Refrigerated LOCKER SERVICE For Rural Patrons

by S. T. WARRINGTON

AGRICULTURAL EXTENSION DIVISION

UNIVERSITY OF MINNESOTA

Suggestions on Locker Use

Reduce rental cost per unit of product

Slaughter only one animal at a time and plan slaughter ahead so as to have animals ready as needed during the year.

Slaughter small animals, or exchange, buy, or sell quarters or halves of carcasses.

Release extra lockers as soon as packages can be packed in the original locker.

Store ham and bacon at home during the cold months.

Pack fruits and vegetables in containers that fit the locker best.

Observe these precautions

Keep carcasses clean; insanitary handling promotes spoilage.

Chill all carcasses quickly and thoroughly after killing to draw out animal heat and thus prevent souring or spoilage at the bone.

Do not allow carcasses to freeze before they are cut. Freezing and thawing weaken cell walls which hold the juices when meat is cooked.

Have pork frozen soon after it is chilled (24 to 48 hours). Enzyme activity, which causes rancidity in pork fats, is rapid in the chill room, being much slower at locker-room temperatures.

Do not put unfrozen packages in the locker where air movement and temperatures will not permit the fast freezing which helps retain the palatability of frozen products.

Know what cuts you have in your locker, and plan your menus accordingly.

Try to keep a variety of products in the locker.

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Refrigerated Locker Service for Rural Patrons

INDIVIDUAL LOCKERS for storing foods in below-freezing temperatures have been available to the public in many sections of the country for a number of years. The modern locker plant, however, with its sharp freezer, chilling facilities, and other services is a product of the last decade. In Minnesota there were four plants operating in 1935, eight more were opened during 1936, 48 during 1937, 91 during 1938, and 28 during the first two months of 1939. The total of 179 plants operating on March 1, 1939 had an estimated capacity of more than 51,000 lockers, sufficient to serve 40,000 or one fifth of all the farm families in Minnesota.

A survey of all Minnesota locker plants was made during March, 1939 to find how extensively they were being used. Reports were made by 118 of these plants. The reports are summarized in table 1 according to the year in which the plant started operating. On the basis of the above figures it is estimated that 23,000 farm and 5,000 urban families were using lockers in Minnesota on March 1, 1939. If it is assumed that 100 lockers are needed to serve adequately the needs of 80 patrons, then the plants that were organized in 1935, 1936, and 1937 are being utilized at 94, 88, and 81 per cent capacity, respectively. The fact that the older plants have the greater proportion of lockers rented indicates to some extent that patrons continue to use the lockers over a period of years.

TYPES OF PLANTS

The service rendered in Minnesota locker plants varies from one section of the state to another, as well as between plants. Differences in demand or desires of communities, income of average group in the areas to be served, type of organization sponsoring the plant, the amount of capital available for investment, and the size of the plant are all reasons for this variation.

Based on the amount of service rendered, plants operating in Minnesota may be classified as: (1) locker room only, (2) locker, sharp-

Table 1. Locker-plant Use in Minnesota March 1, 1939 as Reported by 118 Plants

	Plant established					
	1935	1936	1937	1938	1939	All
Number of plants	3	4	30	60	21	118
Average locker capacity	431	401	325	285	236	294
Patrons per 100 lockers	75	71	65	50	32	54
Percentage town patrons	10	17	22	17	11	17

freezing, chilling, and cutting facilities, (3) same as (2) plus labor for cutting and grinding, and for slaughtering on the farm, (4) same as (3) plus facilities for slaughtering at the plant, (5) same as (3) or

FIG. 1. SHARP FREEZING HELPS MAINTAIN PALATABILITY

Baskets facilitate handling and keep patrons' meat separate. Packages should not be piled while freezing.

(4) plus curing, smoking, lard rendering, and sausage service, (6) same as (3), (4), or (5) plus delivery of frozen meat to locker rooms, in small, outlying communities.

Plants providing only locker-room service are not considered satisfactory for two reasons: First, the meat may not be properly chilled, especially during the warm months of the year; second, sharp freezing, which is considered essential to the maintenance of quality, cannot be accomplished satisfactorily when the meat is put in the locker before being frozen. There are only a few such plants in Minnesota.

