

## A Weekly Page of Poultry Hints to You

Here Is a Department Full of Bright Ideas for Readers of the Home and Farm Magazine Section.

**T**O test the efficiency of refrigerator cars in the shipment of dressed poultry, and to determine the changes that take place in this poultry in transit at different temperatures, the Bureau of Chemistry, United States Department of Agriculture, has made complete examinations and records of 120 carload shipments of dressed poultry which traveled an aggregate of 140,000 miles.

The hauls averaged between 1000 to 1500 miles, and terminated generally in New York City. No car was used twice, and many different types of ordinary refrigerator cars were employed.

The shipments were made in winter and summer, so that the effect of outside temperatures could be determined. Many of the cars were equipped with accurate recording devices which showed the temperature near the ice bunker and in various parts of the car, and also outside temperature.

As a result of this experiment the specialists have found that the builders of refrigerator cars have not kept pace with the refrigerating industry in general, and have also determined the temperatures which best keep poultry fresh in long trips from Iowa or Tennessee to the Atlantic Coast markets.

### Poultry Carefully Prepared.

The poultry shipped in these cars was carefully prepared and chilled for 24 hours to 32 degrees F., packed in one dozen to the box, and the boxes placed in refrigerator cars which had been iced 24 hours before loading.

Accurate chemical analyses of the conditions of the poultry were made prior to the shipment, special attention being given to the percentage of ammoniacal nitrogen in the muscle tissue, which is an accurate index of the degree of deterioration in the fresh dressed poultry. The fresh chicken shows .0110 per cent such nitrogen. It was found that poultry kept at a temperature of 18 degrees to 26 degrees F. showed only .0120, while a temperature of above 31 degrees F. gave a nitrogen per cent of .0131, and 35 degrees F. or above, a nitrogen per cent of .0141.

The poultry after arrival in the car was then kept under examination while in the wholesale commission houses, and at the retailers. The commission houses kept the low temperature shipments at 29.8 degrees F., whereas the average for the high temperature shipments was 32.2 degrees F. The retail stores kept their poultry at from 35 degrees F. to 30.3 degrees F.

It was found that the high temperature shipments after a transit period of five days showed an increase in nitrogen to 0.143 per cent. The high temperature shipments at a retailer's after seven days showed a nitrogen percentage of .0188. The changes during the commission period were, therefore, very slight, but after four days at a retailer's, or nine days after the railroad haul the low temperature shipments increased to .0144 per cent, which is nearly the same as the high temperature shipments at the end of transit period.

This indicates that if the car temperature is above 35 degrees F. the poultry when it reaches the market has the disadvantages of a deterioration equivalent to five or more days in the market, and must be consumed five days earlier than that arriving at car temperatures below 34 degrees F.

### Most Satisfactory Temperature.

The experiments indicated that less than 31 degrees F. is the most satisfactory temperature of dressed poultry for long hauls. The ten-degree rise in the temperature of the car during the haul makes a difference in keeping time on the New York market, even when the market conditions are favorable.

Even poultry excellently handled, as was the case in these experimental shipments, if exposed to unfavorable temperatures during transportation, receives an impetus towards decay that cannot be overcome by subsequent careful treatment on the market. It is a comparatively simple matter to prevent decay, but it seems to be impossible to stop decay by the use of low temperatures once the decay has gained a foothold.

Imperfect work by the carrier nullifies to a certain extent the work of the packed, and the wholesaler or re-

tailer handling the goods on the market.

The temperatures indicated by this investigation to be most desirable for the transportation of dressed poultry are considerably lower than those generally accepted as satisfactory.

### Efficiency of Cars.

The information furnished by these 120 car shipments of dressed poultry indicate that most of the refrigerated carriers of the United States are not built to maintain optimum condition during warm weather for the transportation of a highly perishable commodity, such as dressed poultry. Certain refrigerator cars are much more efficient than others, and their increased efficiency apparently results from their construction.

The insulation of the car in relation to temperature is its most vulnerable part, with the character of the ice bunker next in importance. In the past the insulation has not been sufficiently heavy to maintain the low temperatures produced by the refrigerant, and the bunker has not been so built as to distribute its refrigerating effect evenly throughout the car.

