

1145-34-2998

**Blessing Emerenini\*** (drblessing207@gmail.com), Department of Mathematics, Oregon State University, Corvallis, OR 97331. *Mathematical modeling and optimal control of Tick Fever.*

Presented in this work is a compartmental Mathematical model of the disease for the bird and Tick populations, this was analyzed using methods from dynamical systems theory. The disease steady state and the conditions for reaching a stable disease-free steady state were determined. The analysis by (Lyapunov method) showed both local and global stability. Further investigation involved the introduction of controls to the model; the existence and uniqueness of the optimal control were established. Finally, the effect of the controls were investigated using numerical simulations. (Received September 26, 2018)