THE ARRANGEMENT OF RECTANGULAR DAIRY BARNs

BY R. S. HULCE AND W. B. NEVENS

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THE ARRANGEMENT OF RECTANGULAR DAIRY BARNs

By R. S. HULCE, Associate in Milk Production, and W. B. NEVENS, Assistant in Dairy Husbandry

The proper housing of dairy cattle is a subject of increasing importance among Illinois dairymen. Many inquiries concerning dairy barn arrangements reach the Department of Dairy Husbandry. This circular has been written with the purpose of answering, so far as possible, these inquiries. Since the management of the herd is largely dependent upon the character of the barn arrangements, the subject has been presented with the idea of facilitating good herd management.

While each person desires to build according to his individual needs so far as location, type, and size are concerned, dairymen, after years of experience, have adopted certain general arrangements for the dairy barn which have been found to provide conditions favorable for the production of clean milk and to give comfort and convenience at a moderate cost. Recent developments in construction have aided greatly in reducing the amount of building material required and in increasing the conveniences. Careful planning before building will help, not only to secure the best utilization of space, but also to prevent the development of undesirable features.

The barn should be so constructed that it will provide comfortable quarters for the animals. This is especially necessary in regions where the stock must be kept sheltered from the cold for a considerable portion of the year. Some of the factors insuring comfort are warmth, the admission of plenty of sunlight and fresh air, and the proper size and arrangement of stall, gutter, and manger.

In determining the size of barn to build, the present as well as the future size of the herd should be considered. In most cases it is desirable to plan the barn so that additions can conveniently be made. The investment per cow will depend upon such factors as climate, prices received for stock and product, and the cost of building materials. Since these factors are so variable, it is impossible to set limits within which the investment should fall in order to make it possible to realize a reasonable return.

It is not necessary to build elaborately nor to use the most expensive materials in order to satisfactorily house dairy cattle. It is essential that the roof be waterproof, the sides windproof, and the stable floor durable and sanitary. It is necessary also to provide adequate storage for both concentrates and roughages, especially where cows are barn-fed throughout the winter season, as is the case in Illinois.
TYPES OF RECTANGULAR DAIRY BARNs

Two-story or loft barns

The ordinary two-story, or loft, barn is a type well adapted to level country, where driveways to the second floor are not readily built. The walls are usually built of wood but may be of masonry construction. A barn of this type is one of the most practicable for housing dairy cattle since the stable is entirely above ground and therefore easily lighted and ventilated. (Fig. 1.)

BASEMENT BARNs

The basement, or bank, barn is commonly built where the topography is such that a driveway to the second story is readily constructed. The first story, or basement, with walls of masonry construction, forms the stable, and the upper part, most frequently of wood construction, is used principally for feed storage, although machinery may be stored in the driveway. (Fig. 2.) The principal objection to many barns of this type is that the stable is insufficiently lighted, since one or two walls of the basement are next to the bank. Bank barns are, as a rule, poorly ventilated, and this is largely responsible for the condensation of moisture on the masonry walls. When well lighted and properly ventilated, basement barns give satisfactory service.
The one-story barn is arranged so that the dairy herd occupies a stable which has no overhead storage, the storage barn usually being built at one end of the stable. (Fig. 3.) This arrangement has been advocated by those who maintain that feed stored above the cows is detrimental to the production of high grade milk on account of the sifting thru of dust. Studies at this station, however, indicate that overhead storage has no appreciable effect upon the quality of the milk if a tight floor or ceiling is placed above the stable to prevent the dust from coming thru from the loft.

With this type of barn the work of feeding is somewhat greater, and there is an additional roof area to be maintained as compared with the two-story barn. The objection of the cost of a greater roof area is partially offset by the fact that a deeper mow is provided; which means not only more cubic feet of storage space under the same roof area, but also that more hay can be stored per cubic foot, since the deeper the mow the more solidly does hay pack.
If the drainage is good, no floor is necessary in the storage barn. Also, the barn need not be so strongly constructed as is necessary when a load is carried on the second floor.

Covered Barnyard or Loose-Stabling System

By permitting cows to run loose in a large shed or covered barnyard, except at milking time, a large amount of labor involved in the daily cleaning of the stable is eliminated. The manure may be removed when convenient by loading it directly into a manure spreader. Another advantage is that the cows are free to exercise at all times except at the milking hour. (Fig. 4.)