This last was fully established by the use of thermographs and the electric recording thermometers in various parts of the car. The use of a dead air space in cars is not found to be successful. Cork, the best known insulator, which is almost impervious to water and contains practically no nitrogenous material which might produce decay, has not been used to any great extent in car construction. Wool and hair felt are good insulators, but their high percentage of nitrogenous material makes them good bacterial media when moist.

These materials when once moist seldom dry out, and the result is putrefaction, giving rise to offensive odors, which contaminate goods. Some of the vegetable or cellulose fiber insulators are perhaps slightly more resistant to moisture and bacterial action, but in time they also become moist, and the alkalies is for this reason that car-builders are exerting every effort to prevent moisture from reaching the insulation. Mineral wool is least subject to decay, but on the other hand, its non-adhesive qualities hinder the manufacture of strong material.

### Insulation Is Alike.


The insulation in the side walls and floors of the cars used by six different lines shows no radical difference in quality or quantity, though methods of construction in certain cases are preferable.

The roof of the car theoretically is most severely taxed to prevent transmission of heat. The most efficient cars studied were those with the best insulated and best built roofs. More attention should be paid to roof and floor insulation, and the floor should be built with its insulation more effectively protected against moisture.

The wire-basket principle of ice bunker is sound because abundant air access to ice and salt results in increased efficiency. A serious shortcoming of the present types of cars is the impossibility of equalizing the temperature at the center and at the bunker so that all parts of the car are sufficiently cold. Good bunkers and any additional insulation, together with the stowing of the load so as to provide passages for cold air between packages, should materially help to improve results.

The well-cooled package does not show changes in temperature corresponding to those in the air of the car, but a long continued increase of temperature or direct contact between the package and the wall of the car, and therefore, the source of heat, affects the goods in the course of time. The daily rise and nightly fall of temperature in the car sometimes result in slight changes in the packages, but it is the constant or maintained rise in the average temperature of the car that is responsible for objectionable results noted at the expiration of long hauls.

In a Budapest publication it is stated that the Countess Ostenplaten, who spent more than \$200,000 a year on dress, has left her heirs sixty dresses and 110 hats—but nothing else.



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## Hen and Incubator Are Compared

**T**HE hen is an efficient mother and has certain advantages which no artificial system has been able to provide. But the incubator is better adapted to large enterprises and to small ones under certain conditions. Notwithstanding the popularity of incubators, large and small, and brooders of different sizes and styles, Prof. A. C. Smith, poultryman Minnesota Agricultural college, maintains that there is an advantage for the small poultryman in hatching with hens.

He says that hatching in the old-fashioned way involves very little expense—none whatever if the poultryman owns his own flock. A further advantage is that a small number of eggs may be set, thereby allowing incubation soon after the eggs are laid, which often means better hatches and stronger chicks. With proper arrangements and, up to a small limit, the same number of eggs set under hens, requires no more work than when the hatching is done with an incubator.

When a sitting hen abandons her nest there are fewer eggs spoiled than when an incubator goes wrong, and this is frequently a big item. But there is another good word for the brooding hen, and that is in caring for the baby chicks. She will take better care in general, of the chicks she hatches, than the average human being can take, and because of that service, less attention is required than where the chicks are reared in brooders.

The professor indulges in a little humor when he says in preparing a place for a hen to sit a man usually "selects a box of large or small dimensions, but usually not less than ten inches in height, therein a nest of hay, the eggs, then hen, and outside a little water and corn, and expects the hen to do the rest. Of course, the hen has to leave the nest, and to return she must jump first upon the edge of the box, ten or twelve inches high, and from this perch she is expected to alight in the midst of thirteen to fifteen eggs without striking one. If the hen selected that nest it would be where she would walk on and off, and the sensational high dive would be omitted from the daily program."

Mrs. Anderson Hughes Drew claims that New Zealand shows the success of woman's suffrage in that the infant mortality is smaller than in any other country in the world.



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