cream and skim-milk to be termed a separator. That portion of a separator which is to hold the milk, and is called the bowl, forms the essential part of every separator and revolves around a vertical axis and must always be a rotating body of necessity made of good material to withstand the lateral pressure to which it is subjected.

The milk when put into the separator bowl may be said to have much the same conditions and action as when it stands quietly at rest in a pan or can. Just as milk when it is poured in a steady stream into a can finds at once the lowest part of the can, which is the bottom, and spreads itself over the bottom in a horizontal layer and gradually fills the vessel from bottom to top, so does milk allowed to flow into a separator bowl when at speed find its way with lightning rapidity to the most distant part of the bowl, spreading out into a cylindrical surface until the bowl is gradually filled from the outside to the inside. Just as milk standing in a milk pan at rest exercises pressure on the bottom and sides of the pan, due to the force of gravity, so precisely milk, in a separator bowl in motion, exercises a pressure on the sides of the bowl, which is due to centrifugal force and is in proportion to the speed and diameter of the bowl. As the fat globules move upward in the pan, in a direction opposite to that in which the gravity acts, so the fat globules in a separator bowl filled with milk and in motion travel in a direction opposite to that of the centrifugal force or inward or from the outside to the inside of the bowl.

Separator bowls are so constructed that the milk flowing in is delivered into them near the circumference or at a point outside of the perpendicular layers of cream to avoid the milk passing with force through these layers and displacing them and thus interfering with perfect separation. The outflow of cream and skim-milk from a separator bowl takes place with considerable force or energy and is proportionately equal to the speed at which the bowl is driven and the distance from the axis at which it delivers in order to reduce the force as much as possible to avoid whipping the cream. The exit for the outflow of cream is placed as near the axis as can be. The outflow of cream and milk together equal the amount of milk which flows into the bowl in a given time. The proportion of the weight of cream to skim-milk is determined by the rapidity at which the milk flows into the bowl, and in all separators the thickness of cream can be regulated at will by this means when the separator is at speed. For the winter season in almost all separators there are arrangements whereby it is possible to regulate the quantity of cream with a uniform inflow of milk and to adjust the separator to skim milk successfully of different percentages of fat and maintain a normal capacity. The three main points to be observed in operating a separator are—feed, speed, and temperature of the milk.

The greater the feed of milk entering a separator, the shorter the time it can remain in the bowl exposed to the centrifugal force, and if the feeding be carried beyond a certain limit there must be more or less imperfect separation of the fat from the milk. This can be determined by the flow of cream; as has been stated the quantity entering the bowl equals the cream and skim milk from it. And the thickness of cream is regulated by the feed, consequently if the cream be too thin, it is an evidence of its not having been retained in the bowl sufficient time to complete the separation. The feed should be even and regular, as nearly as can be.

There is to every separator a safe and proper speed at which the best results are obtained. This is usually stamped on the bowl and is as high a rate as the manufacturer feels secure in recommending and this should never be exceeded to any great extent as it might result in injury to the separator or the operator, or perhaps both. It is essential, however, that the desired speed be maintained regularly and evenly while separating, remembering that any cause that might demand higher speed can be met by reducing the feed.

Temperature of the milk to be separated is important. The mode and time of tempering before it passes into the separator are all important facts in successful and exhaustive skimming. Higher temperatures increase the difference in specific gravity between the fats and other parts of the milk, provided time is allowed for expansion of the fat to take place before it passes into the separator, which is about three to five minutes. It also reduces the viscosity of milk, making it more fluid, when it will flow faster and offer less assistance to the transit of the fat through it toward the centre of the bowl, thereby increasing the capacity and effectiveness of any separator.

Large amounts of milk should not be heated to a temperature suitable for separation in any case, as the formation of lactic acid and the coagulation of the albumens go on so rapidly that the milk is in a condition to leave the residue which adheres to the sides of the bowl clogging the skim milk outlet and making it necessary to stop oftener than would have been the case if smaller amounts were heated as required by the best separator.

In my opinion, there is no such thing as no one separator contains points superior in every respect to all others; and, again, a separator for one may not be suitable for another. It is not in accordance with the eternal fitness of things and the patent laws that it should. The value of a separator is determined chiefly though not exclusively by its capacity for work. This is best measured by the quantity of milk which it can be made to cream in an economical manner at a fixed cost.

It is also very questionable whether circumstances may not exist in which, where very slight differences in their capacities exist, the less capable of two separators may not be preferable. Since it may possess certain advantages which appear to be of little importance yet have a material value in the circumstances in which they are used.

A New Fruit Car

The Winnipeg *Free Press* reports the arrival in that city of a novelty in the way of refrigerator cars from the East. This new car is intended to keep fruit in good condition while in transit. In the instance referred to the fruit in this new car was in far better condition than fruit that arrived in the same shipment in ordinary cars.

The car is provided with a slatted bottom, above the ordinary car floor. Passageways are located underneath the false bottom and extending from end to end. The passageways communicate directly with the ventilating pipes, which are provided at their upper ends with a revolvable cowl, having a vane extending from the side opposite the opening. By this means the car, in passing along, will always throw the open side to the front of the car. The rush of air caused by the onward impetus of the car passes down through the cowls, down and through the passageways, and passing up between the cases, where the heated air passes outwardly at the top, through the side-opening, or the windows. Heretofore in the ventilation of cars the air was practically unchanged, although two openings were provided, but by this invention the air continually changes and the fruit is consequently subjected to a complete change, as it would be if growing in the open fields.

Will it Pay to Grind Grain for Poultry?

The New York State Experiment Station has recently reported upon some experiments made to determine whether it will pay to grind grain for poultry. The following is a summary of the conclusions reached: The first experiments were begun with two lots of twenty-two chicks each, one lot being fed all its grain finely ground, the basis of the ration being mixed of two parts by weight of corn-meal, two parts wheat bran, and one each of wheat middlings, old process, linseed meal, and ground oats. This was supplemented by skim-milk, dried blood, and additional amounts daily of corn, meal and ground oats. The grain