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Egg Coolers for Better Eggs

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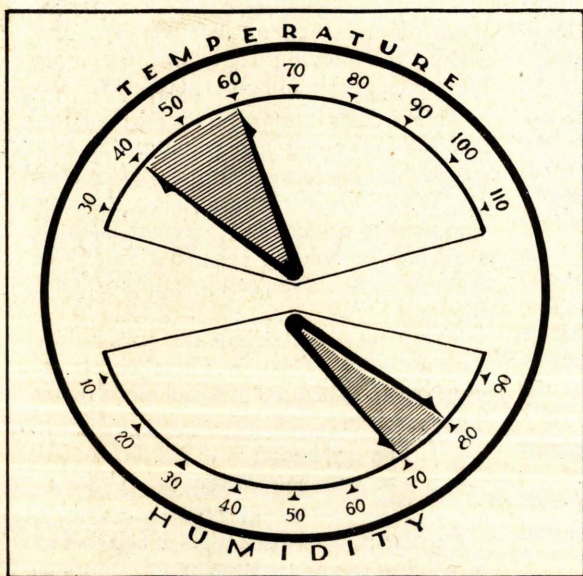
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EGG COOLERS



FOR
**BETTER
EGGS**

KEEP AT
40° to 60° TEMPERATURE
70% to 80% HUMIDITY

AGRICULTURAL EXTENSION SERVICE
GEORGE I. GILBERTSON, *DIRECTOR*

South Dakota State College - United States Department of Agriculture
ACTS OF CONGRESS MAY 8, JUNE 30, 1914

Egg Coolers

BOYD J. BONZER and LOUIS LUBINUS*

Only 40% S. D. Eggs Are Top Quality

A recent study by the Research and Marketing administration showed that South Dakota farmers are marketing only about 40 percent top quality eggs at the produce stations or first buyers.

South Dakota is an egg exporting state and has to depend on Eastern and West Coast markets to buy three of every four eggs it produces. The consumers on these export markets are demanding a high quality egg, which leads to a great deal of discrimination against the low quality mid-western eggs. Nearly all eggs are of top quality when they are laid. A very high percentage of the eggs can be held in top quality condition on the farm by proper care.

Poor gathering practices and holding conditions on the farm are responsible for the largest portion of the quality loss in the eggs going to market. An egg starts to lose its freshness as soon as it is laid. This change is more rapid the first three or four days although it continues at a slower rate for weeks or months.

An egg lowers in quality when it loses its freshness:

1. The egg develops a stale taste when carbon dioxide escapes through the shell and air enters.
2. The thick or jelly-like white breaks down and becomes watery.
3. The yolk absorbs water from the white and flattens out.
4. The air cell gets larger as the contents of the egg evaporate through the shell.

Quality loss can be held to a minimum by proper cooling and storing of the eggs on the farm. Proper cooling and storing practices are:

1. Gathering eggs at least three times a

day and more often in extreme hot and cold weather.

2. Place eggs in a cool moist place immediately after they are gathered. Eggs should be thoroughly cooled before being placed in the case.

3. Cool and hold eggs in a cool room (40 degrees to 60 degree F.) that is moist (70 to 80 percent humidity) and free from stale or musty odors.

4. Market eggs at least twice a week and more often in extreme hot weather. The poorer the holding conditions the more often the eggs should go to market.

This circular is prepared to give the farmer ideas for an egg cooler that can be constructed on his farm to fit his poultry project. We realize every farm has a different size poultry project and different facilities available for holding eggs so a variety of types of coolers and cooling equipment are shown.

Three ways of cooling the eggs before they are cased are shown. These cooling devices are all to be used in a cool moist room. They are:

1. The egg basket
2. The wire bottom tray
3. Wind tunnel egg cooler.

Construction of three types of egg coolers or holding rooms are shown:

1. The pit egg cooler
2. The above ground egg cooler
3. The egg cellar.

A sandbox cooler that will increase the humidity and help lower the temperature of an egg room is also shown.