Although used in some communities, the second type of plant, where the sharp-freezing and chilling facilities are available but are handled by each individual, has two weaknesses: First, overloading or inefficient use of sharp freezing and chilling capacity in the plant; second, misunderstanding among patrons because of congestion in the sharp-freeze and chill rooms. Overloading the sharp freezer cuts down the rate of freezing because piling the packages shuts off the air flow. The slow freeze may reduce the palatability of the product when cooked. Frequently the type of paper used and the wrapping done by patrons themselves are unsatisfactory. This may result in excessive loss of moisture during the storage period and hence palatability is reduced.

The third type of plant, where all cutting, grinding, and wrapping is done by the plant operator, is most prevalent in Minnesota. This type usually furnishes slaughtering service at the farm, if desired. In these plants the patron must let the plant operator wrap all meat, and in most cases the operators insist on chilling and cutting the meat. This provides some control over daily volume and over use of the sharp freezer, but the slaughtering done by farmers on any one day or during any one week cannot be controlled and hence congestion

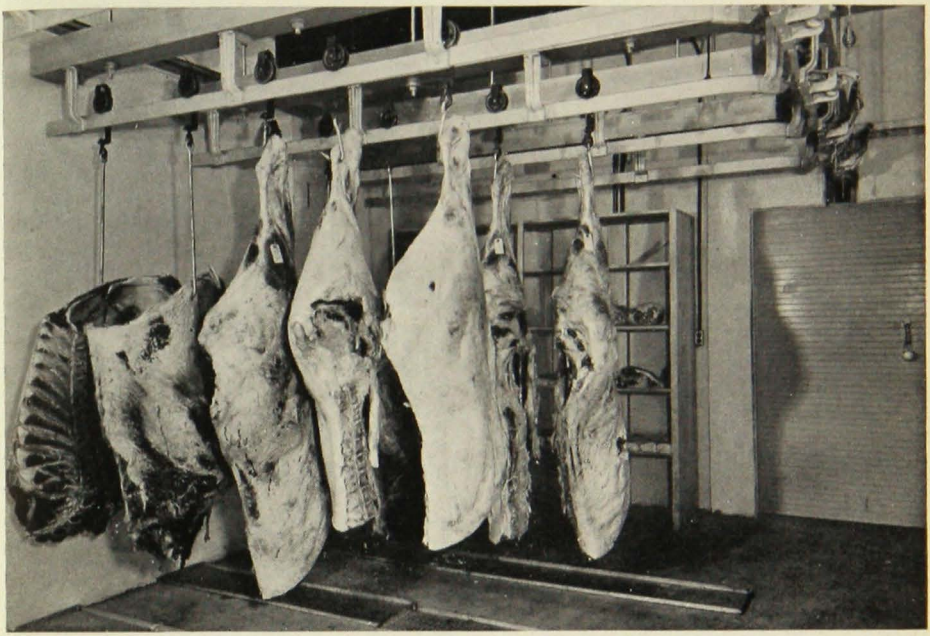

FIG. 2. QUICK CHILLING WITH CONTROLLED TEMPERATURES ESSENTIAL

There should be plenty of room for carcasses. Warm carcasses should not be hung close to cold ones. Pork should be cut within 24 to 48 hours for best results.

in the chill room may result. This in turn results in an overloaded condition in the sharp freezer. Congestion is not so likely to occur if most of the farm slaughtering is done by the plant butcher.

In the fourth type the slaughtering is done at the plant. The volume in this case can be controlled. This type has the added advantages of more efficient utilization of the butchers' time, better facilities for slaughtering, more sanitary conditions for slaughtering, and quicker chilling. This plan also eliminates the problems involved in mileage charges for going to and from the farm.

The fifth type of plant furnishes, in addition to other services, those of curing and smoking hams and bacon, lard rendering, and sausage making. Some of these plants have special refrigerated rooms for curing. Others put the brine vats in the pre-chill or chill room. Under these conditions this service may be rendered during the warm months as well as the cold. Though many farmers will continue doing these things for themselves, there is some likelihood that this service will expand.

The sixth type of plant in Minnesota involves an arrangement whereby one locker plant provides part or all of the processing services for one or more groups or individuals who have only locker rooms in connection with some other enterprise. This arrangement makes locker service feasible

for the outlying community which does not have a potential volume of business large enough to justify furnishing facilities and labor for processing.

