1155-92-596 **Dane Patey**, **Jennifer Forbey**, **Steve Kern** and **Rongsong Liu***, Dept. of Math. and Stat., University of Wyoming, Laramie, WY 82071. *Using pharmacokinetic models to predict bioavailability of toxins in vertebrate herbivores.*

In this project, compartmental pharmacokinetic models are built to predict the concentration of toxic phytochemical in the gastrointestinal tract and blood following oral intake by an individual vertebrate herbivore. The existing single and multiple dose pharmacokinetic models are extended by inclusion of impulsive differential equations which account for an excretion factor whereby unchanged toxins are excreted in the feces due to gastrointestinal mobility. An index α is defined to measure the fraction of bioavailability attributed to the excretion factor of gastrointestinal motility. Sensitivity analysis was conducted and suggests, for any toxin, the bioavailability index α depends mostly on absorption rate of toxin from gastrointestinal tract into the blood, frequency of elimination due to gastrointestinal motility, and the frequency of toxin intake, under the model assumptions. (Received January 21, 2020)