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Wolkowicz. *Global analysis of a simplified model of anaerobic digestion and a new model for the chemostat.*

A. Bornhöft, R. Hanke-Rauschenbach, and K. Sundmacher, Steady-state analysis of the anaerobic digestion model no.1 (ADM1), *Nonlinear Dyn.*, 73 (2013), pp. 535–549 introduced a qualitative simplification to the ADM1 model for anaerobic digestion. We obtain global results for this model by first analyzing the limiting system, a model of single species growth in the chemostat in which the response function is non-monotone and the species decay rate is included. Using a Lyapunov function argument and the theory of asymptotically autonomous Systems, we prove that even in the parameter regime where there is bistability, no periodic orbits exist and every solution converges to one of the equilibrium points. (Received September 24, 2018)