

pede, guard against it by a thickening of the coat and laying on of flesh, both of which are essential to them to withstand the severe cold of winter.

Let us "look on this picture and on that."

We find in the great prairies of the North-West (the home of the buffalo, the antelope, and other wild animals of the graminivorous order), the grasses during the summer are luxuriant and succulent—They rarely seed, hence the albumenoids remain in the stalks, which, drying on the roots, yet retain sufficient circulation to preserve them from the destructive evaporation which leaves nothing but a dry, innutritious, brittle fibre, as seen on our domestic grasses propagated under cultivation and from seed. Hence, we find, as winter and cold weather approaches, these wild animals become fat, their coats long and thick, and winter finds them prepared for it. What do we find within the cultivated regions? the plough has upturned the native grasses, and seed-producing grasses have replaced them, which, nutritious and succulent before seeding, after seeding, become fibrous and innutritious, owing to the albumenoids being transferred from the plant to the seed: hence, we find that our domestic animals, if fed on grass alone late in the autumn, instead of laying on flesh as the wild animals do, lose flesh, and become rough and hide-bound.

From this, then, we learn that our animals should begin the winter in fat condition: hence, late pasturing is inadvisable, and where, from economical motives, they are kept out late in autumn, grain, in moderate quantity, should be given to replace the albumenoids in which the ripened grasses are deficient.

Our readers will find it an economy to begin the winter with their stock in good condition. It will cost less to keep them fat during winter than to make them fat if poor.

A thrifty farmer will first calculate the quantities of his crop in relation to the number of animals he has to feed, and will then know what he has to sell. He should never, as many do, sell what he has marketable, and try to carry his animals through the winter on the refuse, with, often, a scanty supply of that.

We should never forget that we should only borrow from the soil those nutritious products rich in the elements of which the animal body is composed, pass them through the alimentary canals of our animals, then return the plant-food to the soil again, in the form of manure, enriched perhaps by the addition of nitrogenous elements derived from oil-cake, cottonseed-cake, or other richer products of other soils.

Next in importance to feeding for the winter is *housing*. The natural heat of the body is produced by the active chemical operations constantly going on in connection with digestion and respiration in the living animal. It is well known that farinaceous and oleaginous foods are heat producers: hence, we find that in cold climates the latter especially are instinctively consumed by man and beast. It is also a clear inference, that the more food an animal requires to produce heat, the less he can apply to produce enlargement or growth of body—hence we deduce the lesson, that to prevent the food being consumed as fuel, and insure its being applied to growth and development, we should lessen as much as possible the necessity for such production of animal heat, by the substitution of artificial heat. This can be done by warm housing and clothing. Let our readers think this problem out, and practise what the inference teaches.

Starting with the assumption (which is correct) that animal heat is necessary to animal life, and that it is produced chiefly by chemical action in connection with digestion and respiration, will be evident that the proportionate generation of heat will depend, first, on the heat-producing quality of the food supplied, and, secondly, on the quantity of such animal heat required

to compensate for the expenditure. In other words, the colder the atmosphere in which the animal lives, the greater will be the expenditure of heat and heat-producing food, and the converse is equally true. The warmer, (within a healthy degree) the byre or stable is, the less the demand for heat-producing food, which is also fat-producing. It is merely, then, a matter of calculation to determine whether it pays a farmer or stock-owner to minimise the expenditure of animal heat, produced by food (which means money), by providing warm, comfortable accommodation in the form of good buildings, or to expose his stock to cold and inclement weather, relying on the animal heat produced by food alone.

We will forestall their calculations by the statement of the fact that experience has demonstrated that every argument is in favour of warm housing. Every experienced cattle-feeder knows that he can save a large percentage of food by keeping the feeding stock warm. Many carry the idea too far, to the injury of the animals' health; but all know that an animal kept in a warm stable will do with nearly one third less food than one in a cold or exposed one.

It is therefore quite evident to any one conversant with the farm buildings of this province that sufficient warmth is not provided artificially by good buildings. By all means, have the wooden walls clapboarded, if possible lined, and filled in with sawdust or some suitable filling; let the damp, cold stone-wall be lined; let the doors be made to fit close, and be doubled where much exposed; bank round the foundations and make the stock-houses warm and comfortable. Do not however produce heat, as is too often the case, by leaving great heaps of manure in the stable; on the contrary, make sure of pure air at all times by ventilation and cleanliness.

Let our readers try it for this winter: drain and ventilate but keep warm; and we can assure them of a very great saving in food and a decided improvement in their stock.

(To be continued.)

#### De Omnibus Rebus.

Mr McEachran has again begun to contribute to the Journal. I call the attention of our readers to his first paragraph: it is almost impossible for any one to keep on writing scientific articles without knowing on what points his readers are likely to desire information.

**THE VINEYARD.** On Michaelmas day, I paid a visit to Mr Ferguson's vineyard at Pointe Claire. The season, as my readers know, has been far from a propitious one for the grape-crop, and I must confess I was surprised at the flourishing state of the vines. Two years ago, the land was a mass of weeds, and the vines, utterly neglected, grew as like an English untrimmed hedge as possible. In 1881, Mr Ferguson began the difficult task of restoration, and he has really done wonders in the short time he has been about it. I don't mean to say that the cultivation is perfect; that could hardly be expected; but there are very few weeds to be seen, and though the land would have been all the better for another stroke or two of the horse-grubber; still, the work has been more than fairly done. The soil is of varied quality, from stiffish clay to light sand, and is on the *boulder-clay* formation. One remarkable fact was presented for study: the best land produced the strongest and healthiest vines, and the largest crop of grapes; but the berries were much later in ripening than where the soil was inferior. Does not this teach us that, in a climate like ours, where the ripening is every thing, the later grapes, if grown they must be, should be planted in the poorest parts of the vineyard? if I must say what I think, it would be better to reject them altogether. The Champion (Talman?) was ripe, Rogers' red, no 15 was nearly ripe, but all the rest were as sour as verjuice; in fact,