

Anatomic description of the proventriculus and gizzard of an ostrich (*Struthio camelus*)

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The ostrich is the largest bird in the world and its commercial exploitation has grown considerably in recent years. Classified as an omnivorous bird, its digestive system is adapted for this type of diet, which provides nutrients for the development of the organism and is of importance to systems involved in commercialization. The digestive system of birds has two stomachs – one glandular (proventriculus) and one muscular (gizzard). The proventriculus secretes hydrochloric acid and proteolytic enzymes. In some birds, it also has a storage function. Two types of glands predominate in this organ – the simple mucous glands (that secrete mucus) and the compound submucous glands (that secrete mucous, hydrochloric acid and pepsinogen). The gizzard is a muscular stomach in the shape of a biconvex lens. Hard particles (pebbles) are present in the gizzard of most granivore and herbivore birds and assist in grinding up hard foods between the thick gizzard muscles. The aim of the present study was to describe the macroscopic morphology of the stomach of an ostrich, observing possible differences in relation to other commercially-valued birds. The proventriculus and gizzard were collected from an adult male ostrich slaughtered on a production farm located in the interior of the state of Pernambuco (Brazil). The organs were fixed in 10% formaldehyde and later photodocumented and described. The proventriculus is an elongated, organ with spiral shape positioned craniocaudally, slightly turned ventrally and to the left in the thoracoabdominal cavity and its wall is thicker than that of the esophagus. In the interior of the proventriculus, the openings of various gland ducts and cross-sectional cuts of muscle strands were observed. The main part of the gizzard is its body, which separates the two craniodorsal and caudoventral blind sacs, which are prominent at the two extremities of the organ. It has a biconvex lens shape and is located between the proventriculus and the intestine. It is a highly muscular organ due to the food-crushing activity. Since birds do not have teeth, the gizzard does the grinding and reduction work of the ingested food particles. The inner portion of the gizzard is lined with a thin yellowish gastric cuticle, a membrane more commonly described as a “keratinoid” or “coiloid” lining. The secretion of the glands of the mucous membranes is solidified on the surface and forms the cuticle. The proventriculus and gizzard in the ostrich examined are morphologically similar to other commercialized birds.