Though some of the earlier plants furnished only limited facilities and limited service, it is evident that the trend is toward the more "complete service" type of plant.

This results from the demand on the part of some of the patrons for minor services of slaughtering, curing, smoking, sausage making, and lard rendering. This trend applies especially to the larger plants and those plants which are operated as a separate business.

LOCKER PLANT TEMPERATURES

The chilling facilities provided in most plants are considered essential to eliminate possible deterioration or spoilage from chilling in uncontrolled temperatures on the farm. Many plants now provide a pre-chill room which may be held at 32° to 34° F. to secure a fast chill. Beef is then moved to the regular chill room, where a temperature of 36° to 38° F. is maintained for aging. This eliminates some trouble from condensation of moisture on the cold carcasses from the warm or freshly slaughtered carcasses.

The sharp-freeze room, where temperatures maintained range from −10° F. in some plants to 10° F. in others, is available in most plants. The plants using the lower temperatures depend on natural air flow while those which use higher temperatures usually use forced air to speed up the conduction of heat to the coils. The main object of the sharp freezer is to freeze quickly, to prevent deterioration, and to maintain the original physical condition of the meat cells. Locker-room temperatures vary from 0° to 17° F. in Minnesota plants. Many plants were and still are using 15° as an upper limit. However, there is a trend toward lower temperatures; many plants now use temperatures with a range of 8° to 10° above zero. The lower temperatures permit longer storage with less danger of rancidity in meat, excessive enzyme activity in all products, and loss of moisture.

Table 2. Advantages of Locker Storage as Reported by Patrons

	Number mentioning each item
Improvements over the farm-processed food supply	
Fresh meats throughout the year	136
Eliminates waste and spoilage	36
Expert cutting	9
Greater variety of meats	9
Fruits and vegetables may be stored	6
Labor saving	
Elimination of canning	81
Elimination of slaughtering and cutting	25
Advantages over retail buying	
Saving	119
More suitable quality of meat	69
More convenient	26

ADVANTAGES OF LOCKER AS COMPARED TO FARM PROCESSING

The advantages of the locker as a method of preserving or processing foods for the farm family are many and varied, depending on the type of livestock in the community, the standard of living and income level in the community, the type or kind of food processing and handling service previously available, the type of locker plant established and kind of service rendered, and the charges for the services of such a plant.

The advantages of a locker as reported by 235 Minnesota locker patrons[1] are grouped in table 2 under three headings: First, improvements in the meat supply; second, labor saving; third, advantages over retail buying. The number at the right in the table indicates how many reported the advantage listed.

Improvement in the food supply is without question the most important of all the advantages of the locker for the average farm family. Fresh meat through the warm months of the year is probably the most important consideration in this group. The locker may also eliminate losses in meat during the winter months; deterioration and spoilage often take place when attempts are made to store fresh meat without refrigeration.

If the meat cutting is done by the locker plant the cuts are more likely to be uniform in shape, size, and thickness, and the trained man will cut the carcass in such a way as to secure more of the desirable cuts. Furthermore, having each package stamped or labeled enables the housewife to know what each cut is so that she can cook it correctly and secure greater variety in the menus.

The locker also makes it possible to preserve in the frozen-fresh form other farm-raised foods such as lamb, poultry, fruits, and vegetables to add variety to the menus of farm families who have been depending on home-processed products.

The possible elimination of canning, meat cutting, and slaughtering on the farm is another possibility of the locker method of preserving foods. Though the added cost of such service may not be entirely offset by savings in labor for the farmer, it is possible that the use of these services will divert his labor to more profitable alternatives and also improve the product.

ADVANTAGES OVER PURCHASE AT RETAIL

The first advantage of the locker over purchase at the retail butcher shop as listed by Minnesota locker patrons is the matter of savings.

Because there has been some misunderstanding in regard to the amount of savings possible through the use of the locker by farm families, the following analysis based on a study of meat marketing margins by Bernard F. Tobin of the

[1] The analysis of the advantages and disadvantages or criticisms was based on the answers of 235 patrons of five locker plants in reply to a questionnaire sent out in 1938.

