

about the right number of animals in the given stable, allowing, say, from 600 to 880 cubic feet of air space for each cow two years old and over. This condition existing, there should then be provided about 15 square inches or more of controlled outlet area and about eight square inches or more of controlled inlet area for each animal in the stable. For instance, a stable 36 x 30 x 10, which might be expected to accommodate 18 or 20 head, should have an outlet about 18 inches square or 20 inches in diameter, if round, and the inlets should be at least six inches by 12 inches and two in number.

By controlled inlets and outlets is meant that it should be possible to cut off the whole or any part of the inlet and outlet by means of some kind of damper or key.

The controls are necessary for the reason that very cold air being a great deal heavier than warm air compels a very much more rapid circulation or inflow and outflow of air in very cold weather than in warm. This must be controlled or temperatures will fall too low in cold weather and rise too high in warm weather.

The dimensions of shafts or outlets and inlets given above allow for friction of air currents in the shaft, for while eight to ten square inches per head in outlet area might be sufficient in very large stables, the same relative area in a small stable would certainly be found faulty. Outlet shafts must be neither too small nor too large. Where materially exceeding the area per head given above, they are likely to work unsatisfactorily and to be constantly dripping in warm weather and freezing in cold, due to the air currents being too sluggish. Where less in area by any considerable amount, they are sure to be wet and dripping practically all the time, and to carry impure air off too slowly.

Many systems of ventilation have been devised and advocated. The perfect system has not yet been thought out. It is, besides, practically certain that a system capable of operating satisfactorily under any set of conditions that might be imposed never will be constructed. During the last ten years, Prof. Grisdale has tested out some thirty of forty different schemes, systems or devices for ventilating farm buildings such as cow barns, horse barns and piggeries, and has, during that time, learned two things very thoroughly. These two items of information well-learned are:

- (1.) Good ventilation is a necessary and very profitable feature of any stable.
- (2.) No known system of ventilation is absolutely automatic or faultless.

It has also been possible to come to some conclusion as to the relative merits and adaptability of the various systems tried out. Many systems have shown more or less effectiveness, but of the thirty and odd systems experimented with, the system commonly known as the Rutherford System of Ventilation has proven much superior to any other tried. The superiority of this system is due to various features, the chief being:—

- (1.) Ease in installation, in buildings old or new.
- (2.) Adaptability to all classes of stables.
- (3.) Suitability to variety of weather and climate.
- (4.) Facility of operation and control.
- (5.) Effectiveness in control of temperature in all parts of stable.

As just stated, it is susceptible of easy introduction into old stables, and may be readily and conveniently installed in new buildings. A study of diagrams given will show probably the best relative positions for inlets and outlets. There is, however, but slight objection to any number of other possible or necessary different arrangements.

Diagram A, showing floor plan of a stable for, relative positions of fresh air intakes A A A A say, 16 cattle, also illustrates probably the best and foul air outlets B B (beginning of shaft in ceiling, see W D, diagram B). This arrangement suits where nothing in the use to be made of loft or superstructure interferes in any way.

If a horse fork is to be used in the superstructure, then it might be necessary to change positions of B B to C C where shafts would need to be constructed as shown in Diagram B by dotted lines W G D. The fact of the outlet shaft changing directions at G and D will not interfere materially with its efficiency. These outlet shafts, provided they are staunchly built as described further on, may take almost any desired course so long as it is always more or less upwards.

The area indicated, one foot by two feet each, or four square feet for the two outlet shafts, is somewhat greater than is really necessary, but it is much better to have shafts slightly larger than any smaller than the minimum of 15 square inches per cow mentioned above.

The intakes A A A A might, if necessary, be changed to pass under or through walls at D D D D, say seven inches by twelve inches. This new arrangement would be advisable in case outlet openings had to be placed as C C.

