

# Quality Egg Production and Marketing

C. E. ROHDE



The production and marketing of quality eggs offers greater opportunity for poultry raisers to increase net income than any other single effort in the management of farm poultry. The premiums available for quality eggs are consistently as large or larger than the difference between feed costs of production and the normal sale prices for current receipt eggs. Premiums average from five to six cents per dozen on an annual basis. If one-half of Missouri's eggs were handled and marketed so as to preserve their original quality and sold on the basis of this quality, the increased annual income to poultry raisers would exceed two and one-fourth million dollars. This improved quality product would also stimulate consumption and provide poultry raisers with an increased share of the consumer's food dollar. Increased consumption, because of the excellent food values in

eggs, would contribute materially to higher levels of nutrition and health.

The essential steps in quality egg production and marketing are:

1. Frequent gathering and prompt and rapid removal of body heat.
2. Cooling and storage in a humid place with preferable temperatures of between 50 and 55°F.
3. The feeding of a good, complete ration.
4. Production of strictly clean eggs.
5. Preferable production of infertile eggs.
6. Careful packing and handling on the farm and in transit to market.
7. Marketing at least twice each week.
8. Breeding for large egg size.

The single most important factor in maintaining the good qualities present in most eggs when the hens deposit them in nests is that of removing the body heat in the shortest possible length of time. Of almost equal importance is the necessity for accomplishing this cooling without appreciable air cell enlargement, due to evaporation. Evaporation may accompany cooling and proceed to the point of reducing grade. These two essential steps may be accomplished by gathering the eggs *in wire egg baskets*, at least three times each day. Immediately after gathering the eggs should be placed in a cool place where provisions have been made to supply a high moisture content in the air. The eggs should be allowed to cool overnight and should be cased the following morning.

Two-thirds of the eggs are normally laid by noon each day. Consequently, gathering may be done at the approximate hours of 9 and 12 A. M. and again at 4 P. M. During unusually hot weather more frequent gathering is desirable.

Eggs do accumulate in certain nests, even though an adequate number is provided. Hens have a body temperature of 106°F. This exposure of eggs to the high body temperatures of successive hens for hours on end, plus little opportunity for cooling at the temperatures that usually prevail from early spring to late fall definitely reduces interior quality both quickly and materially. Exposure of eggs to heat destroys a large part of the thick jelly-like egg white, increases the percentage of thin white, and limits the eggs' usefulness to consumers. This type of exposure also causes the yolk to lose much of the firm, upstanding appearance which is typical of a properly handled, fresh egg. Much of this deterioration can be prevented by frequent gathering, while on the other hand eggs left *in the nest all day are at least three days old when gathered*, based upon standards for interior quality.

### Cooling Facilities

Inexpensive cooling facilities may be prepared on any farm with a small amount of effort.

An outdoor cellar provides most satisfactory cooling and storage facilities. However, almost without exception, it is necessary to make provisions for additional moisture in the air. This is true despite the common belief that such cellars are quite moist and should prove adequately so without consideration to this important detail. Additional air moisture can be provided by a box containing moist sand. A frame of 1" x 6" or 1" x 8" material, 4 feet wide and 6 feet long may be placed in the coolest corner of the cellar. Sand to a depth of 3 or 4 inches is then placed in the frame and a slatted or false floor set upon the sand, which should be kept moist by the addition of approximately 10 to 12 quarts of water each day. The sand should be prevented from packing by raking at frequent intervals, or every five or six days. The use of moist sand not only increases the humidity, but aids in lowering the temperature, because evaporation is a cooling process.

The eggs should be placed over (but not on) this moist sand immediately after gathering and permitted to cool thoroughly overnight. They should be placed in the case the following morning. The case that is being used for this purpose should be kept over the moist sand, as well as the case, flats, and fillers that are to be used next in the marketing process. This is essential to insure enough moisture absorption by this fibrous material to avoid the drying out of the eggs that otherwise occurs when extremely dry cases and flats and fillers are used.

As each day's production is placed in the case a cup flat should be placed on top of the partially filled layer, to more nearly seal each cooled egg in an individual container.

Other types of farm egg cooling devices provide comparably good cooling or storage facilities. Basements under dwellings provide adequate facilities with minor changes. The sandbox described in the preceding paragraphs will not provide satisfactory moisture conditions in a room much larger than 12 x 12 feet in size. In large basements or cellars it is necessary to build a frame above the sandbox. Cardboard shipping cartons or similar material may be used to enclose this smaller area, and a burlap curtain may be used as a door. The handling of eggs with this equipment is identical with that previously discussed.