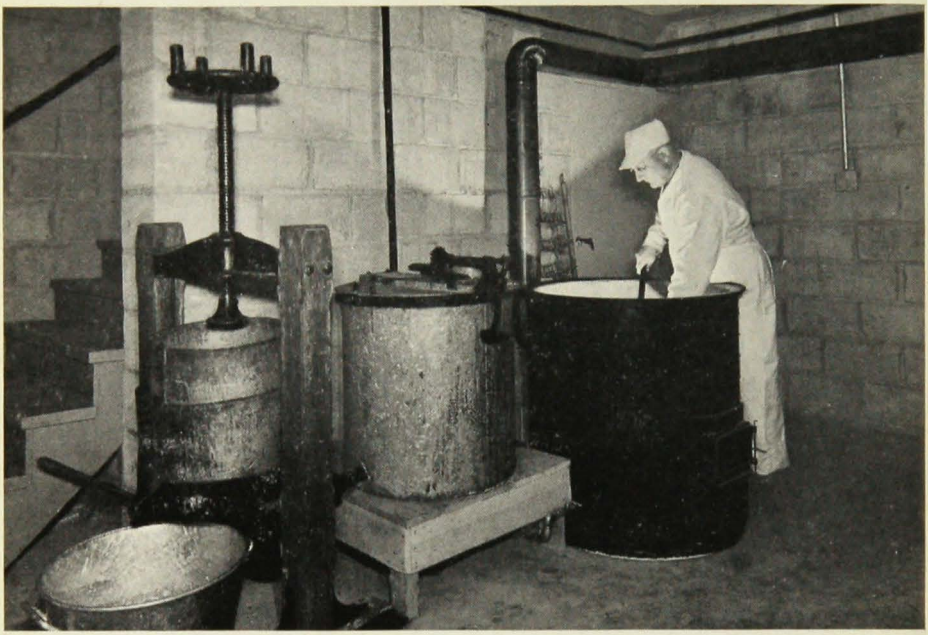

FIG. 3. LARD RENDERING SERVICE AT THE LOCKER PLANT IS APPRECIATED BY MANY HOUSEWIVES

University of Chicago and Howard Greer of the Institute of Meat Packers is presented along with locker cost items based on the usual charges made for the various services rendered by Minnesota plants.

Table 3 indicates the average farm value of 100 pounds dressed beef over the ten years 1925-1934 and the average cost of handling that beef through regular marketing channels during the same period. The cost of handling 100 pounds of beef by the locker method is figured on the basis of the usual processing charges and a rental cost of two cents a pound. The latter is based on the assumption that the $10 locker rental is spread over 500 pounds of meat. A similar method is followed for pork in table 4.

Tables 3 and 4 demonstrate that the savings on beef are greater by about 4 cents a pound than those on pork. This is due largely to the difference of $3.60 per hundred pounds in the cost of marketing, processing, and distribution, though to some extent the difference results from the greater costs involved in processing hams, bacon, and lard at the locker plant.

In addition to savings, the locker has a second advantage over purchase at retail, that is, the possibility of securing a quality or grade of meat, especially beef, more suitable to the tastes or pocketbook of the family. This is likely to be true especially in small communities

Table 3. A Comparison of Costs of 100 Pounds of Beef at Retail and Processing at the Locker Plant

Retail		
Farm value (100 lbs. dressed)*	$11.20	
Marketing, processing, and distribution cost*	12.50	
10-year average retail value 100 lbs. beef		$23.70
Locker method		
Farm value of beef (100 lbs.)*	11.20	
Slaughtering (based on $1.50 per head)	0.35	
Cutting, chilling, wrapping, and freezing (at 1¢ per lb.)	1.00	
Grinding (15 lbs. at 1¢ per lb.)	0.15	
Locker rent (500 lb. at $10.00 or 2¢ per lb.)	2.00	
Total cost per 100 lbs. beef (processed by locker method)		$14.70
Difference or saving (9¢ per lb.)		$ 9.00

* Based on a 10-year average, 1925-1934. The Consumer's Meat Dollar, p. 10. Tobin and Greer. University of Chicago Press.

made up of a wide range of income groups. In such communities the retail butcher shop, because of limited volume from each group, is forced to strike an average and furnish a limited range of quality or grade of meat, especially beef. By using the locker for storage, families may buy quarters, halves, or kill animals of the grade desired.

