

valuable. Therefore, in this system of feeding, you have, with some trouble and expense, produced a certain quantity of foddering material, and stored it up in your barn, only to give your animals the trouble of carrying it through their digestive organs and into the manure pile; and after all this trouble it is not worth carrying back to the field again; such a system is certainly not economical.

To make the most of your foddering material then, you must acquaint yourself with its chemical composition, and use a certain amount of care, so as to make up a daily ration in which there is the right proportion of straw, with its abundance of dry substance to give a suitable bulk to the food, of hay with its large proportion of dry substance also, and of non-nitrogenous nutritive substances, of grain, rich in nitrogenous matters, of roots, rich in sugar and starch, and of oil-cake rich in albuminoids and fat. With a ration thus carefully made up with a due regard to its chemical composition and the special needs of the animal, all the different kinds of foddering substances do the work in the animal economy for which they are best fitted, respectively, and nothing is wasted. All good stock feeders, without doubt, do this to a certain extent; but unless they have at least an approximately correct knowledge of the composition of the various materials with which they make up the ration, they must work somewhat blindly, and as is the case with all guess work, are liable to fail widely of the mark.

But in order to accomplish all this, it is by no means necessary to send samples of all your stock of fodder to the chemist every year, for analyses of it. The chemical composition of each of the various kinds of fodder produced on the farm is about the same, when grown under ordinary circumstances. Well-cured clover hay always has about the same composition, if the growing crop is treated in about the usual way; so of meadow hay, turnips, oats, corn, etc. All of these articles of fodder have been carefully analysed, and the results recorded. In Prof. Johnson's "How Crops Grow" there is a very complete and valuable series of tables, showing the ordinary chemical composition of the materials which the farmer handles in the course of his operations, in-