

ular growth, if you want flesh in its most perfect form, you find it in those animals which take plenty of exercise, and if you take any animal and restrict its exercise you alter its muscular growth; and it is because the Hereford cattle are permitted to take rather a liberal amount of exercise that the flesh which they produce is of better quality. If you want simply to produce fat, you would limit the motion of the animal and would allow it to walk as little as is consistent with health, and thus it would accumulate fat, but it would be at the cost of perfect development of the flesh, and therefore where the system of management is too restrictive, where the production of fat is persistently made the one great object, there you get this result—badly formed flesh, flesh having a fatty degeneracy, weak muscular growth, and a bad quality of meat. The great end is to obtain that happy medium that gives you the rich flesh, accompanied by a fair proportion of fat, but not to fatten to such an extent that the muscular growth shall attain to a fatty degeneration.

**QUALITY OF FOOD.**—Let us look, then, to the important question of food. As I have said before, a good threshing machine, however good it may be, cannot bring out a good sample of wheat unless it is originally present in the stack, so that, although you may have a fine quality of stock, the produce which is obtained from it depends greatly upon the character of the food which is used. You want very carefully to consider this point—as to how far the food which you are growing upon your farms is in itself of the best feeding character, and the ripeness of this food is a matter of very striking importance also. It is quite possible for crops to be grown upon the land which shall contain materials which when perfectly matured would be useful for the production of flesh, nitrogenous matter as it is termed, but so long as it is imperfectly matured it is not only incapable of producing flesh, but it encourages and often creates disease in the animals. If, therefore, the food used be imperfectly ripened, instead of doing good we find it doing much harm. Take, for instance, what you will find plenty of examples of: sheep are placed upon a crop, well, it may be of swedes or turnips. The probabilities are that they are eating food that has not been sufficiently ripened. We know the ordinary protection is to give them some dry food, and it certainly helps them, but still it was worth while remembering that the state of the sheep might arise from the food being imperfectly ripened. Take the case of swedes in particular. You have often noticed, no doubt, that up to a certain time a flock feeding upon swedes may be severely scoured, and suddenly, after, say a strong frost, it has ceased. Now, this brings us back to inquire what are the conditions which favour the ripening of food. There are two such conditions. A continuance of warmth—an early crop giving it plenty of time to become matured through a long season; but another agency which very often has to do the work is frost. While the warmth of the season does its work slowly and steadily, a strong frost will do its work suddenly, and perhaps the frost of a single night will so alter the character of a crop of swedes that the sheep do not suffer, the irritation and the scour ceases, and the crop becomes so altered as to be capable of being used for its proper purposes. By the storing of mangels changes take place that enable that class of food to be used with greater safety, and the result is that we know, practically, when the different varieties of food are ready for use. No one would think of using mangels in the autumn, and why? Because they have not ripened. They are preserved in clumps or in stacks, and the moderate warmth of these stacks gene-

rally ripens the mangels, so that, as articles of food, they become more perfect. And this extends to all kinds of food. Take hay.

You all know how imprudent it would be to make use of newly-made hay, and the same with new oats, too. The idea which is very general is that the ripening of these crops takes place in the field. It is not so. You would no more think of giving new oats to your stock than you would think of making use of new wheat for your own use. You want maturity to be secured by the further ripening of the food. Then there is another point (I am obliged only to touch upon a few) and that is the use of mixed foods. From experiments which have been made in the use of food, it is pretty clear that a good quantity of cake and grain mixed, or given concurrently, produces a larger quantity of meat than if you used the cake first and the corn afterwards. I find that the general experience throughout the country is in favour of mixed foods. Then, again, another important point is that you cannot use any food without an enormous loss being associated with it. If I had a quantity of flesh-forming matter in any vegetable form, which I wanted to convert into meat, I do not obtain in meat the whole of that flesh-forming matter which was acted upon. In some cases you only get one-thirtieth portion of it, and even under the most favourable circumstances you rarely obtain more than one third. There is, therefore, an enormous loss in turning vegetable food into the form of meat. You have, in the first place, to keep up the health of the body of the animal, and the warmth of it. Even if an animal made no progress—if it remains at the same weight from week's end to week's end—that animal would still require food, although you may get no beneficial result from it. Hence it is in the highest degree unprofitable to keep animal alive without doing something else, without their making progress. Just as it would be ridiculous for a manufacturer to keep the steam up in his boiler and his engine just on the move, but not giving it any work to do, so it is equally imprudent to keep animals living without making progress. Let the object for which you are keeping be first of all determined. If that object is to produce meat, work perseveringly to promote that object, otherwise you are keeping the steam-engine, but not permitting it to do any work. This would represent an enormous loss of food, and our most economical producers of meat are those who keep their animals steadily progressing from the time of their birth to the time they have done their work. There is no doubt that this is the true economy of meat production—to obtain, by careful breeding, animals which possess a tendency to produce rich meat and of a fat-taking character—animals that are well suited to the district in which you are going to use them, that are not too delicate, and do not carry your modification of the animals to too great an extent. Having thus secured a right and proper class of stock with which to do the work, take care that the food given is well grown and thoroughly nutritious, that it be permitted to become fully matured and ripened, and that it is economised by being freely supplied so that the work shall be carried on continuously, and without any interruption whatever. By the adoption of such a system as this, I believe that you will find that meat of the highest quality can be produced at the lowest cost.

**DISCUSSION.**—The PRESIDENT said. Professor Tanner has put the whole subject before us in a scientific way, and at the same time in a sound and a practical way as well. I think, however, one great object the Professor has in view is to encourage discussion upon the subject and as there are a number of gentlemen present who are well experienced in feeding animals, and some especially so, I hope before the evening closes we shall hear their opinions and their experiences. Although not one of the oldest feeders amongst you,

(1) In England, where the sun is not so powerful as it is here, the oats, beans, and pease, are seldom till they have been 3 months in stacks. A. R. J. F.