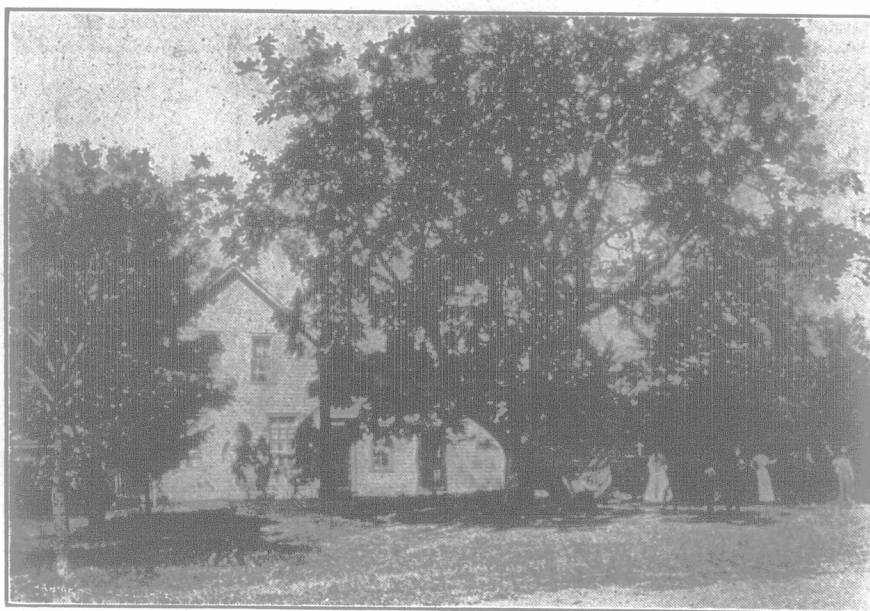
In the intakes, fresh air enters at one, passes under wall and enter stable at 2, with an upward tendency. The wall, 3, should be about

six inches thick, and on this wall should be built the little guard shown at M in diagram B. The inner wall corresponding to 3, need not be over four inches thick.

The outlet shaft for foul air, W D, should be in duplicate and should be about one foot by two feet inside measurement. The best construction is boards running vertically, two ply with inside airspace and two papers between. The opening at the top should be roofed, (see B). The roof should be supported on four posts, A A, leaving a clear space about 15 or 16 inches between top of shaft and bottom of roof B. The amount of air to escape by these shafts in any given time may be controlled by means of a key as at E. The key may be regulated by cords F F. The key should never be entirely closed. Where the shafts are large enough, there is no objection to their being used as chutes for feed or litter, but care should be taken to so hang the door as to insure its remaining tightly closed when not held open to allow of shaft being used as a chute.

The fresh air inlets require careful consideration. The method on the left is very simple of installation. The passage through from K to I should be about twelve inches by seven inches, the greater dimension being horizontal. K is a protection or roof, H the intake, I the outlet into the stable through which the air passes with an upward tendency. J is a guard or board so placed as to direct air currents upwards. To do this, it will need to extend about four inches above top of opening through wall. It will, of course, be nailed to the projecting seven-inch sides of this fresh-air shaft inside the building, just as K will be nailed to the same sides outside the building. These passages might be controlled by means of small keys or hinged covers, but it is not usually necessary or advisable to so control the intake shafts.

The method on the right hand side admits air by the passage N, 12 inches by seven inches be-



Beautiful Surroundings.

The farm home of Richard Robinson, Welland Co., Ont. Note the large tree in the foreground.

low the level of the floor. Air enters this passage at L under shelter of the snow and rain guard M and flows into the stable at O, with an upward tendency. The cement or wooden guard X is to prevent dirt or dust being knocked or swept in. The top or opening should be protected by a grating of some description. It is possible, but seldom necessary or advisable, to provide these inlets with keys or controls. If it is found necessary to use some system of control Z had better be outside the building, but inside the guard cabin M where it can be regulated by a cord passing out at P.

