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**James F Selgrade\*** ([selgrade@ncsu.edu](mailto:selgrade@ncsu.edu)), Box 8205, North Carolina State University, Raleigh, NC 27695. *Dynamics and Bifurcation in Models for Hormonal Regulation of the Menstrual Cycle.*

Systems of ordinary differential equations are presented which describe various aspects of hormonal regulation of the menstrual cycle of adult women. Differences in dynamical behavior occur depending on which hormones are included in the model and what data sets are used to estimate parameters. In some cases, bistability of periodic solutions may occur. We analyze the bifurcation diagrams with respect to sensitive parameters using XPPAUT. For example, two crucial model parameters are examined that modulate the effects of estradiol and of ovarian androgens on pituitary synthesis of luteinizing hormone, which is required for ovulation. We show that hysteresis may explain some model differences. Implications for hormonal regulation of the menstrual cycle are discussed. (Received January 28, 2015)