The above analysis of savings effected through the use of a locker by farm families may not apply to a particular situation because locker, marketing, processing, wholesaling, and distributing costs vary, not only from year to year, but from one area and community

Table 4. A Comparison of Costs of 100 Pounds of Pork at Retail and Processing at the Locker Plant

Retail		
Farm value (100 lbs. pork dressed)*	$10.50	
Marketing, processing, distribution cost*	8.90	
Total retail cost of 100 lbs. pork		$19.40
Locker method		
Farm value of 100 lbs. pork*	10.50	
Slaughtering cost per 100 lbs. ($1.00 per head)	0.60	
Cutting, chilling, wrapping, and freezing (at 1¢ per lb.)	1.00	
Grinding lard and sausage (25 lbs. at 1¢)	0.25	
Rendering (16 lbs. lard at 2¢)	0.32	
Curing and smoking hams and bacon (24 lbs. at 3¢)	0.72	
Locker rental (2¢ per lb. on fresh pork)	1.20	
Total cost 100 lbs. pork (locker method)		$14.59
Saving over retail cost		$ 4.81

* Based on a 10-year average, 1925-1934. The Consumer's Meat Dollar, p. 10. Tobin and Greer. University of Chicago Press.

to another. Gross yearly savings for the farm family will also depend on the amount of their meat supply ordinarily purchased at retail. Most Minnesota farm families probably purchase less than one third of their meat at the retail shop.

To some patrons the locker plant, with its locker room open more hours of the day and week, is more convenient than the butcher shop.

DISADVANTAGES OF THE LOCKER

The criticisms or disadvantages of the cold-storage locker as listed by the 235 locker patrons reporting in the survey are summarized in table 5. These criticisms have been grouped into three sections: First, those which are fundamental or unavoidable; second, those which may be the result of faulty plant operation or plant management; third, those which result from a lack of patron understanding.

In the first group the most important single criticism is the greater cash outlay for locker service when compared to meat processing on the farm. Studies indicate that it will cost the average farm family anywhere from 15 to 25 dollars annually for locker-plant service, depending on the rental and service charges and the amount of services used such as slaughtering, curing, and smoking. In some areas this will be a major factor limiting the use of lockers by farm families. A second fundamental weakness for some patrons is the distance to the locker plant and the necessity for special trips to secure the meat supply. Where the farmer does not make regular trips to the locker location for other purposes, the inconvenience may offset the advantages.

To effect the greatest saving in the use of a locker, it is necessary to store and use quarters, sides, or whole carcasses. This necessitates eating all cuts of meat. This is a disadvantage for those who desire only the better cuts from the carcass. For those who buy all their meats, this system has the added

Table 5. Criticisms or Disadvantages of Locker Storage as Reported by Patrons

	Number mentioning each item
Fundamental disadvantages	
Distance to locker plant and necessity of special trips to secure meat, or inconvenience	31
More expensive than home preservation	18
Using cheaper cuts	2
Criticisms resulting from faulty operation or facilities	
Rancidity in pork	13
Locker boxes too small	10
Dehydration or drying of product stored	8
Lack of information on contents in locker	2
Criticism resulting from lack of understanding	
Slowness of thawing out	11
Keeping meat after taking from the locker	4

disadvantage of a large advance cash outlay for the purchase of quarters or whole carcasses.

The second group of criticisms arise in the main from weaknesses in plant operation or facilities, which may be corrected. First in this group is rancidity of pork. This may result from delay in freezing, which may be either before the carcass is taken to the chill room or in the chill room before it is cut and frozen. The sooner the pork is frozen after slaughter, the longer it may be stored in the locker. Another possible source of this trouble is high temperature in the locker room. The closer the temperature is to zero, the longer the pork may be stored, though it will not store so long as beef.

For the greatest convenience, the usual locker box (17x20x30), which holds 180 to 225 pounds of meat, may be too small for the larger families. This situation has been corrected in some plants by the installation of some larger lockers which will hold 300 to 350 pounds. Many patrons have criticized the locker system because they did not know how many packages of each cut they had in the locker and they did not know where to look for a certain package. This situation can be corrected by listing the number of packages of each cut and by systematic packing in the locker.

Some loss of moisture or dehydration of products stored is to some extent inevitable. However, excessive dehydration, which may affect the palatability of the product, may be prevented through proper wrapping and by using good wrapping material. Good refrigeration engineering, which will aid in maintaining high relative humidity and constant temperatures in the locker room, is another means of preventing excessive drying.

