

plied in the form in which they came from the field. Bruised oats, and other grain, were subsequently found to be better adapted to animals than when whole. Hence the various inventions for cracking or bruising grain by machines of different sizes, adapted to hand, horse or steam power. Of late years experience—the result of the most carefully conducted experiments—has clearly shown that all kinds of cattle-food, hay, straw, grain, and roots, are more nutritious, weight for weight, when finely divided and thoroughly cooked, by the simple process of steaming. The proper relative quantities of raw and cooked food is a matter upon which experience has not yet absolutely decided. A certain proportion of food thus prepared has indisputably been shown to be highly advantageous, not only to horses but also to cattle, sheep and pigs. The boiling of linseed with chopped hay, straw, turnips, &c., till reduced to a sort of jelly, has been practised for years by the best farmers in Britain, for the fattening of cattle, and the practice has been found both efficient and economical.

It is true that the rationale of practices of this nature involves some of the most difficult questions in vital chemistry and animal physiology; and it cannot but be satisfactory to know that the more recent researches and progress made in these sciences, tend to illustrate and confirm the improved systems of breeding and feeding the domesticated animals. It would appear that the advantages of the system of finely dividing, and even cooking, the food of animals mainly consists in diminishing the force necessary for perfect mastication; thereby rendering digestion more rapid and easy, and the material principles of the food thus become more thoroughly absorbed into the animal system. It has been clearly shown that food remains in the stomach only for a certain time when it is subjected to that powerful solvent, the gastric juice; it is afterwards passed into the intestines when only the thoroughly digested portions are, by the process of absorption, converted into blood and muscle.

Refinements in cattle feeding have been carried still further within the last year or two by the invention of what is termed the "Pulping Machine," which has been in use by several farmers in the old country, and we infer from the accounts that have reached us, with much satisfaction. Several of these machines were exhibited at the recent English Show at Chester, when they were subjected to a searching trial. Hitherto it has been deemed sufficient to cut roots into slices more or less fine, according to the kind of animals to be fed. By reducing however the roots into a pulp, not only is the force of mastication reduced to a minimum, but the greatest possible surface of the material is without loss of time, brought into direct contact with the gastric juice.

It may, however, in the present state of our knowledge, fairly admit of a doubt whether there is not a risk of carrying the practice of pulping and cooking food too far. A certain amount of mastication must necessarily be performed by the animals, for which purpose nature has furnished it with teeth; the pulping machine, therefore, should be regarded only as an auxiliary. According to Liebig the chief use of saliva is to absorb the oxygen of the air, which