

COMPOSITION OF FEEDS

Plants also contain water, ash, fat and protein. In addition to these the plants which compose the food of herbivorous animals contain a group of substances called carbohydrates (starches, sugars, etc.) which may be converted into fat or energy.

WATER.—All food-stuffs, no matter how dry they may seem, contain a considerable amount of water. In grains and dry feeds the water ranges from 3 to 15 percent of the material; in green forage and silage it is about 80 percent; while in some tubers and fleshy roots the water reaches as high as 90 percent. Water is essential to animal life, and in food it fulfills the same function as that drunk by the animal. In calculating the food value of any feeding material the water contained is, of course, not taken into consideration.

ASH.—When a food-stuff is burned until the organic matter is all driven off, the residue is the ash. It is composed largely of lime, magnesia, potash, sulphuric and phosphoric acids, and a few other oxides. The ash of the food is the source of the mineral matter found in the animal body, and as such is of importance. Ordinary combinations of feeding stuffs, however, usually contain an abundant supply of mineral matter for the use of the animal; so this is not often a matter of practical concern except as it has a bearing on the mineral elements of fertility in the manure.

FATS.—This class of substances includes the fat in the meat or butter which we eat. The proportions of fat in feeding stuffs vary within wide limits. In general, seeds and their by-products contain more fat than coarse fodder. Straws contain less fat than hays, the amount varying from one-half to one and a half percent. But little fat is found in the dry matter of roots or tubers. Corn and oats contain from four to five, while cotton-seed meal contains from eight to twelve percent of fat.

CARBOHYDRATES.—This class includes starch, sugar, gum and other minor substances, and also the fiber or woody part of plants. The first are quite freely digested; the last is much less so, tho fulfilling the same function as far as it is digested. The carbohydrates constitute the largest part of most vegetable foods. They are not stored in the body as such, but are converted into fat, or used to produce heat and energy. Since the