8.8: Stomach - Ruminants (cattle, goats, sheep, cervids)

The ruminant stomach is divided into the nonglandular forestomach (rumen, reticulum, omasum) and the terminal glandular stomach, the abomasum. The distinct compartments of the ruminant forestomach warrant specific discussion here.

Rumen

The rumen is the largest (by volume) compartment of the ruminant forestomach. The primary function of the rumen is as a storage compartment to facilitate microbial (bacterial and protozoal) fermentation of ingesta. Volatile fatty acids are biproducts of this fermentation process and are readily absorbed across the ruminal mucosa into the circulation, where they serve as a directly accessible energy source. In addition, microbial digestion of fibrous ingesta begins the digestion necessary to access nutrients from ingesta that will undergo further breakdown in more distal parts of the gastrointestinal tract (e.g. abomasum).

The mucosa of the rumen varies regionally, but forms variably pronounced leaf-like papillae. The nonglandular mucosa of the rumen is composed of keratinizing stratified squamous epithelium. The rumen does not contain a muscularis mucosa.

Reticulum

The reticulum and omasum largely act to further mechanical dissociation of digesta following microbial breakdown. The mucosal surface of the reticulum is composed of long primary and shorter secondary folds that form a grossly apparent honeycomb-like pattern. As in the rumen, the reticular mucosa is composed of a keratinizing stratified squamous
epithelium. The primary folds (large papillae) of the reticulum contain bundles of smooth muscle within the lamina propria, also referred to as the muscularis mucosa.

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**Omasum**

The mucosal surface of the omasum is composed of large, thin, leaf-like structures called laminae. The microscopic structure of the omasum is similar to the reticulum in that it too contains a muscularis mucosa that extends into the laminae. In addition, the muscularis externa of the omasum extends into the laminae, which is unique to this compartment.

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**Abomasum**

The terminal chamber of the stomach of ruminants, the abomasum, is functionally and microscopically analogous (identical) to that of the simple stomach of carnivores.

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**FIGURE(S):** Ruminant Forestomach