

## PHARMACOKINETIC FEATURES IN THE RUMINANT

Gary D. Koritz, DVM, PhD

To determine the feasibility of constructing physiological-compartmental models of oral drug absorption in ruminants, prednisolone was administered intravenously and into the rumen, abomasum and small intestine of six sheep previously prepared with ruminal, abomasal and duodenal cannulae. Polyethylene glycol (PEG) was injected into the rumen and abomasum to determine digesta flow. Simultaneous pharmacokinetic analysis of PEG concentrations in ruminal and abomasal fluids and prednisolone concentrations in plasma led to the development of a model containing both physiological parameters (digesta flow rate constants) and pharmacokinetic parameters (compartmental volumes and first-order rate constants of drug disposition). The biological half-life of prednisolone administered intravenously was 1.1 hours. The percentages of absorption of prednisolone introduced into the rumen, abomasum and duodenum were 6%, 20% and 19%, respectively. It appears that 78% of the dose in the rumen was destroyed by the ruminal contents, or otherwise rendered unavailable for absorption.