Under the loose-stabling system the roughage is fed in racks in the covered yard, and the grain in the milking stable at milking time according to the requirements of the individual cows. As certain cows in the herd may be a source of continual annoyance on account of their fighting other members of the herd, care should be taken that timid animals secure their share of the roughage.

The stable may or may not be directly adjoining the covered yard, and may accommodate all or only a part of the herd at one time. In case only a part of the herd can be accommodated at a time, one group is turned out after being milked, and another brought in. The size of the milking stable should be such that the time required to milk one group is sufficient for the cows of that group to eat their grain.

A minimum of about 65 square feet of floor space, exclusive of mangers, should be provided in the covered yard for each cow of the
large breeds, and about one-fourth less for the small breeds. A greater space than this can be used to advantage. In order to keep the cows clean a large amount of bedding must be used daily.

**COMBINATION DAIRY AND HORSE BARNs**

On many dairy farms it is not feasible or economical to build a separate barn for horses, especially when not more than six horses are kept. A few horses are more economically housed in connection with other live stock than when provided with separate shelter; and the daily chores are much lightened by such an arrangement. The problem of keeping the odors of the horse barn from the cow stable can best be solved by separating the two by a tight partition. (Fig. 5.)

**FACTORS TO BE CONSIDERED IN LOCATING A DAIRY BARN**

Details of barn location will vary; but there are certain general points that should always receive careful attention. Because of fire risk, it is well to have the farm buildings fairly well distributed; on the other hand, the matter of convenience limits their distribution. The housing of young stock must be taken into account, as well as the possible location of yards, milk room, and silo.

**HOUSING OF YOUNG STOCK**

For convenience, it is advisable to have the barn for the young stock connected with the main dairy barn.

The young stock may occupy a portion of the main cow barn, but there are several reasons why it is preferable to have them somewhat isolated from the rest of the herd. When the calf is removed from the dam, it means less disturbance to her if the calf does not remain near. Again, it often happens that an odor develops in the calf barn that would be objectionable in the milking barn. In the winter, the calves, if isolated, may be spared a certain amount of exposure as a result of the opening of doors necessary to carry on the regular dairy barn operations.

On the other hand, the portion of the dairy barn occupied by the mature animals is materially warmed in winter by the animal heat given off. If the calves are in this portion of the barn, the temperature in cold weather will be more favorable for them than if they are isolated.

The location of the calf pens on the south or the east side of the barn is preferable, as the outdoor yards connecting with the pens will then be protected from either the north or the west winds.
BASEMENT FLOOR PLAN
MODEL BARN ON WISCONSIN STATE FAIR GROUNDS.

Fig. 5.—A Conveniently Arranged Barn for Housing Six Horses in Connection with Cows and Young Stock
(Courtesy James Manufacturing Company)
LOCATION OF YARDS

A consideration of prime importance in choosing the site for the dairy barn is that it shall have good drainage. The yards should slope away from the barn, the main floor of the barn being above the level of the yard in order to avoid the possibility of water entering.

It is very desirable that the barn be located so that the yards, so far as possible, are to the south of it in order that the stock, when turned out in winter, may get the benefit of the sunshine, and that the barn may act as a windbreak to the yard.

LOCATION OF THE MILK ROOM

The convenience of getting the milk from the barn to the milk room, and the desirability of having the milk room located away from the barnyard and silo and in a place where good drainage can be secured, are the important factors to be considered in deciding upon the location of the milk room. If the milk room is not directly connected with the barn, there is less likelihood of its becoming filled with stable odors.

LOCATION OF THE SILO

The silo located outside of the barn gives satisfaction when connection is secured by means of a passageway separated from the barn by doors. If the passageway is large enough to accommodate the silage cart, the cart and any excess silage which it may contain can be shut in the passageway and left between feeding times. This will tend to keep the silage odors from the barn and to lessen the attraction for flies in summer. The location must be such that the silo is easy of access to wagons and machinery at filling times.

LIGHTING

The best lighting in a rectangular barn is secured when the barn extends north and south. Four square feet of glass per cow provides an amount of light commonly accepted as a standard. A wall containing a number of windows costs but little more than a wall of lumber or masonry.