The careful installation of this system of ventilation, with either method of fresh air intake, will insure an abundance of good fresh air at all times, provided it is allowed to operate. If, however, it is left to the mercies of the average hired man, it, like any other system, will be found useless.

To get best results in ventilating any stable and to insure a comfortable, dry building possible of being kept well ventilated, clean and hygienic, attention to the following small details in construction will be found very helpful.

1. Use simple fixings. 2. Ceil under joists.
3. Put in all the windows the superstructure will permit. 4. Let windows be high. (See cut).
5. Hinge windows in middle at C. 6. Use chains as at V to allow them to open inwards at top. 7. Provide double windows for winter. 8. Walls should be built to include air space. Starting from the outside inward, the following will be found satisfactory: Battens R, inch dressed lumber, two tar papers, studding two by six and air space S, two tar papers, V-joint.

Silo Opening.

The silos will soon be open and winter feeding begun. Many will open their silo for the first time in its history and much depends upon their adventures in compounding rations in which silage figures as a part.

Bear in mind that much of the good derived from this fodder comes from its succulent nature as well as from the food material which it contains. It does not answer all the requirements of the animal body and must be supplemented with hay and grain. The amount dairy cattle will profitably consume depends upon the size of the animal and the amount of milk produced. A 1,200 to 1,300-pound cow, giving 40 pounds of milk, testing three to four per cent., should receive about 40 pounds of silage; 10 pounds clover hay, and eight to ten pounds of grain mixture made up of oil-cake meal, bran and chop. A smaller cow, yielding 30 pounds of milk, would require 30 pounds silage; 10 pounds clover hay and 7 to 10 pounds grain mixture. They should clean up the manger at each feed, and a wise herdsman will slightly underfeed rather than have the stock mess over the fodder and leave some in the manger. When silage is fed directly after milking, odors are less likely to be noticed later in the milk.

Stockers and beef cattle will consume a considerable amount, but the quantity fed will depend largely on the other roughage at hand. Twenty-five, thirty or thirty-five pounds, varying with the quantity of roots, corn stover or grain to be disposed of, will not be out of the way. Roots, corn stover, hay, oil meal, corn and chop all help to make up the ration and the feeder should so balance the mixture that each fodder do a certain service in the economy of the animal system. Breeding cows will do equally well on a liberal allowance of silage and be in better condition at calving time than if hay and grain

constituted the entire daily mixture. When the calves are being weaned they too will take kindly to a small boxful of silage. They require some dry matter and silage will furnish it along with succulence and palatability. They may be given all they will clean up and by the time they are one year old they will consume about one-half as much as mature stock.

Good silage, not mouldy or frozen, is greedily devoured from the sheep rack with no unfavorable results. The feeding of silage to sheep has been discouraged by some, but it is hard to locate a case where care was taken, that good silage fed to sheep, in reasonable quantities, brought about bad results. One to five pounds have been fed daily to sheep, but the exact amount depends upon the sheep's grain box, roots and other available roughage. Two to four pounds per day is as much as should be fed and in case of ewes in lamb two to three pounds is sufficient till after lambing when the allowance might be increased. One to three pounds gives good results with feeding lambs, but where hay and grain are fed liberally besides they will only consume one to two pounds per day. Watch the flock carefully and do not feed sour, mouldy, or frozen silage.

THE FARM.

What is Wrong with Our Economics?

Editor "The Farmer's Advocate":

The cost of living, which has been going up and up in every part of the civilized world, has soared higher in Canada, statisticians tell us, than in any other civilized country. And the worst (or best, according to the point of view), is yet to come. Dollar-a-pound beefsteak is predicted in the not very distant future by a Chicago man, quoted as an authority. A carping critic, a mere man, no doubt, wrote a letter to a Toronto paper the other day blaming our modern city women for the high price of beefsteak. In their haste to be off to the matinee, or for a gad in the department stores, said the mere man, many women have no time left to cook a decent meal which requires time in preparation, and so a hurried call is made at the butcher's shop on