

to keep an animal in good health and the digestive apparatus in good working order.

Then, no doubt, you have all been told before this that you must feed a given amount of protein and carbo-hydrates and have them in exactly the right proportion, one of the former to $5\frac{1}{2}$ of the latter, to have what scientific men call a balanced ration. The protein is used largely to form the muscles, flesh or red meat of an animal's carcass, and the carbo-hydrates are used to furnish heat and energy, and what is not used for this purpose goes to form fat. There are other elements necessary in the feed besides these, but they are generally in almost all feed in sufficient quantity to supply the needs of the animal. Now, I think it is just as necessary to supply these elements in a reasonably exact proportion as it is to get the proper quantities of brick, stone, lumber, sand, lime, etc., if you are going to build a house, and it is no more difficult to do with a little study.

It is a well known fact that if any one element necessary to the animal is seriously lacking in the food, then the other elements are not fully taken in by the animal, but pass through it undigested.

It may be said we have been able to feed cattle so far without bothering with the chemical analysis of the food, and why do so now? My answer is, that we are not feeding the same foods as we did a few years ago. At that time we generally fed a fairly well balanced ration, without knowing it, perhaps. But peas are being largely dropped as cattle food, and corn is as largely taking its place. Peas are very rich in protein, while corn has a very small quantity, but is very rich in the heat and fat-forming elements, so that we are drifting away from a well-balanced ration.

A good many of us are also substituting corn ensilage for roots, which is also getting farther away from a proper proportion, unless we guard against it by feeding along with these feeds something that is rich in protein. As far as I know the cheapest and best feed for this purpose is well-cured clover hay, either from common red alsike or lucerne clover, which is the richest of all in protein, and will produce immense crops on suitable land, but is pretty difficult to cure properly, as it has to be cut very green or it becomes woody. Bran is also useful for balancing a ration, but at present prices clover is much the cheaper. In the Western States, where corn is king, feeders find from practical experience that it pays them to pay more per ton for bran than for corn rather than feed all corn. Now, I am not trying to discourage the growth of corn. I think that it is, perhaps, the cheapest and best cattle food we can grow; but don't depend wholly on the corn. The clovers and roots, either turnips, mangels, or sugar beets, are almost, if not quite, as profitable crops, and with an abundant supply of these feeds the cattle feeder should have little difficulty in carrying a herd of cattle through the winter, with the addition of a small quantity of grain for the stock that are being finished for market, and also cows that are milking heavily.

Taste vs. Keeping Quality of Butter

Butter-making competitions seem to be as popular as ever, judging by the prizes offered at the majority of the agricultural shows throughout the country, says S. A. W. in the *Scottish Farmer*. Good butter judges are, therefore, at a premium, not so much on account of lack in numbers, but because the best judges are often at a loss as to the marks to be awarded to the several distinct operations and results; and therefore they do not care to occupy the position they can, in their own judgment, only inadequately fill. It has undoubtedly occurred to many judges that the difficulty in apportioning the marks lies chiefly between the taste and the keeping quality of the sample. Why this should be so is probably unknown to them, but that such a difficulty does exist is well known to almost every butter judge in the kingdom. To put the matter clearly, taste and keeping quality are the two best properties of butter,

and they are to all intents and purposes rival qualities. To these excellent qualities all competitors aspire, and all invariably fail to satisfy themselves or their judges, although some judges, either by chance or otherwise, have given the maximum number of marks obtainable, and thus overstepped what may be termed "the bounds of rational judgment."

Looking at the matter carefully, it is at once seen that taste and good keeping quality are at variance. For to what is the taste of butter due? Not to the fat, that is quite certain, as pure butter fat is a very insipid substance; therefore, we must look to some other constituent of milk to furnish us with the necessary material to develop flavor. To anyone accustomed to dealing with milk, and especially to those engaged in its analysis, it is well known that the "nutty" taste, so much demanded by judges (and so much "hoped for" by competitors), is obtained not from the fat, but from the "solids not fat" of milk. Anyone can prove this by evaporating carefully to dryness a little milk, and then, after extracting the fat from the total solids by ether, tasting the residue. The "nutty" flavor is so pronounced that the goal of perfection appears to have been reached without the aid of the fat at all.

And now, with reference to the keeping quality. To all butter-makers it is a maxim that the purer the butter fat the better the keeping quality of the sample, and also, that to obtain pure fat as much as the caseous matter as possible must be got rid of. But what does this amount to? Is it not taking away the very substance which is necessary for the production of the nutty taste? Placing these two plain truths together, it seems rather curious that judges invariably demand a high standard in both qualities, while all the time the possession of one to the fullest extent must necessarily destroy the other. Would it not be better to sacrifice one quality in one kind of butter and attempt to improve the remaining quality or qualities, instead of trying to reach the goal of perfection by an impossible route? Remembering, however, that with reference to taste, there is a limit, beyond which the taste is not improved by the addition of caseous matter to an extent consistent with the lowering of its keeping qualities. This is the point of perfection to which all genuine butter-makers should aspire.

Free Rural Mail Delivery

There has been some discussion in the daily press of late in regard to free rural Mail delivery. We have discussed this matter frequently in these columns and are glad to see the movement spreading. The subject is deserving of the best thought of those interested in the welfare of the agriculturist and through him of the country at large. There can be no question but that a system of free rural mail delivery would be of great benefit to the farmer and would bring him more in touch with the world's great movements, thus improving his position educationally, socially and in many other ways.

Rural mail delivery has been largely developed in some sections of the United States, and the movement is spreading at a very rapid rate. This and the good roads movement should go hand in hand. The general plan is for residents along the routes selected to have mail boxes on the highway containing the mail matter they wish posted and to receive that which arrives for them. The mail wagon has a certain prescribed route to travel each day, and may be expected along at the same time every day, when, if necessary, stamps, stationery, etc., could be secured from the driver or travelling postmaster. One of the conditions necessary when a municipality applies for mail delivery is that of good roads. Without these, it would be difficult to carry out the scheme satisfactorily. So we would impress upon those sections of the Dominion where poor roads are the rule to get a hustle on and adopt such measures in road improvement as will insure their application for a free rural mail delivery, when it comes in Canada, being favorably considered.