Chapter 5
Capybara Digestive Adaptations

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5.1 Introduction

Structural polymers of plants (mainly cellulose and hemicellulose) are possibly the most widely available sources of energy from primary producers for herbivores (Parra 1978). However, such highly fibrous diet components are extremely difficult to digest and, therefore, herbivores possess specific adaptations for the digestion of these materials. The best-known, and undoubtedly the most common, adaptation to a high-fiber diet among mammals is fermentation by symbionts (bacteria, fungi, and protozoa), coupled with mechanisms for the digestion and absorption of the products of fermentation. Symbionts themselves thrive on the large amounts of vegetation swallowed by the herbivore.

Among mammals, there are two distinct types of symbiotic digestion of plant material, which differ in the position within the digestion system where fermentation occurs: (1) foregut fermentation, present in Artiodactyla (bovids, including antelopes, cervids, etc.), and (2) hindgut fermentation, adopted by Perissodactyla (horses, tapirs), Lagomorpha (rabbits and hares), and many rodents (Hirakawa 2001, 2002). Different anatomical, physiological, and even behavioral adaptations are observed in each of these two kinds of herbivores, allowing them to thrive on the plants they eat. Thus, foregut fermenters usually perform rumination, where foodstuffs processed by symbionts in a modified stomach (the rumen) are regurgitated, chewed a second time (ruminants "chew the cud"), swallowed, and then moved directly to the regular stomach, bypassing the rumen and continuing to the small intestine, where the digested products of the symbionts' fermentation are absorbed.

Hindgut fermenters use the cecum, located between the small and large intestines, as a fermentation chamber, which precludes regurgitation and re-swallowing of

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