedure in floor flocks?”

Birds are culled on physical characteristics. Generally the need for or frequency of culling is determined by the feed-egg price ratio. The lower the egg prices the higher the production required to be profitable.

“What is the basis of culling cage flocks?”

Records are usually kept on each hen and birds are culled on the basis of the number of eggs laid in a certain period. The closeness of culling is determined by the feed-egg price ratio. Birds can also be culled by their general appearances.

“How important is culling in either method from the standpoint of costs?”

Culling is very important in increasing the rate of lay. For example, 100 hens are laying 50 eggs per day, the feed cost per dozen eggs with \$4.00 cwt., feed is about 22c per dozen. If these birds are culled so they are laying at a rate of 65 eggs per day per 100 hens, the feed cost per dozen is reduced to 18c.

“What months are cull hens usually lower in price?”

Hen prices are lowest in the fall and early winter months. Prices are usually highest in the spring months.

EGG GATHERING AND MARKETING

“How much nest space is required for floor birds?”

The most common types of nest space in use are the rollaway nests and the community nests. One ten-hole rollaway nest will usually accommodate 100 layers. A home-made community nest can be built to accommodate from 25 to 50 layers.

“Is mechanical egg gathering possible in the cage and floor methods of egg production?”

Some commercial concerns have developed an endless belt for gathering cage eggs and eggs from rollaway types of nests. For such an innovation to be profitable, the value of labor saved and the increase in egg quality must be greater than the added costs.

“Will there be any difference in the interior quality of eggs produced by either method of production?”

As a rule, eggs produced by the cage method will be of better quality than the average farm-run-egg. There is no significant difference in the quality of eggs produced by either method if they are properly managed.

“Will eggs produced by the cage method be cleaner than eggs produced by the floor method?”

Eggs from a well-ventilated cage house will be cleaner than from a floor house. A poorly ventilated cage house may have more dirty eggs due to dust collections on the egg trays.

“Will eggs produced by the cage method have more blood spots than eggs produced by the floor method?”

The cages themselves do not cause blood spots. Blood spots are more often due to breeding.

“Will caged birds produce more cracked eggs than floor birds?”

The number of cracked eggs depends on breeding, weather and feeding. There is probably no difference in the number of cracks produced from either method. More cracked eggs can be saved by the cage method.

“Will it be easier to sell small eggs from the cage method?”

Small eggs are not as much a problem in caged birds because they are produced all through the year. Smaller eggs are easier to move this way than when they all come at one time, such as in the floor method.

“What months are egg prices usually the highest?”

Egg prices are usually highest in the fall and early winter months.

HOUSING

“What is the usual size cage house?”

Most cage houses are 24 feet in width and 40 feet in length for each 250 birds, or 24' x 160' for 1,008 cages, or 24' x 80' for 504 cages. This allows about 3.8 square feet of floor space per cage.

“What is the usual construction of cage houses?”

Siding—Wood siding is usually used in Kentucky. Some houses are constructed with metal.

Roof—The expensive feature of the cage house is truss-supported roof. A truss roof eliminates the need for poles, which obstruct the hanging of cages.

Cages—The cages are suspended on wires from the truss-supported roof. They are usually hung in three double rows. A double row consists of single cages back to back.

Ventilation—Ventilation is taken care of by continuous rows of windows near the top and bottom of the sides. Exhaust fans may also be used.

“What is the usual size house for floor birds?”

The usual house for the floor bird is 30 to 40 feet in width and long enough to provide 3 square feet of floor space per bird.

“What is the usual construction of floor flock houses?”

Siding—Wood is usually used for floor flock houses. Metal siding can be used. **Roof**—The floor bird house is usually a gable roof pole-type structure.

Ventilation—Ventilation usually is accomplished by windows located along the walls. Exhaust fans may be used.

Can barns, cribs, or other buildings be used for cage or floor birds?”

Yes, old barns or other buildings make adequate housing for cage or floor birds. Such buildings should be in good repair, have adequate ventilation, and be free of rodents. Frequently, building costs can be reduced considerably by using other buildings that have no other uses.

FEEDING AND WATERING

“How much feeder space should be allowed per 100 birds?”

Light breed layers should have about 40 linear feet of feeder space per 100 birds. Certain types of automatic feeders will require less space per bird.

“How much watering space should be allowed per 100 birds?”

About 6 feet of watering space is needed per 100 birds with automatic waterers.

“Can mechanical feeders be used in cages?”

Yes, mechanical feeders can be used with cages. Mechanical feeders will be profitable if the amount of labor saved is valued at more than the added cost.

“Is it possible to feed grain and mash to caged birds?”

Yes, some producers have fed a mixture of grain and mash. The important thing to remember is to get the proper balance of proteins, vitamins and minerals.

“Can a farmer mix his own rations for cage or floor birds?”

Commercial protein concentrates are now available to farmers. These concentrates, along with commercial vitamins and antibiotics, make it possible for the enterprising farmer to use his home grown grains and make a low cost feed.

“What is meant by peck order?”

Hen flocks seem to form a society where each hen is on a different rung of the social ladder. Each hen rules all the hens on the ladder below her. Hens on the higher part of the ladder get feed and water first. This can be controlled in cages.

PARASITES AND DISEASES

“To what types of parasites are caged birds most susceptible?”

Caged birds are susceptible to lice, mites, coccidiosis, and tape worms.

“To what types of parasites are floor birds susceptible?”

In addition to round worms, floor birds are susceptible to the same parasites as caged birds.

“To what types of diseases are caged birds most susceptible?”

Cage birds are susceptible to such diseases as new-castle, pullorum, bronchitis, fowl pox, chronic respiratory diseases, and leukosis or range paralysis.

To what type of diseases are floor birds most susceptible?"

Floor birds are susceptible to the same diseases as caged birds, in addition to blackhead, cholera, and limberneck.

"Is the mortality rate lower among caged birds?"

Yes, the mortality rate is lower under good management because birds can be culled when their production drops off before advance symptoms of disease show. Without culling there probably would be no difference in the mortality rate. The cage producer decreases the mortality cost.

Lexington, Ky.

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