A few Minnesota patrons criticized the locker because of the time necessary for thawing meat. This criticism seems unjustified. Home economics research at University Farm, St. Paul,[2] indicates meat can be thawed while cooking with satisfactory results.

The difficulty of keeping meat after it is taken from the locker can be overcome by wrapping meat in newspaper or other material to insulate it from warm air. Keep the meat frozen and it will not spoil. Once thawed, it should be cooked as soon as possible. It will not keep so long as fresh meat.

LOCKER RENTAL AND SERVICE CHARGES

The charges made for the various services rendered by locker plants vary considerably. This is inevitable in a new development, but some of the differences will be leveled out as operating costs become known. Some variation will continue to exist because of variations in power costs, size of plant and hence efficiency, quality of service, taxes, labor, and costs of plant.

[2] See Agri. Ext. Bul. 189, Thawing and Cooking Frozen Meat, Alice M. Child. University Farm, St. Paul.

Locker Rentals

The annual charge for lockers varies from $6.00 to $12.50 for the usual size of locker (width 20 inches, height 17 inches, length 30 inches, capacity 200 pounds). The lower tiers of lockers when constructed as drawers usually rent for $12.50, or somewhat more than the upper lockers of the "reach in" type. The difference results from the greater convenience of this type, its location, and in some cases its greater capacity. The upper tier of lockers rents for less than average because of the inconvenience in obtaining packages from them. The usual charge for the middle tiers of lockers in Minnesota is $10 a year, although some plants in northwestern Minnesota charge only $6. Recently some of the plants have installed both large and small lockers to take care of families of various sizes. This permits adjustment of rental charges to patron use, and encourages the small families to use lockers.

Rental charges for lockers on a monthly basis vary from 75 cents to $1.50, with $1.25 the usual charge. Many operators find collection and bookkeeping difficult if patrons rent on a monthly basis. Hence, they attempt to make the spread between monthly and annual payments such that it pays to rent on an annual basis. As an inducement to the new patron to change to a yearly basis, many operators offer to apply monthly rentals on a yearly contract.

Extra locker charges are usually $1 a month. When there is no charge or too low a charge, patrons leave packages in the extra lockers when they have room for them

Table 6. The Variations and Usual Rental and Service Charges in Minnesota Locker Plants

	Range	Usual
Rent (varies with size and convenience)		
Annual	$6.00 to 12.85	$10.00
Monthly	.50 to 1.50	1.00
Extra lockers (per month)	0 to 1.50	1.00
Slaughtering per head (varies with weight)		
Hogs (to 300 lbs.)	.75 to 2.00	1.00
Beef (to 800 lbs.)	1.00 to 3.00	1.50
Veal	.75 to 1.25	1.00
Sheep	.75 to 1.25	1.00
Charge for mileage (per mile)	0 to .10	0
Chill, cut, wrap, freeze (per 100 lbs.)	.65 to 1.50	1.00
Grinding (per 100 lbs.)	0 to 1.25	1.00
Curing (per lb.)	.02 to .04	.02
Smoking (per lb.)	.01 to .02	.01
Sausage making (per lb.)	.01 to .02	.015
Rendering lard (per lb.)	.02 to .03	.025
Dressing, drawing, and wrapping chicks (per head)	.07 to .15	.10
Dressing, drawing, and wrapping ducks (per head)	.12 to .25	.25
Dressing, drawing, and wrapping geese (per head)	.17 to .35	.30
Dressing, drawing, and wrapping turkeys (per head)	.17 to .35	.25
Freezing fruits and vegetables (per lb.)	0 to .05	.02

FIG. 4. MOST PLANTS HAVE DRAWER-TYPE LOCKERS AS THE BOTTOM ROW

Some plants have two rows of drawer-type lockers as in the illustration. These are convenient and usually rent for $2.00 more than the "reach in" type. A well-lighted room aids patrons in selecting packages.

in their original lockers, and this cuts down the potential patron capacity of the locker room.

Slaughtering Charges

Slaughtering for locker plants in Minnesota is handled in several ways. Usually the locker butcher goes to the farm with his own or the plant truck, butchers the animal on the farm, and makes a flat charge of $1 for hogs up to 300 pounds (liveweight) and $1.50 for heavier ones; $1.50 for beef cattle up to 800 pounds and $2 for heavier ones, and $1 for veal and sheep. Many plants also make a milage charge. Most plants, however, will let the farmer slaughter and deliver the carcass to the plant if he wishes, and pick up the live animals at the farm for mileage charge. Others have farmers deliver the live animals to the plant slaughter house at their own expense. The plant slaughter house has an advantage from the standpoint of plant labor efficiency,[3] and hence slaughter charges should be less than when killing is done at the farm.