On farms where neither cellars or basements are available other types of storage facilities may be provided inexpensively.



Fig. 1.—Inexpensive hole-in-the-ground egg cooler.

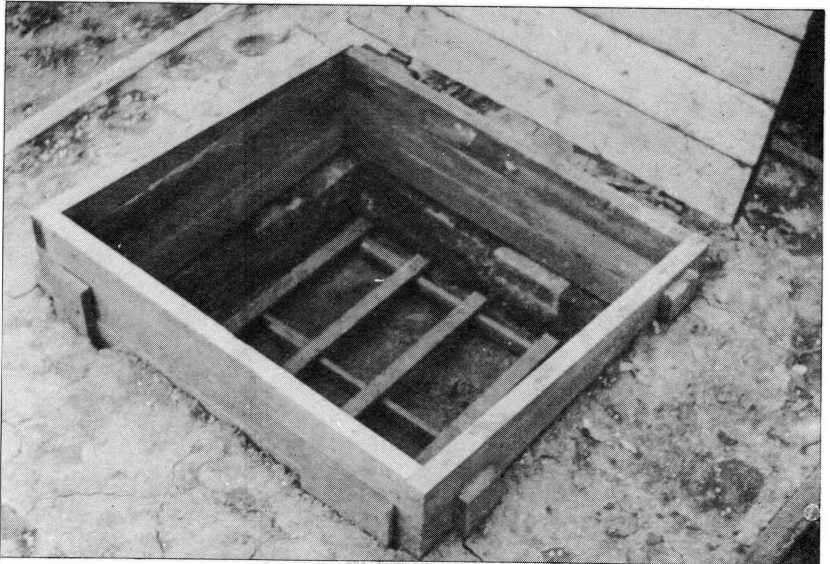


Fig. 2.—Sand is placed in the bottom of the cooler, and a slatted floor provided to avoid direct contact of eggs and the moist sand.

A hole may be dug in the ground in some shaded, well-drained area. The hole may be framed on the sides with rough lumber and an insulated hinged top provided. The top may consist of two thicknesses of tongue and groove lumber with heavy building paper laid between. It may also be built with 2" x 4" framing and the area provided by this material packed with sawdust.

A ventilator, consisting of two pipes, 2 inches in diameter, should be inserted through the top and extend upward to a height of approximately 18 inches. Sand and the slatted floor are placed in the cooler to provide moisture. See Figures 1, 2, and 3.

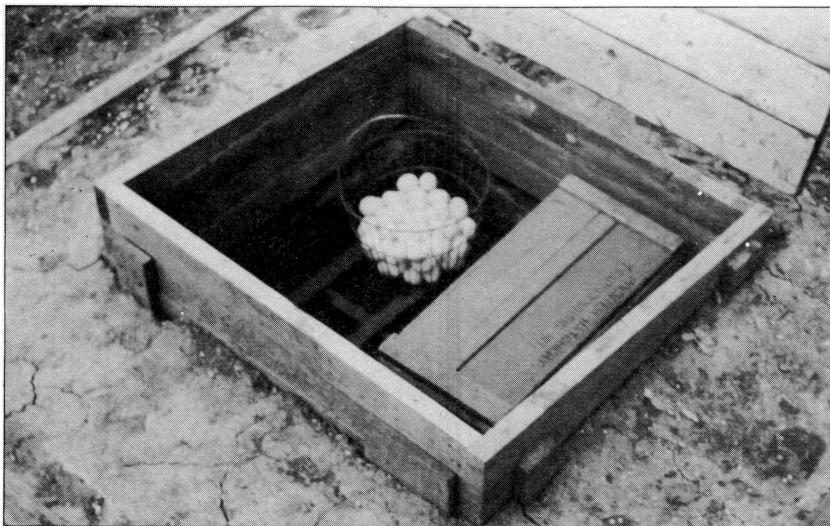


Fig. 3.—Eggs in wire basket are cooled and cased eggs stored in this cooler until sold.