Many bank, or basement, barns are insufficiently lighted. Where basement barns are built on a side hill, the wall of the first story that is next to the bank should extend above the ground far enough to allow windows to be placed in it, or the bank should be excavated as shown in Fig. 6. The windows should be placed in the upper part of the stable wall rather than the lower, even on the exposed sides of the barn, in order to admit sunlight farther into the interior, and to
FIG. 6.—METHOD OF BUILDING A BANK BARN OR OF REMODELING A BANK BARN ALREADY BUILT IN ORDER TO ADMIT LIGHT AND FRESH AIR ON BOTH SIDES

The areaway should have a shallow gutter of sufficient slope to carry away surface water. (Modified from drawings by Louden Machinery Company)
lessen window breakage by the cows. The windows should be placed vertically rather than horizontally, and located so that there is an even distribution of light. The half masonry type of barn, with three to four feet of masonry wall, allows a convenient placing of windows.

VENTILATION

An abundance of fresh air is quite generally recognized as essential to the health of animals. In housing dairy cattle a close system is often practiced which results, not only in lowering the vitality of the cows, but in making easy the spread of infectious diseases. Since dairy cows are maintained in the herd for a longer time than are some of our other farm animals, there is greater chance for the development and spread of disease, and a greater necessity, therefore, for a constant and abundant supply of fresh air.

METHOD OF ADMITTING AIR

In admitting fresh air to the barn in cold weather, drafts on the cows should be avoided. By having the window sashes hinged at the bottom, the windows can be opened inward and the fresh air admitted without causing a direct draft.

The use of properly constructed flues with the inner openings near the ceiling of the stable aids in furnishing a constant supply of fresh air without causing drafts on the animals. To prevent direct drafts and to prevent air flowing outward, the inlet flues should have a vertical length of at least three feet. The outside opening should be protected by a heavy wire mesh or grate to prevent obstruction of the flue. The inside opening should be provided with either a common iron register or a board damper, so that the amount of cold air entering can be regulated on very cold or windy days.

It is desirable that the inlet flues be so arranged that the fresh air enters near the heads of the animals. This is accomplished when the cows face the walls of the barn by letting the fresh air enter just inside the stable wall. When the cows face in, two adjacent floor joists, ceiled over, may form an extension to the flue so that the fresh air enters at the middle of the stable between the two rows of cows. The inlet flues are best distributed in the side walls in such a way that the fresh air enters every twelve or fourteen feet.

FOUL AIR FLUES

The foul air flues should be as large as convenience will permit, and as straight as possible. It is important that the flues extend above the ridge or highest part of the barn, so that the wind blowing across
Fig. 7.—Plan showing flues so installed that the inlet flues open near the cows’ heads and the foul air flues open near the gutters. A: Where cows face in. B: Where cows face out.

(Courtesy Hunt, Helm, Ferris & Company)
Fig. 8.—Plan Showing Flues so Located that the Fresh Air is Admitted near the Cows' Heads and Distributed to All Parts of the Stable as Indicated by the Arrows. Foul Air Flues Open near the Gutters. A: Where Cows Face In. B: Where Cows Face Out
(Courtesy Hunt, Helm, Ferris & Company)
the top of the flue will draw the air out. If the top of the flue is lower than the ridge of the barn, the wind tends to blow down into it.

Altho foul air flues cannot always be located at the most advantageous points from the standpoint of their maximum efficiency, on account of their obstructing passageways or haymows, still it is pos-

**Fig. 9.—Details of Inlet Flue Where Cows Face In**
(Courtesy Hunt, Helm, Ferris & Company)

possible, by the use of dressed lumber, smooth joints, and as few turns as possible, to construct flues which will provide the desired amount of ventilation. (Fig. 11.)

According to King, a flue two feet square and thirty feet high, should, under ordinary conditions, remove the foul air from a stable

--F. H. King, Ventilation for Dwellings, Rural Schools and Stables, page 120.
FIG. 10.—INLET FLUE WHERE COWS FACE OUT

A window hinged at the bottom and having V-shaped galvanized shields at the sides is also shown. (Courtesy Hunt, Helm, Ferris & Company)
built for twenty cows. The total cross sectional area of the foul-air flues should at least equal that of the inlet flues.

A wooden slide or large register for regulating the size of the opening at the floor is desirable. A damper or door in the flue near the ceiling, that can be left open for a few minutes to start a draft in the flue or to cool the stable in summer, is an advantage.