Chilling, Cutting, Wrapping, and Freezing Charges

Though the term "cutting" is commonly used in describing the servicing of meats for the locker, this phase of the locker plant operation really involves chilling,

[3] One plant furnishes trailers.

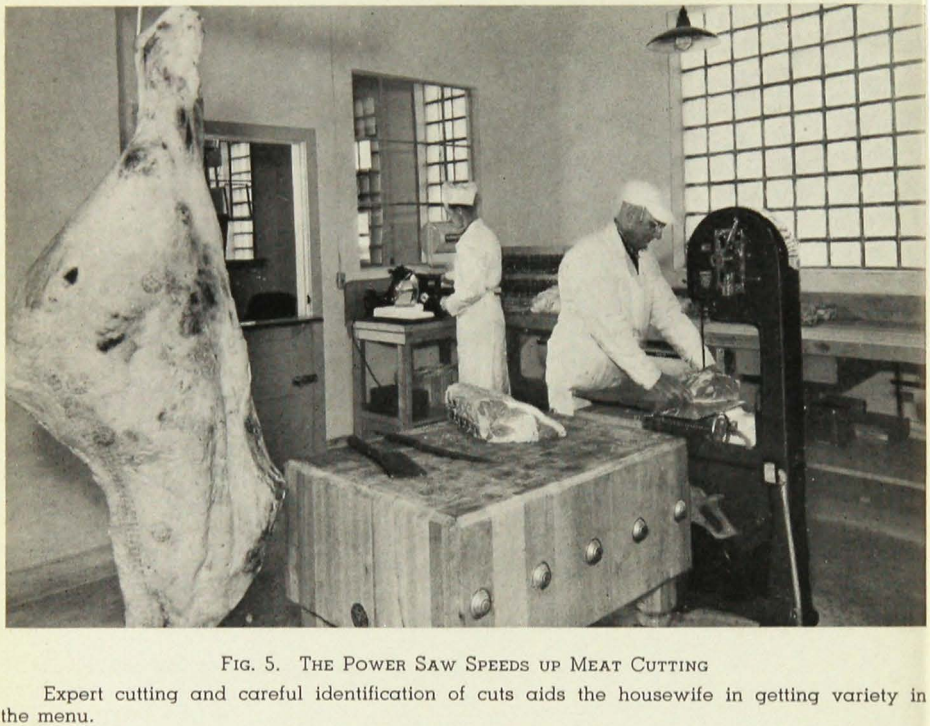

FIG. 5. THE POWER SAW SPEEDS UP MEAT CUTTING

Expert cutting and careful identification of cuts aids the housewife in getting variety in the menu.

cutting, wrapping, and freezing. The usual charge is $1.00 per hundredweight, with some plants charging $0.65 and other $1.50. If all the above costs[4] are charged against this operation, it seems unlikely that it can be done for much less than $1.25 per hundredweight. The plants with the large volume have lower costs as a rule. The flat or per carcass method of charging for cutting is not equitable either from the standpoint of the patrons or the plant.

Miscellaneous

As indicated in the table, miscellaneous service charges vary considerably. Some standardization would be desirable and is likely in the future. In no case is a plant justified in rendering such services free for by doing so it is shifting costs to other services.

Owing to the lack of information and cost experience in locker plant operation, many charges are now either too low or too high. Patrons must recognize this fact when changes are made in the schedule of charges. In the same plant one charge may be too low and another too high; this may penalize one group and cause them to use other methods. When all charges are too low to care for costs and furnish a reasonable profit to the operator, he is likely to employ incompetent

[4] Approximate: power and water $0.18; paper 0.12; interest, depreciation, and taxes 0.19; light, heat, telephone, and miscellaneous 0.15; labor, management, and records 0.65; total $1.29.

help and let equipment go unrepaired, with a resulting lowering of the standards of service. On the other hand, operators must recognize that excessive charges invite wasteful competition and may drive the marginal patron group to other methods of handling or securing their meats.