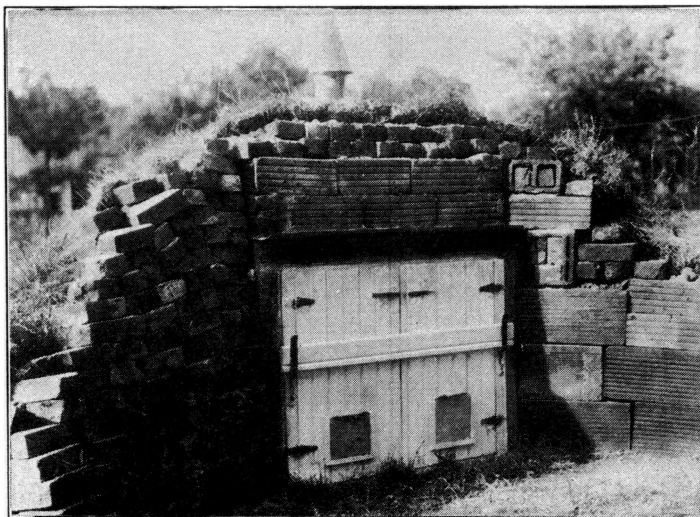


Fig. 4.—Missouri egg cooler, built of concrete slabs and covered with earth, provides a cool, humid place for egg storage.

At slightly greater expense the Missouri egg cooler (Fig. 4), may be constructed. The cost of this cooler may be lowered by using two 50 gallon oil drums as the supporting structure. See Figs. 5 and 6. These barrels are covered with at least 18 inches of soil and the cooler equipped with an insulated door.

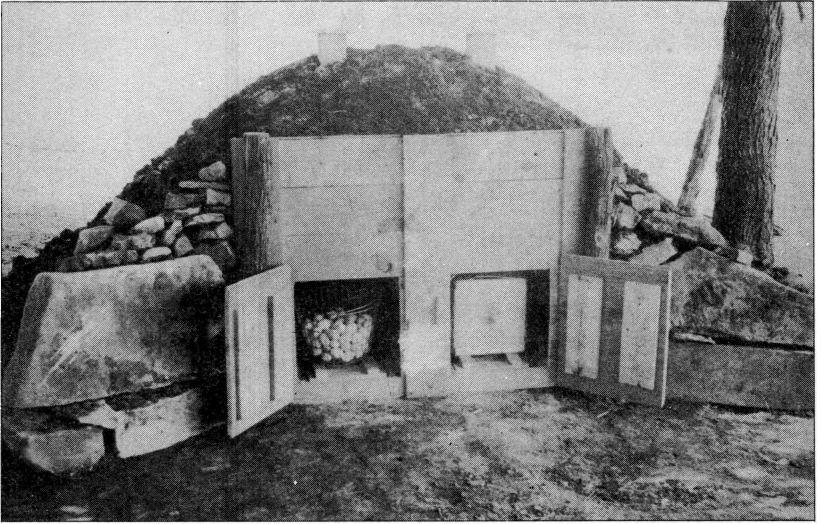


Fig. 5.—Oil drums in place as supporting structure for egg cooler. One drum is used for eggs cooling in wire basket. The other is used for eggs in cases pending sale.

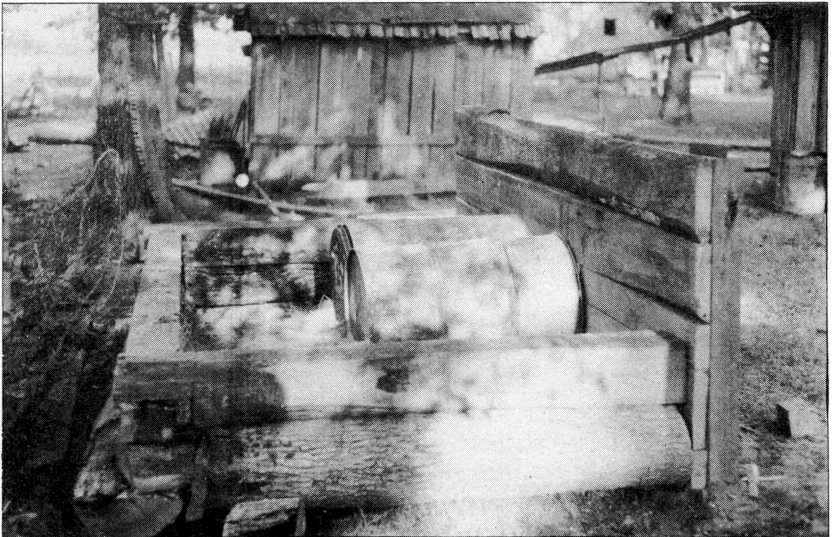


Fig. 6.—Completed cooler showing ventilation stacks from oil drums.