**Fig. 11.—Construction of Foul Air Flue**

The size of the opening at the floor may be regulated by the slide. (Courtesy Hunt, Helm, Ferris & Company)
FIRST FLOOR ARRANGEMENT

In determining the arrangement of the cow stalls, feed rooms, and young stock quarters, the chief considerations are convenience, the comfort of the animals, and a type of construction which will facilitate the maintenance of clean conditions.

ARRANGEMENT OF STALLS

There are two general methods of arranging the cow stalls when they are placed in two rows lengthwise of the barn. One is termed "cows facing in," when one row of cows faces another; the second, "cows facing out," when both rows face the walls.
A barn that accommodates two rows of cows is easily lighted, and the feeding and cleaning operations are readily performed. A barn wide enough to accommodate more than two rows of cows is seldom advisable, since such a barn is difficult to light and to ventilate, and the barn operations are not so conveniently carried on. Whether the cows face in or out is largely a matter of individual preference; each arrangement has its advantages and its disadvantages.

*Cows Facing In.*—One advantage of having the cows face toward the center of the barn is the greater convenience in feeding. All feeding is done from one alley, thus minimizing labor. Another advantage is the possibility of cheaper construction. Altho 36 feet is a desirable width for a cow stable, the barn can be built two feet narrower when the cows face in and there is no driveway thru the center. Columns supporting the second floor may be placed at the curb between the stalls, thus taking up space in the stalls where it is needed least, and leaving all passageways free. This arrangement in a barn 34 or 36 feet wide makes the three spans of floor joists about equal in length.

*Cows Facing Out.*—There are several advantages in having the cows face the walls of the barn. The barn is easily cleaned, as the
manure can be loaded directly into a manure spreader without the use of a litter carrier and hauled thru the central driveway. This arrangement is probably most advantageous with a large herd of cows, where there are one or more loads of manure to be handled daily.

With the cows facing the walls of the barn, construction is somewhat more expensive. The columns must be placed near the edge of the platform to make the three spans equal, thus taking up needed space. If placed at the manger curb, the center span must carry a much heavier load than the other spans.

Some breeders consider that cows present the most attractive appearance when facing out.

![Interior of Stable Where Cows Face Out](image)

**FIG. 14.—INTERIOR OF STABLE WHERE COWS FACE OUT**

A well lighted and conveniently arranged stable

**CONSTRUCTION OF STALLS**

**Size.**—The stall, in order to be comfortable, must have sufficient size. Unless the length is such that the cows are properly aligned on the gutter, it is difficult to keep them clean. Holsteins require a stall 4 feet 8 inches to 5 feet 2 inches in length from the gutter to the edge of the curb on which the stanchion is fastened. For Jerseys, a length of 4 feet 4 inches to 4 feet 10 inches is sufficient. The width of the
average stall is about 3 feet 6 inches, but this may be varied according to the size of the animal. The variation in the length of stall is readily obtained by constructing the platform so that it is 6 inches longer at one end of the barn than at the other, as shown in Fig. 16. In a barn having two rows of cows lengthwise of the barn, the widest parts of the two platforms may be at opposite ends of the barn, thus keeping the alleys and driveways of uniform width. Where cows face in,

If desired, the barn for cows facing in can be built two feet narrower than where a driveway for cleaning the barn is used. Fig. 17 shows the method of varying the length of platform.

the feeding alley runs slightly diagonally thru the barn, and where the cows face out the driveway runs diagonally.

It is well to have a division between cows to prevent possible injury to teats by cows stepping on one another. Bent steel tubing, having one end imbedded in the floor and the other end fastened at the manger, is satisfactory for this purpose.
Floors.—The floor of the stall, as well as that of the entire stable may well be constructed of concrete, since this material absorbs but little moisture, is economical, durable, and easily cleaned. A concrete floor should be kept well bedded in winter, as it conducts heat from the body of the cow more rapidly than most other floor materials. At a small additional expense, an area 2½ feet square in the floor of the stall near the gutter may be laid with cork bricks or creosoted wood blocks. These materials do not readily conduct heat from the body of the animal, and the stall is thus made more comfortable. If desired, the entire stall may be floored with cork brick or wood blocks, with the exception of a concrete curb 5 to 6 inches wide next to the gutter to hold the bricks or blocks in place. The concrete in the stall floors and in all walks over which the cows pass should be left somewhat rough to prevent the animals from slipping.