FRUIT AND VEGETABLE STORAGE IN LOCKERS

Though some Minnesota locker patrons have stored both fruits and vegetables in lockers, the results have not always been satisfactory. Much of the difficulty is traceable to one or more errors in handling or processing, particularly delays in freezing, improper scalding of vegetables, improper solutions of salt or sugar, and poor packaging.[5] Some of the difficulties with vegetables are due to locker room temperatures of 15° F., which authorities agree is too high for satisfactory results when products are to be stored for several months. The closer the temperature is to zero, the better the product will store.

The other major factor limiting the use of lockers for the storage of fruits and vegetables is the cost involved. It may be divided into three items: rental cost per unit of product stored, container cost, and freezing and handling cost.

Rental cost per unit of product stored, which is the most important of the three, is governed by the following four factors: annual, monthly, and extra locker rental rates; the number of containers or pounds of product that can be stored in a given space at one time; the extent to which the partially vacated space in the locker can be utilized by filling with similar or different products during the period the locker is rented, and the length of time in storage.

In table 7 the variations in costs which may result from the last three factors are demonstrated. It has been assumed that annual rental is fixed at $10 a year and that

Table 7. Factors Affecting the Rental Cost of Storing Fruits and Vegetables in Lockers

	Glass pints	Glass quarts	Round paperboard quarts
Dry product per container (ounces)	8	17	17
Containers locker will hold*	135	70	95
Capacity of locker in lbs. of dry product	67.5	74	95.5
Rental cost per lb. (all of annual rent $10.00) (cents) †	14.8	13.5	10.4
Rental cost per lb. (¾ of annual rent $7.50) (cents) ‡	11.1	10.1	7.8
Rental cost per lb. (6 mos. extra locker $6.00) (cents) §	8.8	8.1	6.7

* Using lockers having inside dimensions of 17"x20"x30".

† Charging all of annual rental to fruits and vegetables.

‡ Assuming that one fourth the annual rental was charged to meat or other products stored in the vacated space.

§ Assuming an extra locker was rented for this storage at $1.00 per month.

[5] Specific directions may be obtained by writing for Extension Bulletin 200, Frozen Fruits and Vegetables for Home Use, University Farm, St. Paul, Minn.

extra lockers can be rented for $1 a month. It has also been assumed that it is possible to pack (in lockers with inside dimensions of 17″x 20″x30″) 135 glass pint jars, 70 glass quart jars, and 90 paperboard quarts, the pints presumably holding 8 ounces and the quarts 17 ounces of dry product, that is, without considering the brine, sugar or other preservative. It will be noted that the size and shape of containers cause a marked difference in the storage capacity of the locker in total pounds. With glass pints the capacity is 67.5 pounds, 74 pounds with glass quarts, and 95.5 pounds with paperboard quarts. If a square carton could be used, the capacity might be increased even more. The variation in capacity causes a significant difference in the storage cost per pound.

The effect of utilization of space may be noted by comparing the per pound cost of storage where the usual $10 was charged with cases in which only $7.50 was charged. In the latter case it was assumed that during the latter part of the fruit and vegetable storage season some of the vacated space might be utilized for storing meats that could not be packed in the meat locker. Under certain conditions it is possible that even more than $2.50 might have been charged to meat storage during this period.

The fourth and last factor in rental cost is the length of time in storage. Many plants will not rent by the month, and those that do rent by the month charge relatively high prices. It was assumed, therefore, that the patron has one locker rented by the year for meat and that an extra locker may be rented for $1.00 a month. As shown in table 7, this reduces the rental cost to 6.7 cents per pound when paperboard quarts are used. This cost might be reduced still further by utilizing vacated space for meat storage during the latter part of the six-month period.

In considering the savings in rental by the use of paperboard containers, the patron must keep in mind that they must be replaced each year. This replacement cost may offset the advantage over glass jars where breakage and rubbers would be the only cost for containers.

In addition to the cost of rental and containers, there is a freezing and handling charge which varies from nothing to 5 cents a pound.

From the above analysis it appears that cost per pound of dry product stored might range from a possible low of 5 cents to a high of 20 cents. This emphasizes the need for a careful study and consideration of cost factors by the patron who is going to use the locker for this purpose.

UNIVERSITY FARM, ST. PAUL, MINNESOTA

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