an average composition, such as given in the table, will be found in most cases pretty correct. But in the case of immature produce, such as meadow grass, turnips, or mangels, the composition largely depends on the stage of growth in which the plant is taken, and is also greatly affected by the character of the manuring. It may be generally stated that as a plant matures the proportion of water, nitrogenous matter, and ash constituents diminishes, while the proportion of carbo-hydrates largely increases.

The following table shows the composition of meadow grass cut at three different dates in the same field. The first cutting will represent pasture grass fed off in the green state by stock; the second cutting is good ordinary hay; the third cutting is an over-ripe hay, somewhat coarse and stemmy, but well harvested. The composition given in every case is that of the dry substance :---

COMPOSITION OF HAY HARVESTED AT DIFFERENT DATES

Date of cutting	Albumi- noids,	Fat.	Soluble carbo-hydrates	Fibre.	Ash.
May 14	17 65	3 10	40 86	22 97	15 33
June 9	11 16	2 74	43 27	31 88	7 95
June 26	8 40	2 21	43 34	38 15	7 34

Young grass in thus much richer in albuminoids, and contains a smaller proportion of indigestible fibre than older grass, and is consequently more nourishing. The same comparison may be made between young clover and that which is allowed to mature for hay Hay should always be cut immediately full bloom is reached; after this point the quality of the crop will considerably deteriorate.

While fodder crops deteriorate towards maturity from the conversion of soluble carbo-hydrates into fibre, crops such as potatoes and mangel improve, the carbo-hydrates produced in their case being respectively starch and sugar, both of them substances of great feeding value.

The influence of high manuring is naturally to increase the luxuriance of a crop; a luxuriant crop will always contain more water than one in less active growth. Very large mangels often contain only 6 per cent. of dry matter, while in the quite small roots, the proportion may be as high as 15 per cent. Luxuriance also retards maturity. A heavily manured mangel will contain, at the same date, a much smaller proportion of sugar that a similar mangel growu on poor soil. The result of high manuring is thus not only to increase the bulk of the crop, but also generally to diminish the proportion of carbo hydrates, and increase the nitrogen, ash constituents, and water. In highly manured crops, a smaller proportion of the nitrogen is probably present as albuminoids, than in crops less heavily manured and more mature.

In the case of hay the composition is further affected by the conditions of he esting Grass that has suffered from rain during haymaking will contain less soluble matter (carbo hydrates and albuminoids) than well-made hay; this loss will be greatly increased if the hay has been long in the field, and undergone fermentation as well as washing.

We may now consider the composition of the various foods given in the table.

The amount of dry matter is seen to be tolerably uniform throughout the various classes of dry foods, the foods richest in fat being generally the driest. Among the green fodder and roots, there is a considerable variation in the dry matter, potatoes containing the most, and white turnips the last.

We have already seen that albuminoids and fat are the sume; those foods which are rich in albuminoids and fat are, even then it is better to give whole grain at night.

therefore, those which, generally speaking, have the highest nourishing value. At the head of all foods in this respect stand the various descriptions of oilcale; they form, without doubt, the most concentrated food at the farmer's disposal. The leguminous seeds, as beans, peas, and lentils, are rich in albuminoids, but not in fat. The cercal grains are much poorer in albuminoids, containing only about one-half the proportion found in leguminous seeds. Of the common cereals, oats are generally the most nitrogenous, and maize the least. Oats and maize are characterized by containing more fat than the other cereal grains. The special charactcristic of all the cereal grains is their richness in an easily digested carbo hydrate, starch.

When we turn to the hay, straw, green fodder, and roots, the general composition becomes a less safe gride to the nourishing value. The nitrogen, we have already seen is here no certain measure of the proportion of albuminoids present. The fat credited to these foods is also largely composed of waxy matters, and we can hardly attribute to it the same feeding value as to an equal amount of fat in oilcake or maize. The carbo-hydrates also include various substances of no feeding value. The same weight of dry matter in crude foods of this class has thus a decidedly less nourishing value than in foods of the higher class previously mentioned, consisting entirely of matured grain. Foods belonging to different classes cannot, therefore, be safely compared on the basis of their composition.

An important element in the character of a food is the relation between its nitrogenous and non nitrogenous constituents, these two classes of ingredients performing to a considerable extent distinct functions in the body. As the non nitrogenous constituents are partly fat, and partly carbohydrates, it is usual to calculate the fat into its equivalent in starch (generally done by multiplying the fat by 244), and add the product to the other carbo hydrates of the food ; the relation of the albuminoids to the total non-nitrogenous constituents, reckoned as carbo hydrates, is then easily found. The relation in question is commonly kown as the " nutritive relation " of the food. Thus the composition of wheat grain given in the table shows a "nutritive relation" of 1: 6.6, and the composition of decorticated cotton cake a nutritive relation of 1:15. Figures thus calculated, are. however, approximate only, as we ought clearly only to take account of the constituents actually digested by the animal. We shall therefore refer to the subject again in the next section."

POULTRY DEPARTMENT.

Under the direction of Dr Andres, Beaver Hall, Montreal

Poultry feeding.

No branch of business connected with farming pays better than poultry; and it is of great importance to know just how and what to give them in order to stimulate egg production.

Both grain and soft food should be given; the latter at least once a day where eggs are sought. Wheat is probably the best grain, especially where fowls are beginning to lay. Corn tends to fatten, and should be given only occasionally to laying fowls. Buckwheat is an aid to egg production and is very warming. Oats make an excellent food, but not particularly valuable for eggs. Barley is thought by many fanciers to be one of the best varieties of winter food. If the grain is ground, a good plan is to grind together equal parts of corn, wheat, buckwheat, and oats. It makes an excellent meal for a warm mash to be given in the morning, but should not be most concentrated forms of food which an animal can con- given at night, unless the poultry house is very warm, and