

Whole-farm nutrient budgets of organic dairy farms.

DH Lynch^{1*}, CJ Roberts², RP Voroney², RC Martin¹, SD Juurlink¹.

¹Department of Plant and Animal Sciences, Dalhousie University, Truro, NS (dlynch@dal.ca);

²Department of Land Resource Science, University of Guelph, Guelph, ON.

The sustainability of organic dairying in Canada, with respect to nutrients, remains unexamined. To assess how management affects nutrient status, we documented whole-farm nutrient (NPK) budgets over 2 yrs (2003 to 2005) and soil (0 to 15 cm) P and K status on 15 long-term Ontario organic dairy farms. Farm size, livestock density and herd productivity averaged 110 ha, 1.00 livestock units ha⁻¹ and 5656 kg milk cow⁻¹ yr⁻¹, respectively. Annual farm nutrient surpluses of 75 (N), 1 (P) and 11 (K) kg ha⁻¹ yr⁻¹ were lower than those reported for confinement-based dairy farms in the United States of America, pointing to possible environmental benefits from reduced off-farm impacts on air and water quality. Weighted average soil test P levels were low (approximately 50% of farms, whereas exchangeable K levels were moderate to high (76 to 160 mg kg⁻¹) on all farms. Four farms adopting a "self-sufficient" approach, producing most feed on-farm, imported little P as feed (1.37 to 1.90 kg P ha⁻¹ yr⁻¹) and had negative average farm P balances (avg. -1.54 kg P ha⁻¹ yr⁻¹). An integrated nutrient management approach, along with a flexible feed import strategy, fosters the sustainability of organic dairying systems.