Fig. 16.—Floor Plan, Not to Scale, Illustrating the Method of Varying the Length of Platform to Suit Different Sized Cows

The feed alley, walks, manger, and gutter remain uniform in width.
A depression in the floor of the stall next to the manger, one inch deep and extending back eighteen inches, assists in retaining bedding in the front part of the stall. The entire stall should have a slope of one inch toward the gutter.

**Gutter.**—The gutter is one of the important parts of the stable. Its size and shape determine to a large extent the ease with which cows are kept clean while stabled. A gutter 18 inches wide and 8 inches to 10 inches deep on its side next to the platform provides space for the accumulation of manure during a period of twelve hours without making it necessary for the cows to lie in the droppings. (See Fig. 15.)

The walk back of the gutter should not be more than 4 or 5 inches higher than the floor of the gutter. Where the walk and platform are both from 8 to 10 inches higher than the gutter, there is a greater likelihood that the cow will be injured in case she slips into the gutter.

Bedding should be used in sufficient quantities to absorb the liquid excrement, but if this is not possible, a drain at one end of the gutter should conduct the liquid to a cistern outside. In such a case, the floor of the gutter should have a slope of one-half inch away from the platform and a slope of one inch in twenty feet toward the drain.

**Manger.**—Two types of mangers are illustrated in Figs. 15 and 17. Which type is the more desirable is largely a matter of preference. The built-up manger assists in retaining roughage, but it makes the cleaning of the manger and feeding alley more difficult. If mangers
without fronts are used, cows tend to reach forward into the feed alley for feed which has been pushed out of the manger, and in doing so slip and bruise their knees.

The general tendency is to make mangers too small rather than too large. The width of the manger at the top should not be less than $2\frac{1}{2}$ feet, while a width of 3 feet is desirable. The bottom of the manger should be narrow, and the front should slant so that the feed tends to roll down toward the cows. (See Fig. 15.)

Mangers are preferably constructed in part or entirely of concrete. A well-constructed concrete manger is durable and easily cleaned. Steel manger divisions, or steel manger fronts with divisions, may be purchased ready to install. Companies making such equipment furnish directions and forms for constructing the concrete work, thus simplifying the installation.

Wooden mangers are not desirable unless the cost of concrete is prohibitive, since wood is not easily cleaned or disinfected. If length of service is considered, concrete mangers are the more economical.

**Stanchion or Tie.**—The swinging, or adjustable, stanchion is one of the best devices for fastening cows. It allows considerable freedom when the cow rises or lies down, and permits her to turn her head from side to side. Rarely, if ever, does a cow lie down in the pasture with her head stretched straight forward, as she is compelled to do in the old style rigid stanchion.

![Fig. 18.—Bull Paddock and Shelter](image-url)
FEED ROOM

A feed room should be provided that is of sufficient size and easily accessible. Whether it is on the first or second floor will depend on the general arrangement of the barn. If the feed room is on the first floor, storage bins above may have spouts leading to it. If it is on the second floor, the barn is presumably of the basement type and spouts should lead from the feed room to a bin or cart below. If a feed cart holding enough grain for one feeding for all the stock is used, it makes little difference whether the feed room is at the center or at the end of the barn, so far as economy of time in feeding is concerned.

BULL QUARTERS

The bull quarters need not be elaborate, but they should provide shelter and a strongly fenced paddock in which the bull may exercise. Lack of exercise has a tendency to make most bulls sluggish, inactive, and less sure as breeders. (Fig. 18.)
For shelter, either a box stall in one corner of the barn or a separate shed will answer the purpose. The box stall or shed may well have a floor space of at least 144 square feet. If the drainage is good, a dirt floor properly bedded is sufficient. The quarters may be arranged so that it is not necessary for the caretaker to enter the bull stall.

**Young Stock Quarters**

Adequate and convenient calf stalls and pens greatly facilitate the work of raising the young stock.

With a herd of forty grade cows, accommodations for young stock should include pens for twelve to fifteen calves, stalls for ten to twelve yearling heifers, and a few box stalls for the cows. The bull pen can be located in this wing.

Since calf stalls require a large amount of bedding, it is convenient to have this wing of the barn two stories high in order to permit the storage of bedding in the loft. Bedding for the entire herd can be stored here, and if straw is used, it can be put in directly from the threshing machine.

To assist in maintaining a comfortable temperature in winter, the ceiling of the first story of the calf barn should be built one to two feet lower than that of the dairy barn, which usually has a height of
eight to nine feet. For the same purpose, there should be as few doors as convenience will permit, and a moderate amount of window space.

