1137-60-98 **Xueying Wang***, Department of Mathematics and Statistics, Washington State University, Pullman, 99164, and **Pauline van den Driessche**. *Stochastic Models of Bovine Babesiosis With Juvenile Cattle.*

Bovine Babesiosis is a tick borne parasitic disease, which renders more than 1.3 billion bovines at potential risk of being infected worldwide. This work is devoted to stochastic models of Bovine Babesiosis, with a focus on the disease extinction and outbreak and probability distribution of the infectious adult bovine and that of infectious ticks. The stochastic models are a system of continuous time Markov chains derived based on the dynamics of deterministic ordinary differential equation models, i.e., Model J in Saad-Roy et al. (BMB, 2015) and Model Aranda et al. (Math Methods Appl Sci, 2012) (which is a special case of Model J). The multitype branching process approximation is used to estimate the probability of disease extinction/outbreak. Unlike the deterministic dynamics that indicate the basic reproduction number R_0 serves a sharp disease threshold (i.e., if R_0 is less than or equal to the unity, the disease dies out; if R_0 is above the unity, the disease is uniformly persist and becomes established, in Saad-Roy et al. (BMB, 2015)), our stochastic models indicate, more realistically, that there is always a positive probability that disease extinction within both cattle and tick populations. This is joint work with Pauline van den Driessche. (Received January 29, 2018)