

In the horse these glands are very large and the secretion is unusually copious. In the mastication of the food, the saliva is intimately mixed with every portion, and, by its chemical action, prepares the food for ultimate digestion. The food thus prepared is formed into a ball or bolus, and is carried by the tongue to the pharynx, which by its contraction forces the mass into the gullet. This consists of a series of powerful muscles which by their contraction force the food into the stomach. The nerves of the mouth confer the sense of taste and also the power of motion of the numerous muscles which are called into action in the processes of mastication and swallowing. The action of swallowing is not voluntary, but of a kind known as reflex, which depends not upon the will, but upon the brain and nerves. As soon as the action of the tongue has passed the food to the pharynx, this reflex and involuntary action begins, and ends only when the food is passed completely through the intestinal canal. When the food reaches the stomach, it is immediately acted upon by the principal digestive fluid, the gastric juice. The coats of the stomach are very copiously supplied with blood by its arteries, one of which, the gastric, completely encircles the stomach by its branches. When food is received into the stomach, the circulation is excited, as are also the peculiar glands which secrete the gastric juice known as peptic glands. This secretion pours into the stomach and mixes with the food, being assisted in this by a peculiar churning action which is known as the vermicular, or wormlike, motion of the folds of the walls of the stomach. It is this gastric juice which in the calf's stomach produces the rennet used in making curd of cheese. The food when completely acted upon by the stomach is changed into a substance known as chyme, and is then forced by the peculiar motion above mentioned through the pyloric valve into the duodenum, which is the first division of the small intestines. It is connected with the liver, pancreas, and the right kidney, and receives the secretions of the liver and pancreas by the hepatic and pancreatic ducts, and these secretions mingle with the chyme contained in it. The former secretion is bile; the latter is similar to the saliva, but more powerful in its action, and seems to be specially designed to act upon the starch of the food as yet unchanged, and upon the fat. The duodenum is furnished with glands which secrete a peculiar fluid that assists in the digestion of the food and its change from chyme into a more advanced condition in which it is known as chyle. In its passage along the intestines this completely prepared food reaches its most soluble condition, and the perfect solution is absorbed by certain vessels and carried finally into the blood by a large duct known as the thoracic duct. The insoluble portion is carried onwards through the bowels and finally ejected as waste by the rectum. The consideration of this elaborate process is of great practical interest and several points are worthy of special study. As the perfect mixture of the food with the saliva is indispensable, a certain amount of mastication is necessary. Food that can be bolted then is neither economical nor fully digestible, and is likely to cause trouble in the intestines by its crude condition. On this account it would seem that dry rather than moist food, and ground rather than whole grain, are preferable, as being more likely to receive better mastication and salivation before they are swallowed. It does not appear that there is any necessity for the dilution of food with water in the stomach, because in all parts of the digestive canal from the mouth downwards there are abundant liquid secretions for the purpose of digestion. Further, it is known that water poured into the stomach is absorbed with great rapidity and passes at once into the blood by the close and fine network of veins in the coat of that organ, and that thirst is not caused by the want of water in the stomach but in the blood, and when the blood is fully supplied, the thirst is quenched. Water

then is not food, at least it is not truly an aliment in animals as in plants, because it passes at once by absorption into the blood, without decomposition into its elements as in plants; and water may be absorbed by the skin and thirst thus quenched, or the kidneys stimulated to action by its direct passage from the skin into the blood. It may therefore be considered as injurious to digestion to give an animal water with or directly after its food, but that it should be supplied sufficiently before feeding; for to fill the stomach with water when it is engaged in digesting food tends only to dilute the secretions of the stomach and to weaken their solvent action. But the water should be supplied before feeding, or otherwise the digestion may be interfered with for want of a copious supply of saliva. This reasonable deduction from the facts happens to accord with the practice and experience of practical horsemen, who have noted the effects of watering at different times. The discharge of undigested food through the bowels which is so frequently to be noticed is a waste and a constant menace to the safety of the animal. It is probable that this is caused more by mistakes in watering than in other ways. For a thirsty horse cannot grind its food because of a want of sufficient saliva to moisten it, and it is in part swallowed whole. The digestive fluids have not time to dissolve the whole grains, or even the finely ground meal swallowed without sufficient mastication, and these pass through the bowels, irritating the sensitive membranes and causing violent contractions which are known as colics, or inflammations; or they produce gases of decomposition, which being absorbed into the blood, disorder it, and produce febrile diseases, if not acute blood poisoning. Thus, while the system is weakened by insufficient nutriment it is attacked by serious disorder, and the double effect often overcomes the animal with a suddenly fatal result. Ex.

## POULTRY DEPARTMENT.

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### Diarrhœa in Fowls.

The following appears in the Fancier's Gazette, as a translation from official documents founded on information supplied by the French Epizootic Committee, and signed by Professor Galtier.

The contagious disease peculiar to poultry which is known by the name of *diarrhœa of fowls*, although it attacks equally geese, ducks, and turkeys, is the cause of serious losses to agriculture. It may be regarded as of trifling importance when it attacks a solitary bird, but it becomes a serious thing when, as is more generally the case, it finds its way into a well filled poultry yard; which it may decimate, or even depopulate, in a few weeks. The disease may however do considerable harm in our rural districts where the production of poultry and of eggs is a very lucrative business. It is possible nevertheless to stop the development of the disease, and the following hints are published for the purpose of bringing the means which ought to be used for this end to the knowledge of farmers. All breeders ought to know what *diarrhœa of fowls* is.

As soon as the birds are affected, they have a downcast look.

They become sleepy, lose their strength, do not run away when chased, the temperature of the body rises, the comb turns violet-colored in consequence of a modification in the circulation, at last death occurs, generally some hours after the appearance of the first symptoms.

Recent scientific research has established the fact that this disease is caused by a microscopic organism which develops itself in the intestines, passes into the blood, and multiplies there with extraordinary rapidity.

The parasite is discharged with the evacuations, and may