The calf barn need not be more than 30 feet wide. If wider than this, the pens are either too long or more space than necessary is provided in the feeding alley. For calves under six months of age, at least 20 square feet of floor space per calf should be provided, exclusive of the manger. It is desirable that stanchions be provided for use at feeding time.

![Fig. 21.—Heifer Stalls, Showing Continuous Concrete Manger](image)

This section may readily be made into box stalls by means of the swinging gates.

A convenient arrangement for cleaning the calf barn is to have the track for the litter carrier connect both the main barn and the calf barn, so that the same carrier may be used for both barns.

Fig. 8 (A) shows an uneconomical arrangement of pens. The cleaning alley back of the pens could be dispensed with, and the floor space used for the pens, the latter arrangement requiring considerably less material for pen walls.

The floor of the pens shown in Fig. 19 slopes uniformly from the front and rear at the rate of 1 inch in 4 feet to a point 3 feet from the
barn wall. This helps to keep the front part of the pen dry and is of especial value where an abundance of bedding is not available, or where the calf pens are cleaned occasionally with water.

Yearling heifers require about 40 square feet per head when running loose in the barn, but somewhat less when stanchioned. Figs. 21 and 22 show arrangements whereby the area devoted to stalls for yearlings may be partitioned off into box stalls or maternity pens by means of swinging gates. When not in use, the gates fasten against the wall. The stall platform for heifers of the large dairy breeds should measure from 3 feet 10 inches to 4 feet 6 inches in length, while the width need not exceed 3 feet. For heifers of the small dairy breeds, the platform should be from 3 feet 4 inches to 4 feet long and not over 2 feet 10 inches wide.

THE COW YARD

A yard is a necessary accessory to the dairy barn, but its care is very often neglected. Frequently a very fine barn is located in a poorly drained spot where the cows must wade thru mud up to their knees to reach it, or in winter must wait in an unprotected yard having a north or west exposure. The yard need not be large, but it should be sheltered so that the cows can be turned out for daily exercise, except possibly on very cold or stormy days. As protection for the yard is most needed on the north and west sides, the barn, where possible, should furnish shelter on these two sides. Board or masonry walls six feet or more in height may be used as a protection on the south and east sides.

A level yard, or one with pockets, soon becomes filthy, and the cows are not easily kept clean during a wet period. In any yard, after a time the manure becomes mixed with the soil and tends to hold moisture. Paving the yard with soft coal cinders or gravel aids in preventing an accumulation of mud, but the cinders or gravel must be renewed frequently. Concrete paving, where not too expensive, is quite satisfactory. A yard that is paved can be easily cleaned, and a large amount of manure, which would otherwise be mixed with the gravel or soil and lost can be saved and hauled to the fields.

SUGGESTED STABLE ARRANGEMENT

The floor plan shown in Fig. 22 may be used as a general guide in planning a dairy barn. It provides stalls for twenty cows, pens for young stock, a bull pen, a tool room, feed rooms, and a silo. When constructed after this plan, the barn can readily be enlarged to accommodate a larger herd whenever desired, without changing the arrangement of stalls, pens, or feed rooms. The same location of the milk
Fig. 22—SUGGESTED STABLE ARRANGEMENT
house will be found convenient whether the barn is constructed for twenty or for forty cows. For dimensions of the stalls, see page 19.

The feed rooms may be built one story high, or the main barn may be extended as a two-story structure as far as the silos. It is assumed that more than one silo will be necessary for a large herd, or that a second silo may be desired for summer feeding. Hence, if two silos are not built at once, it is desirable to locate the first silo at one side of the center line of the barn.

![Silos](image)

**Fig. 23.—Plan Showing Location of Silos at Corner of Barn**

Silos may also be located at side of barn, or at end, as shown in Fig. 22.

In the barn for young stock, pens are provided on the south side for calves, and stalls on the north side for heifers. With this arrangement the calf lots are protected from the north and west winds. At each end of the row of mangers in the calf pens, a section of manger may be hinged so that it will swing inward, thus forming a gate in such a way as to leave in the manger all the space possible. The section for heifers may be converted into box stalls by means of swinging gates. These box stalls, as well as some of the calf pens, may be used
for cows at calving time. The manure from the young stock barn may be removed either thru a side door or thru the same exit as the manure from the cow stable.

EXPERIMENT STATION PUBLICATIONS ON BARNs AND MILK HOUSES