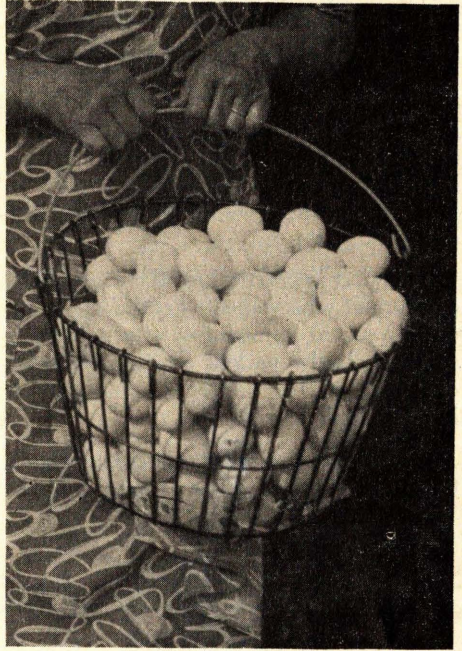
Space has not allowed us to give much detail on construction. Additional information and plans can be obtained from the South Dakota Extension Service, Brookings, S. D.

*Mr. Bonzer is assistant Extension economist in marketing and Mr. Lubinus, Extension agricultural engineer.

Cool Eggs Before Putting in Case

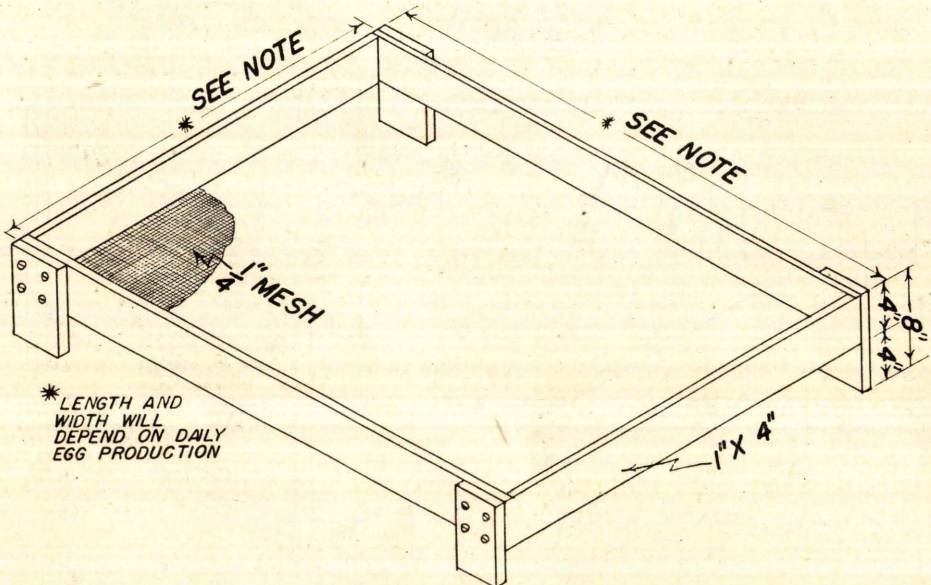
Wire gathering basket.

Eggs can be cooled in a wire gathering basket if hung in the egg room where the temperature is 40 to 60 degrees F. for a period of five to seven hours. A good practice for the average size producer is to have enough baskets for a full days production and hold the eggs in the wire baskets over night, casing them in the morning. Eggs should be placed in the egg room immediately after gathering.



Wire bottom tray

A wire bottom tray in the basement or egg cellar is a quick and efficient method of cooling eggs for the small producer. Eggs will cool thoroughly in three to four hours in a room temperature of 40 to 60 degrees F. Eggs should not be piled over three layers deep on the tray or air circulation will be reduced resulting in a longer period of time for proper cooling.



Wind Tunnel Egg Cooler

The wind tunnel egg cooler is designed for the large producer who has electricity. It can be built in 1-2-3- or 4 basket capacity. This cooler is very efficient in that it will cool a full basket of eggs in one to four hours depending on the room temperature. Like the other egg cooling aids, it should be used in a basement or egg cellar where a low temperature and high humidity can be maintained.

This unit is practical for the commercial egg farmer who wants to get the eggs thoroughly cooled immediately after gathering so they can be packed for the following days market. The picture shows the cooler in a two basket size.

