



Western Beef  
Development Centre

A Division of PAMI

## RUNOFF FROM WINTER IN FEEDING PASTURE SYSTEMS

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### Why be Concerned with Runoff?

- Jungnitsch (2008) documented increased nutrient returns with winterfeeding in pasture system increasing chance for runoff
- Fecal coliforms hazardous to human and animal health
- Nitrogen in runoff advances eutrophication
- Nitrate at levels of  $10 \text{ mg L}^{-1} \text{ NO}_3^{-1}\text{-N}$  or higher are a health hazard
- Phosphorus increases eutrophication

### Objectives

- Evaluation nutrient levels in soil pre- and post-winterfeeding for phosphorous and nitrogen.
- Analyze runoff for coliforms, nitrogen and phosphorus collected from:
  - Winterfeeding pasture study area
  - Control pasture study area
  - Traditional dry-lot in-yard study area
- Propose strategies to better utilize winterfeeding systems and mitigate nutrient effect.

### Hypotheses

- Elevated levels of phosphorus and nitrogen in runoff and soil post-winterfeeding.
- Runoff levels of coliforms, nitrogen and phosphorus will be higher from dry-lot in-yard system compared to in-pasture system.
- Winterfeeding in-pasture system will provide better utilization of nutrient returns in manure and feed with the least amount of environmentally harmful runoff compared to dry-lot.

### Approach

#### Treatment

- Stocking rate of 800 cows/day/acre in approximately seven-acre paddock
- 200 bales
- Electric fence moved every three days allowing more access to bales
- Portable windbreaks and hauled water

#### Sampling

- Runoff water in piezometer before and after treatment for coliforms, nitrogen and phosphorous
- Runoff collected in 4 basins in Treatment and Control
- Water collection of runoff from dry-lot
- Soil samples before and after treatment for: nitrogen, phosphorous, carbon, salinity, and pH
- Bales for nutrient levels