Project Title: Life Cycle Analysis of the Production and Land Application of Anaerobically Digested Manure from Dairy Farms

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In Partnership With:

Agriculture and Agri-food Canada (AAFC), Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), Dairy Farmers of Canada, University of Ottawa, Thunder Bay Agricultural Research Station, Fepro Farms, Terryland Farms and Pinehedge Farm

Objectives:

1. Evaluate environmental and economic benefits of anaerobic digestion systems for medium sized livestock farms.
2. Evaluate enhanced biogas production through the addition of high organic agricultural and non-agricultural feedstocks.
3. Assess the fate of nutrients, GHGs and pathogens from the storage and land application of digested versus undigested manure and subsequent environmental and agronomic impacts.

Methodology:

- Three on-farm anaerobic digesters in Eastern Ontario are being evaluated. Monitoring parameters for digester samples include: temperature, pH, biogas production, CH_4, VS, COD, VFAs
- Land application trials are being conducted at:
  - Alfred: monitoring of soil and water after land application of raw manure, digested manure and inorganic fertilizer.
  - AAFC at Ottawa monitoring of soil and air after land application of raw manure, digested manure and inorganic fertilizer.
  - Thunder Bay Research Station: monitoring of soil and water after land application of raw manure, digested manure and inorganic fertilizer.

Monitoring parameters for Water & Soil samples include NH_4^+, NO_3^-, TP, *E.coli*, *Salmonella*, Enterococci, and C.*perfringens* and for Air samples include NH_3, CO_2, N_2O, CH_4.

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Community Benefits Include: Better environment, renewable energy