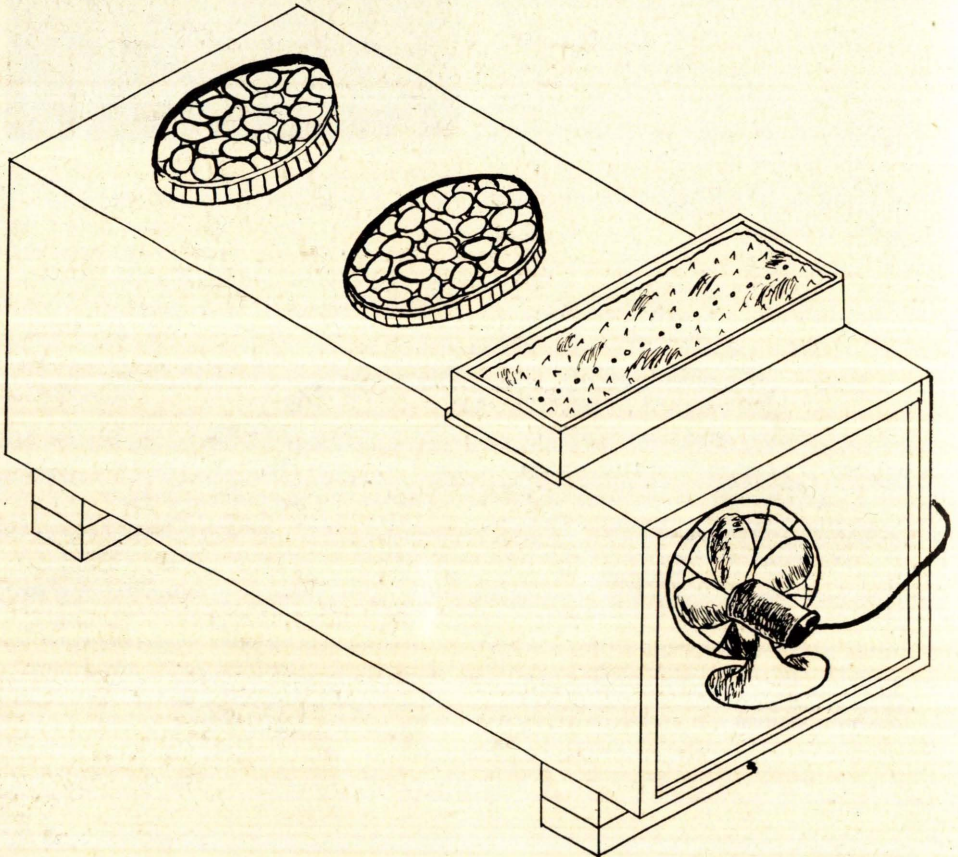
Construction of wind tunnel egg cooler:
CABINET: Holes for the baskets should be

large enough to fit snugly around the outside of the container three inches from the top. A brace is installed across the cabinet below the hole to support the container when it is in position.

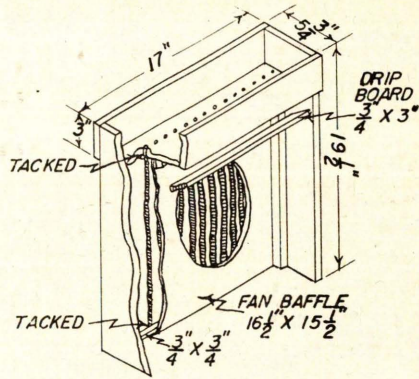
The trough and wick unit is built separately so it can be removed when the cooler is not in use. This will let the cabinet dry out and prevent warping.

A regular household fan is used. It should be large enough to move the air through the cabinet moderately fast.

TROUGH AND WICK UNIT: Cut a hole in the baffle plate the size of the fan blades and use enough lamp wicks spaced one inch apart to cover the hole. Drill one-quarter inch holes in the bottom of the trough to correspond with the number of



wicks used. The wicks should be hung on the opposite side of the baffel plate from the fan. Tack the folded end of each wick over a hole in the trough and fasten to the bottom baffel support below the fan opening. The speed of evaporation will vary with the size of fan, room temperature and humidity. The holes in the trough can be stuffed with small bits of rag so that only enough water is allowed to escape to keep the wick moist all the way to the bottom. More detailed plans for the wind tunnel egg cooler can be obtained from the Extension Service, South Dakota State College.