The increased availability of electricity makes a very cheap and most efficient egg cooling device desirable on many farms. See Fig. 7. This wind tunnel, equipped with a 10 or 12 inch fan, permits the blowing of moist air across freshly gathered eggs for one hour. Complete cooling is effected in this period of time and the eggs are then ready for immediate casing. They should, however, be held over the moist sand bed until taken to market.

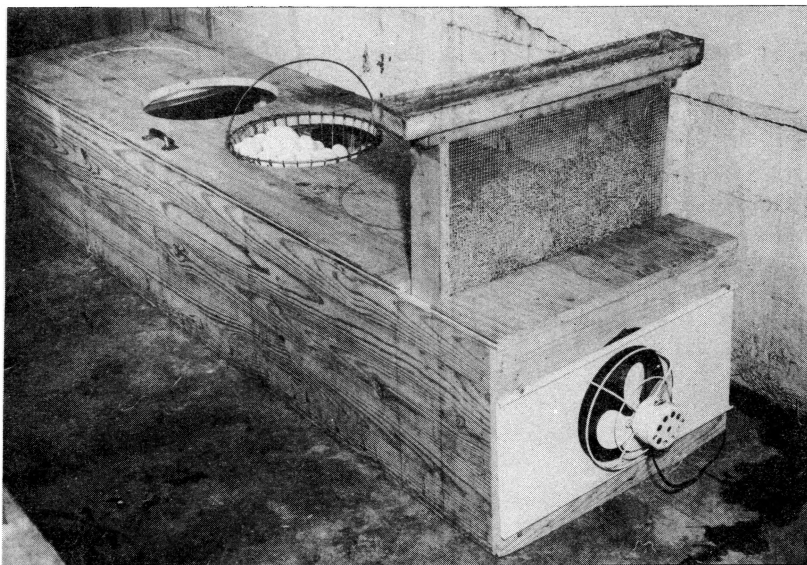


Fig. 7.—Wind tunnel egg cooler. Heat is removed from all the eggs in one hour. Moist sand is placed on the floor of this tunnel. Note moisture pan and excelsior pad filter. Excelsior should be loosely packed to the top of filter and kept moist.

The importance of prompt cooling in wire containers permitting air circulation is emphasized by Missouri College of Agriculture studies reported in Bulletin 350, which shows that eggs will lose their body heat in 4 to 5 hours if placed in wire baskets at a temperature of 50°F. It requires 10 hours in an ordinary bucket or basket, and 20 or more hours if they are cased immediately.

#### **Feed a Good Complete Ration**

The feeding of a good complete ration has long been recognized as essential to profitable egg production. This practice is likewise of primary importance since hens cannot lay eggs of good interior quality unless their feed provides the necessary quality nutrients. The term "complete ration" means a high quality laying mash, clean fresh water, oyster shell or limestone, and grain. The grain ration may consist of yellow corn

plus oats, barley, wheat, and grain sorghums, or any combination of these whole grains.

Rations of comparable nutritive value will give very similar results, as measured by interior egg quality. Variations in yolk color may be obtained with mash rations containing different amounts of yellow corn and alfalfa leaf meal. The amounts of green feed consumed, as well as the kind of green feeds, will also affect yolk color.

Some quality marketing programs have been built around uniform rations. While this may be a desirable practice, it is none the less true that there are other considerations which are of greater importance. Quality eggs, capable of commanding appreciable premiums and providing consumer satisfaction, can be produced and collectively marketed from flocks which are supplied any number of different laying mash feeds having comparable nutritive values.

**Yolk Color.**—Uniformity of yolk color, within practical limits, under Missouri farm conditions, is essential. Attempts to produce pale yellow egg yolks would be a serious mistake and involve the cultivation of a superficial kind of consumer demand. The goal of Missouri quality egg producers should be that of medium golden yellow yolk color that comes with the utilization of approximately  $\frac{1}{2}$  yellow corn in grain rations, plus the normal yellow corn composition of the laying mash fed.

*Eggs having a golden yellow color are higher in Vitamin A and higher in human nutritive values than eggs having a lighter yolk color.* However, pale or light yolked eggs may be expensively fortified with Vitamin A.

Uniformity of yolk color may be achieved on a practical basis by confinement of the laying flock until approximately 2:00 P. M. each day. This is profitable because it not only keeps the hens near the type of feed required to produce eggs but, in addition, avoids the consumption of excessive amounts of green feed and other materials that lower interior egg quality.

