

a large quantity of saliva in the mouth; Consequently, unless it be mixed with coarse food requiring remastication (rumination), it is not so thoroughly digested and a considerable amount of nutritive material is unabsorbed and consequently lost.

We learn too from a study of the digestive process in cattle, that a free supply of water is necessary for the thorough digestion of the food, and the maintenance of a healthy condition of the digestive organs. When the water supply is deficient the contents of the Stomach become dry, digestion is slower and more imperfect, besides it is apt to lead to impaction of the leaves of the third compartment.

*Food of animals by Dr. R. D. Thompson.*—It has been a subject of discussion with physiologists whether the chyle or incipient blood is taken up in the small intestines. Upon this question it appears that no small degree of light may be thrown by a consideration of some circumstances in the feeding of cattle which are sufficiently striking. As cows are continually feeding during the whole day, it can rarely happen that the stomach can be in any other condition than in that of engorgement, and yet the amount of water which an animal will swallow at a single draught is more than sufficient to fill the whole of the cavities of the stomach, supposing them to be empty. The following table will show the quantity of water swallowed by two cows on different occasions. The animals were placed in the weighing machine and the weight noted; they were then allowed to satisfy their thirst, and their weight was again taken.

#### BROWN COW.

Food.		Weight.		
		Before drinking.	After drinking.	Water swallowed
		lbs.	lbs.	lbs.
Augt. 12	Barley, molasses, and hay. }	1010.....	1038.....	28
" 19	Malt and hay.....	998½.....	1041.....	42½
" 29	" ".....	1023½.....	1048½.....	25
Sept. 4	Barley, linseed, and hay. }	991.....	1055.....	63

#### WHITE COW.

Food.		Weight.		
		Before drinking.	After drinking.	Water swallowed
		lbs.	lbs.	lbs.
Augt. 12	Barley, molasses, and hay. }	1052.....	1106.....	54
" 26	Malt and hay.....	1029.....	1051.....	23
Sept. 4	Barley, linseed, and hay. }	1056.....	1104.....	48
" 13	Beans and hay.....	1060.....	1087.....	27

It will be observed that in the fourth experiment with the brown cow, the animal swallowed at one draught sixty-three pounds weight of water, or nearly six gallons. Now it is evident that in these trials the water must have passed thorough the stomach into the intestines; this observation is supported by Sir Benjamin Brodie, Bell, Coleman and others. Of course it will readily be understood that animals fed on succulent grass will require less water in proportion to the quantity of water contained in their food; but the whole study of the digestive organs in cattle show that a large quantity of fluid is necessary to thorough digestion. From this we infer that, as in the natural, so in the artificial feeding, cattle should have their food in a moist condition. We learn also from this that the stomach and its appendages are principally *digestive* in their functions, the intestines furnishing the absorptive surface. "The fact of the intestines, espe-

cially the large ones, serving as a kind of reservoir for the large quantities of fluid carried into the intestinal canal, may serve also to explain the action of saline purgatives. It would appear, that when dissolved in large quantities of water, they are carried at once to the intestines which they stimulate, increasing the peristaltic motion, and thus encouraging a more intimate mixture of the aqueous and solid contents of the gut."

This fact also explains the reason why medicines should always be given to cattle in the fluid form, as the solid consistence and bulk of a bolus would lead to its passing in to the paunch, where its physiological action would be lost in the great mass of vegetable matter that sac usually contains.

**Fat Stock at Chicago.**—We took notice in our last number of the Fat Stock Show lately held at Chicago. We now reproduce from the *National Live Stock Journal* the beautiful Short Horn Steers which took 1st prizes in their respective classes.

#### The Food of Animals and feeding.

The functions of the digestive organs being toprehend, masticate and insalivate, swallow and digest the food, so as to present it in the form of chyle ready to be absorbed and carried into the blood, thence to the tissues for assimilation, the food provided to these organs must necessarily contain the substances which enter into the organization of these animals; hence we conclude that the elements of animal tissues and fluids pre-exist in vegetables, which also contain the earthy phosphate that forms so important a constituent of bone.

The food of herbivorous animals must, therefore, always contain and in fact always does contain, four essential principles which by their combination, or reunion, constitute nutritious matter properly so called: 1st an azotized matter such as albumen, casein, gluten, substance which are probably the original of flesh. 2nd an oily or fatty matter, which approaches more or less closely to fatty bodies in general. 3rd a substance having a ternary composition, sugar, gum, fecula. 4th certain salts, particularly phosphates of lime, magnesia, and iron. This mixed constitution which a forage plant must needs offer justifies the general ideas propounded by Dr. Prout on Nutrition. This able chemist has said that "milk was to be viewed as the standard food and that all alimentary matters must resemble it in composition in a greater or less degree: that is to say, besides phosphates, food must contain an azotized principle, and a fatty body to stand in lieu of casein, sugar, and butter." (*Boussingault.*)

So many different circumstances operate in lessening or increasing the amount of azotized constituents in plants, viz gluten and albumen; that it is often difficult to determine the amounts of these contained in them without a great deal of trouble. The experiments of Majendie have shown that substances which do not contain these elements, such as sugar, starch, oil, will not support life, and on the other hand, it is ascertained that the quality of alimentary matter, flour for example, increases with the amount of gluten which it contains; and it is because the seeds of the leguminous vegetables are richer in azotized principles—that is, in *flesh*—that they are also more highly nutritious than the seeds of the cereals."

Before we can proceed to the subject proper of feeding stock, a knowledge more or less perfect of the different substances which form the articles of diet for cattle is necessary, on this subject I must make use of the experiments and labours of those who have specially investigated these matters.

Hay being the most common, or universally used kind of fodder, being in fact the staple food of most of our farm animals, may serve as the standard of comparison for all other kinds of food or forage.