The Sand Box Egg Cooler

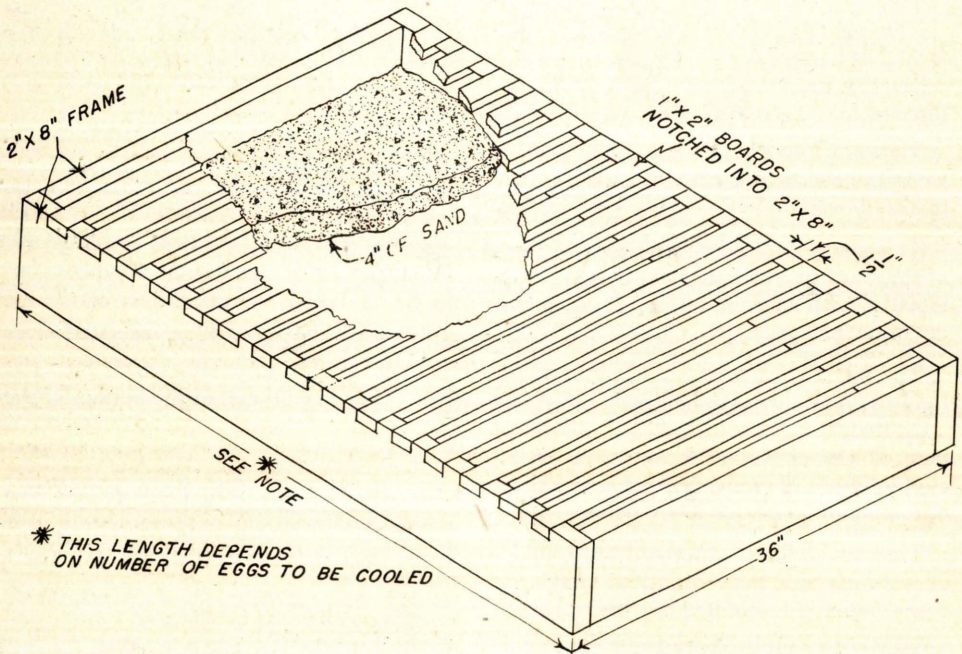
The sand box egg cooler is used to help maintain a high humidity and low temperature in a basement or egg cellar. It should be located in an out-of-the-way place that is easy to get to with the egg cases and baskets.

The sand box is built long enough to accommodate the egg baskets for over night cooling and both full and empty cases for holding.

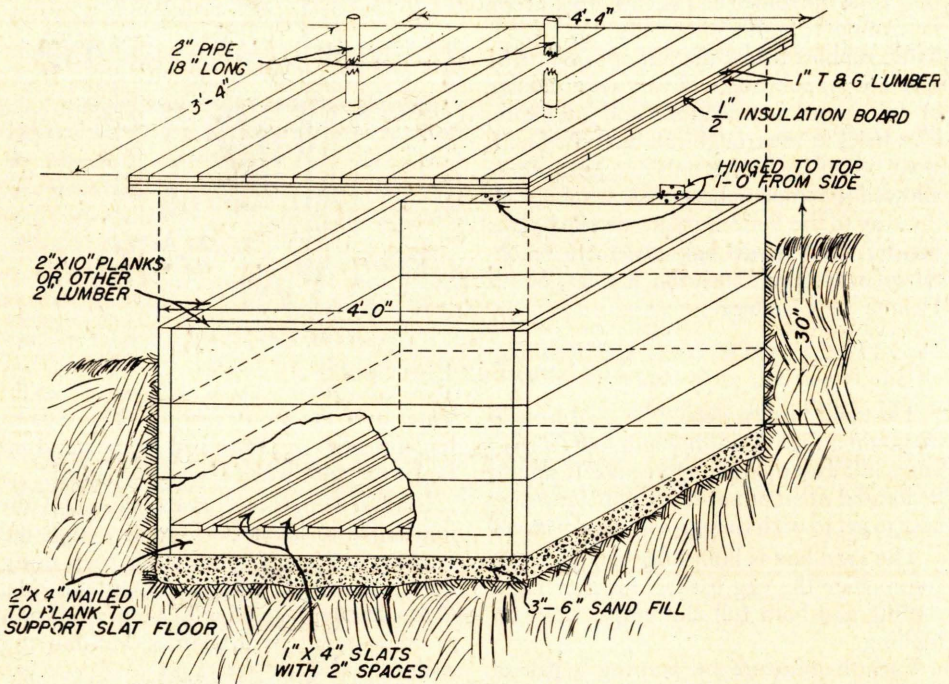
Furnish moisture by pouring a pail of

water over the sand each day. The slats or top of the box are loose and can be removed to stir the sand when it becomes caked.