### **Produce Clean Eggs**

The need for offering consumers *strictly* clean eggs is obvious. Frequent gathering, before the eggs can become dirty, due to breakage and to the soiled feet of other layers, is most practical. Fewer handlings by the caretaker reduce soilage. This fact adds weight to the recommendation for the use of wire egg baskets for cooling and a saving of labor.

Soiled eggs may be cleaned. Baking soda or any of the prepared, non-abrasive, cleaning powders, preferably in cake form, may be used with a damp cloth to remove the soiled spots. When dry, enough of these materials adhere to the shell to prevent the eggs from having a "scoured" appearance. This

method of cleaning is preferable to the use of steel wool, emery cloth, etc., which leave evidence indicating that the eggs have been cleaned.

Eggs that are heavily soiled, due to breakage of other eggs, etc., may be cleaned by placing them in a small earthenware jar containing water and household lye at the rate of a teaspoon per gallon of water. The eggs may be left in this solution for approximately 15 minutes, while the remaining eggs are being cased. At the end of that time the heavy dirt and stains can be removed by rubbing gently with a cloth and the eggs permitted to dry. Such eggs do not present a washed appearance and keeping qualities are not affected. Rubber gloves should be worn. These may be covered with cheap white cotton gloves that serve as washing cloth.

Every effort should be made to produce eggs that will not require cleaning, to avoid increased labor, if for no other reason.

One nest for every 4 or 5 hens, supplied with clean nesting material, and clean deep litter on the floor of the laying house are essentials. Good nesting materials include excelsior, shavings and oat hulls.

### **Infertile Eggs Preferred**

The presence of male birds in the flock, after the breeding season, increases feed costs and constantly threatens the quality of eggs until they finally reach the consumer's table. Germ development begins at 68°F. Consequently, any failure in the marketing process that permits the eggs to reach or go above this temperature results in more rapid quality deterioration, and may definitely reduce consumer acceptance of the eggs.

In every case, where practical, the production of infertile eggs should be followed. This may be accomplished by selling all males as soon as the need for hatching eggs ends. Young cockerels should not be allowed access to the laying flock. In many instances it may be desirable to isolate superior males with a small number of hens, to avoid mortality from excessive fighting. The use of anti-pick devices on these males, which restrict their view of other birds, also aids materially in reducing losses.

While it is possible to produce and market quality eggs, even though male birds are present in the flock this is a practice, which should be avoided. Extraordinary care must be exercised to maintain quality. Prompt and efficient cooling of fertile eggs to temperatures of 50°F is absolutely necessary. In addition, a temperature constantly below 68°F is essential during the entire marketing process.

Fertile eggs may be likened to milk products—any serious departure from recommended holding temperatures, or failure

to cool eggs promptly, results in rapid deterioration similar to declines in the quality of milk under like conditions of improper cooling and high temperatures.

Fertile eggs in the process of candling and grading can only be identified by germ development. For this reason properly handled fertile eggs may be sold on a quality basis.

### **Careful Handling and Packing Important**

The air cell is normally located in the large end of the egg. Buyers observe the size and condition of this air cell as an indicator of quality. Eggs should be placed in the case with the large end up, to prevent the weight of the shell's contents from breaking this air cell. Excessive jarring or dropping of the case, or rough handling in transit to market should be avoided, for the same reason.

The use of new flats and fillers is preferred. In any event this material should be absolutely clean. Care should be taken to remove any adhering dust, because a slight increase in temperature of cooled eggs during transit may cause the eggs to "sweat". Contact with dusty flats and fillers, under such conditions, results in soiled eggs.

Any protection that can be given to eggs in the process of gathering them and in transit to market is worth while. Cases that are exposed to the sun should be covered with a tarpaulin or moist burlap feed sacks.

### **Market Twice Each Week**

Time is an important factor in egg marketing. The statement, "Eggs are Milk", implying identical handling, storing, and marketing procedure, summarizes the necessity for frequent marketing. Eggs should be marketed at least twice each week, even though less than a full 30 dozen case is sold at any one time. Producers could well afford to pay one cent per dozen to have their eggs picked up at the farm. The difference in quality and price will usually pay this added marketing cost and an additional cent per dozen.

### **The Egg Size Factor**

To many persons, egg size is one of the first considerations in quality egg production. Actually, market returns show that small eggs sell for as much per ounce as large eggs of identical interior quality. Size does affect the return per dozen, but there is little that producers can do about this factor after the current year laying flock is established.

