African black rhinoceros wild populations have decreased 97 percent since the 1960s, mainly as a result of poaching and the species is classified as Critically Endangered. Captive populations are managed to ensure survival of the species, however, these animals experience diseases not observed in wild populations, including a high prevalence of iron overload disorder. Excessive iron accumulation can be fatal and is a precursor for other diseases. Black rhinoceros are browsing herbivores and naturally consume a diet with high concentrations of compounds, such as tannins, which bind iron and reduce iron bioavailability. Many researchers suggest incorporating tannins into black rhinoceros diets in captivity may prevent iron overload disorder development. Grape production industry by-products, such as grape pomace and grape seed extract, are economical sources of concentrated tannins and were evaluated for potential application in black rhinoceros diets as iron chelators. Variable effects of tannins on microbial fermentation have been reported, making it imperative to determine grape seed extract effects on black rhinoceros fermentation. Horses have similar gastrointestinal anatomy as rhinoceros, and are often used to assess diets or supplements for rhinoceros. Therefore, evaluating the use of a domestic horse model for black rhinoceros fermentation is crucial. Objectives of the second experiment were to compare fermentation and nutrient digestibility between the black rhinoceros and domestic horse and to examine grape seed extract effects on microbial fermentation. Results supported the horse as an adequate model for microbial fermentation in the black rhinoceros. Further research is needed to compare foregut digestibility and nutrient absorption between these two species. Grape seed extract supplementation at four percent of black rhinoceros diets is not likely to harm fermentation and has potential to limit dietary iron availability, thus, preventing iron overload related disease and death in captive black rhinoceros.