If a basement is exceptionally dry and it is impossible to keep the humidity high the sandbox can be built into one corner, using the two basement walls as a back and side. One side can be closed with a burlap curtain to allow some circulation of air into the cooler.



Pit Egg Cooler



The pit egg cooler is designed for the farm that has neither a basement nor an egg cellar. It is practical for the farm producing three or four cases of eggs per week.

The cooler should be located in a shaded, well-drained area easily accessible to the poultry house.

This cooler will accommodate two cases of eggs and two baskets. One basket can be replaced with a step to make getting in and out of the pit easier.

The pit is lined on the sides with rough lumber preferably two-inch material. It has a slat floor three or four inches above a sand base. The cover is made from two thicknesses of tongue and groove lumber with a sheet or roofing or insulation board between.

The cover is fitted with two 18-inch stacks of two-inch pipe for ventilation. Hinge the cover on one side and it will be easy to open.

This cooler probably will not need addi-

tional moisture. Water can be added to the sand base under the floor if it is necessary to increase the humidity.

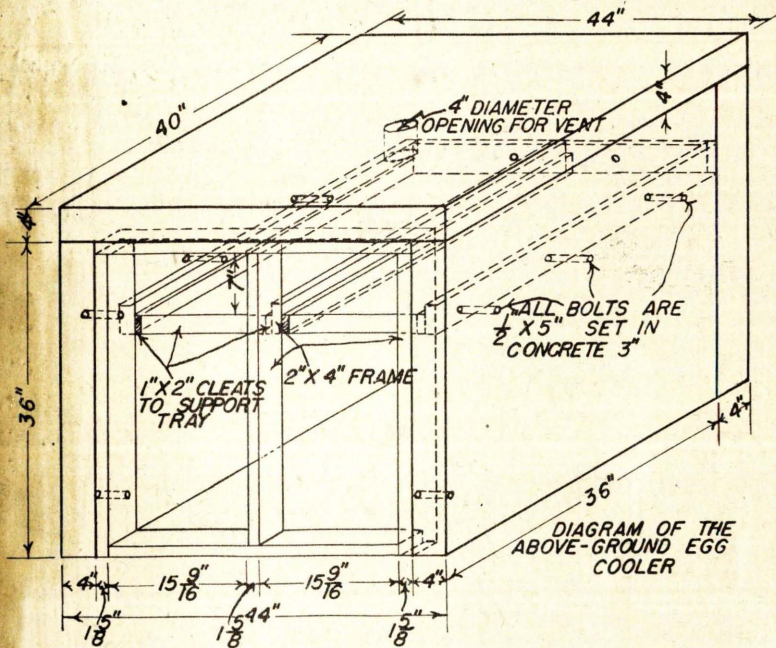
Only about six inches of the side of the cooler should extend above the ground.

Another type of pit egg cooler can easily be constructed from a single length of 24-inch sewer tile. Sink the tile so only about six inches of the large end is above the ground. Fit the top with an insulated cover and stacks for ventilation. Construct a slat floor that will fit down in the bottom of the tile.

This cooler will accommodate one wire basket of eggs. It can be made to cool two baskets by installing a second removable floor that will fit above the lower egg basket when in place.

Eggs can be held in this cooler and cased just before they are sent to market.

Above Ground Egg Cooler



The above ground egg cooler is designed for the farm producing three to four cases of eggs per week that does not have an adequate basement or egg cellar. This cooler is well adapted to the farm site that lacks good drainage or has a hillside conveniently located that can be burrowed into. It should be constructed on the north side of a building or in a well shaded area and should face north so the doors are not exposed to the sun.

Pour a concrete foundation four inches wide and six to eight inches deep. Fill the foundation within three inches of the top with sand.

The concrete sides and top can be poured in slabs four inches thick on a flat surface and put in place after they have hardened. All bolts should be properly placed when the slabs are poured.

Reinforce the top with four one-half inch steel rods. Two should run in each direction and be in the lower one-third part of the

slab. Note the hole for the ventilator in the center of the slab.