Egg size is largely a matter of heredity. Pullets for replacement purposes should obviously be obtained from flocks that

have been bred to lay large eggs. In addition, the young stock from such flocks should be supplied a complete ration to permit proper growth and development into large mature birds.

Temperature and rations also affect egg size. Hot weather decreases egg size. Comfortable laying houses, equipped with straw lofts or other roof insulation, are very helpful. In addition, rations that contain five per cent dried milk materially aid in maintaining egg size. The profitableness of this practice is determined by cost of this ingredient and selling prices of the larger eggs.

Year-old hens lay eggs that are about 9% larger than the eggs they produced during their pullet year.

"Large" eggs are expected to weigh 2 ounces each or slightly more. Eggs that weigh at the rate of 23 ounces per dozen are usually included in the large egg classification. The "over-run" on some eggs permits the inclusion of these eggs in the large classification, and the packing of carton eggs averaging 24 ounces per dozen.

"Medium" eggs are expected to weigh an average of 21 ounces per dozen. Eggs packed in this classification range from 20 to 22 ounces per dozen.

### Federal-State Grades

The Agricultural Marketing Service of the U. S. Department of Agriculture has established uniform retail and wholesale grades for eggs. Eggs are purchased on these grades at many markets throughout the United States. In most instances the use of these grades is brought about by a cooperative agreement with the State Marketing officials in the various states. Hence, the term "Federal-State Grading Service".

Supervision of the use of these grades, as protection to both consumers and producers, is provided in the form of supervising Federal-State graders. These graders are employed by the two cooperating agencies.

The practical grades for quality egg producers, as established by the Agricultural Marketing Service, are defined on the basis of individual eggs, in the following paragraphs.

### Grade A—U. S. Extra:

*The shell* must be clean, sound, and normal.

*The air cell* must not exceed two-eighths of an inch in depth, be regular in shape, except that in retail grades it may be slightly tremulous.

*The yolk* must be fairly well centered and its outline may be moderately defined. It may be slightly mobile, but must

be practically free from other defects or blemishes.

*The white* must be firm and clear.

#### **Grade B—U. S. Standard:**

*The shell* must be clean and sound, but may be slightly abnormal.

*The air cell* must not exceed three-eighths of an inch in depth, and may show movement not in excess of one-half inch.

*The yolk* outline may be well defined. The yolk may be mobile and may show slightly visible germ development and other definite, but not serious defects.

*The white* must be reasonably firm and clear.

**Weight Requirements.**—These grades are sub-divided on the basis of weight per dozen into classifications of large and medium.

Large Extras or Standards must weigh 24 ounces per dozen and individual eggs in retail grades are permitted with a weight per dozen of 23 ounces. However, the cartoned dozen of eggs must total 24 ounces.

Medium Extras and Standards have a weight requirement of 20 to 22 ounces per dozen, with an average of 21 ounces per dozen.

On Missouri markets utilizing these grades it is customary to pay premiums above the current receipt price in these two classifications. The current receipt price in St. Louis is frequently used as the base price. Premiums above this base price range from four cents per dozen for Large Extras, during the spring months, to as much as eight cents or more during the late summer and early fall months. As the season of hot weather develops the premiums advance and the average premium for the year is approximately six cents per dozen.

Medium Extras and Large Standards usually sell at the same price, which averages about two cents less than that paid for Large Extras.

Eggs falling below these two top grades sell at prices ranging from 1 cent above to 1 or 1½ cents under the base price.

Any producer who feeds his flock a good ration, gathers eggs at least three times daily, cools them promptly in a humid place, and markets clean eggs twice each week can produce eggs that will grade 85% or more in the Extras or Grade A classification.

University Libraries  
University of Missouri

Digitization Information Page

Local identifier EC428-1941

Source information

Format Book  
Content type Text with images  
Source ID  
Notes

Capture information

Date captured 2/8/2024  
Scanner manufacturer Fujitsu  
Scanner model fi-7460  
Scanning system software ScandAll Pro v. 2.1.5 Premium  
Optical resolution 600 dpi  
Color settings 8 bit grayscale  
File types tiff  
Notes

Derivatives - Access copy

Compression Tiff: LZW compression  
Editing software Adobe Photoshop  
Resolution 600 dpi  
Color grayscale  
File types tiff  
Notes Images cropped, straightened, brightened.