

comfortable sheds for cattle; forgetful of the great physiological truth, that artificial warmth is the equivalent of costly food to a considerable extent, in the wintering of all domestic animals. In cold weather, the warm bodies of all animals radiate heat very rapidly, unless protected by fur, wool, or a covering of thick hair, like that found on deer, sheep and Polar bears. No fact in modern science is better established, than that all animal heat is the product of food consumed either a few hours before the heat is evolved, or some days or months previously, and converted into fat, which is stored up in the system to meet any contingency of defective nourishment. Animal fat is one of Nature's curious balance wheels to maintain the even course of vital functions when the ordinary supply of food is withheld from any cause whatever. Although a fat animal in the beginning of winter may be taken through with a less consumption of food than would suffice if it were poor, yet, to burn up the fat in his body to maintain the necessary degree of animal heat, instead of feeding hay, straw, cornstalks, roots or grain, is to pay full six times more for such heat than one need to pay. If we can succeed in making this fact clear to the masses who keep stock, it is to be hoped that not so many animals will be allowed to become so much poorer in the spring than they were in the fall. It is not simply their apparent surplus of fat which animals part with in cold weather when sparingly fed, but they lose also a part of their lean meat, by the daily absorption of their muscles. A lean animal has flattened, thin, impoverished muscles, as well as deficiency of fat, so that his skin and bones are nearly in close contact. It is, then, pre-eminently a practical question—What is the economical value of a pound of fat and of a pound of lean meat, sacrificed in wintering a cow or a steer, to sustain life, as compared with a pound of good hay, as ordinarily consumed for a similar purpose?

The elements in fat which are truly burnt up in the system of an animal to keep it warm, as it becomes poor from a lack of suitable food, are *carbon* and *hydrogen*. Now, let the plain farmer bear in mind this fact—that a pound of carbon in the fat of a living animal, consumed in the process of respiration, which supplies the blood with vital air for that purpose, yields no more heat to warm the body of said animal, than a pound of carbon taken into the circulation from hay, cornstalks or straw. If it were true that a pound of carbon derived from forage would replace that amount of carbon in the form of fat in the cells of a poor animal, then an animal

might subsist in part as cheaply on its own fat as on hay and straw, grain or roots. But all experience, not less than the deductions of true science, proves that a pound of common cattle food does not, and cannot possibly form over one or two ounces of fat, under the most favorable circumstances. To extract an ounce of clear fat or tallow from a pound of good hay, is more than most farmers achieve. If this statement be true, (and successful contradiction is respectfully invited, if it can be furnished,) why should any economical man allow his stock to subsist in part on their own fat and flesh, which is worth from five to fifteen cents a pound? If common forage is too expensive to give them all they really need, pray how much cheaper food for them is solid fat and lean meat? In the order of nature, life cannot be maintained without the expulsion of considerable carbon and hydrogen at every breath, derived either from food, or a part of the solids of the body. *Ema-ciation* has never been discussed, never studied as thoroughly as it ought to be. Rightly understood, it would be avoided with ten fold more care and profit than is now generally witnessed.

It is true that animals may regain their flesh after suffering much from want of food and exposure during the winter, if they do not die in the spring; but the stunt and shock given to the healthy development of every part of the system, are not so easily overcome as some suppose. Why is it that Short-horned cattle sell at such apparently extravagant prices? For no other substantial reason than the fact that this breed, by the superior keep and selections, applied to many generations, comes very early to maturity. Animals only 24 months old, give as much good flesh in the best Short-horns, as is commonly obtained from inferior stock when three, four or five years of age. Such precocious development presents many important advantages to one who breeds and fattens cattle for beef. This principle of never permitting stock to stop growing in winter no more than in summer, cannot be neglected without involving great loss. It is very much like drying off a cow when her milk is largely and healthily secreted, and then attempting to bring her lactiferous system at once back to its former condition. Nature revolts against such treatment, and the vital currents long persist in running in new channels. Physiological science teaches the necessity of *uniformity* in feeding animals the year round. They may endure through the wonderful plasticity of their various organisms and vital functions, repeated and protracted short allowance joined with an uncomfortable degree of