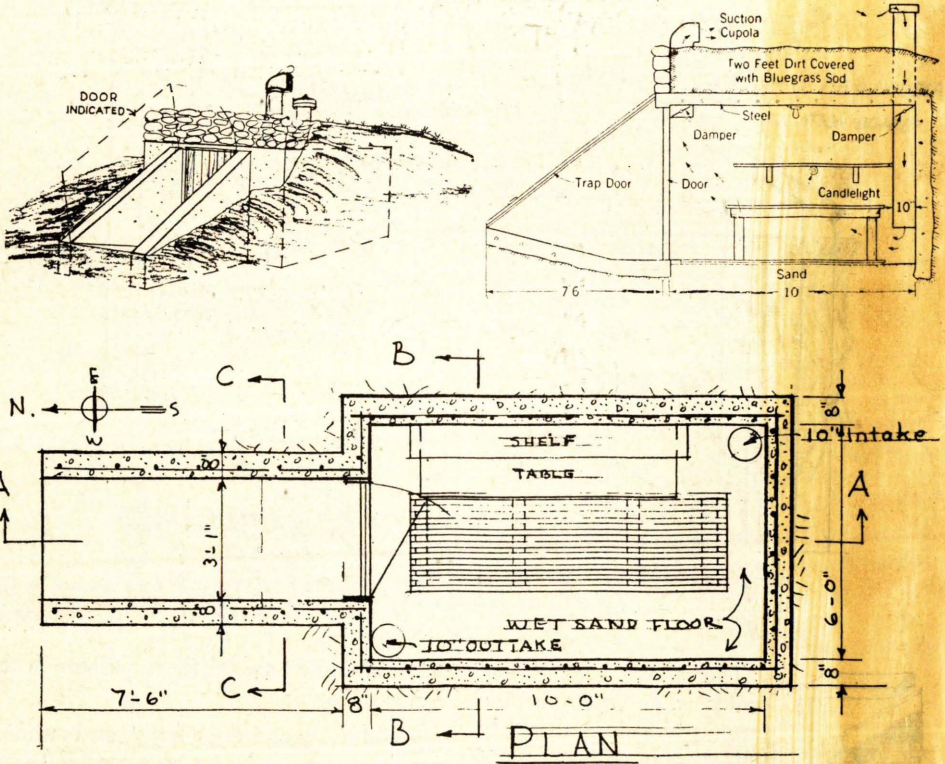
Build the wood door frame and support for the egg trays being very careful to get the holes to match the bolts in the side slabs. Now the slabs can be set up around the wood frame and held in place by the bolts and top slab put in place. All joints should be sealed with a mixture of one part cement and two parts sand.

Build wire bottom trays to fit the tray holders. Install a slat floor over the sand base to hold egg cases.

Construct doors to fit frame from two layers of tongue and groove lumber with a layer of insulation board between. Cut a four inch by four inch hole near the bottom of each door and cover with screen. Cover this opening with a tin slide that can be opened at night to provide ventilation through the cooler.

Install a four-inch vent pipe in the top of the cooler and cover over with at least 18 inches of earth. A heavy cover of bluegrass sod will increase the efficiency of this cooler.

Egg Storage Cellar



The large producer will find the egg storage cellar the most efficient place to cool and hold eggs. It is an excellent dark room in which to grade and pack his eggs anytime during the day. A good egg storage cellar can be put to other valuable uses. It makes an excellent place to store home canned goods and roots. It is a good storm cellar. It is also an ideal place to install water supply tanks and pumps for those farms with surface wells.

This cellar is cool, well ventilated and will maintain a high humidity. A damper is installed in the 10-inch shaft coming off at

ceiling level that can be opened at night and closed during the day. This will allow the stale air to escape from near the ceiling. Fresh cool air will be sucked in through the rear vent.

Saturating the sand floor three times a week should provide ample humidity. Experiments at Kansas State College report this type cellar to maintain an average temperature of 68.5 degrees during July. The winter temperature remained at 40 degrees inside with the ventilator damper open. A relative humidity of 87 percent was maintained through July.

Acknowledgement

Kansas State College Cir. 196, "Producing and Marketing Quality Eggs in Kansas;" University of Missouri, Cir. 544, "Producing and Marketing Quality Eggs,"

and Cir. 299, "The Missouri Egg Cooler;" and "Make your own Egg Cooler," published by the Rural Electrification Administration.