To Sample or Not?

Manure Characterization:
A Tri-Provincial Review of Manure Book Values

Manure Management Update
January 19, 2015
Lethbridge, AB

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Manure Characterization

Used in Manure Management Planning

- Manure application
- Manure storage design

Challenges

- Inconsistency between sources
- Conflict with industry data
- Missing data in sources
- Changes to production practices
  - Feed
  - Genetics
  - Production systems

Three ways to characterize manure

- Amount produced (MP)
- Nutrient production (NP)
- Nutrient concentration (NC)

- Given any two the third can be calculated with some assumptions

$$NP = MP * NC$$

Factors affecting data

Possible errors
- Storage loss assumptions
- Density assumptions
- Erroneous book values

Other factors
- Sampling protocol
- Feed regimes
- Use of pytase in liquid swine manure
- Moisture contents
- Environmental

Published Reference Data

Alberta Manure Characteristics and Land Base Code
Alberta Nutrient Management Planning Guide, 2007– Appendix 4A
Saskatchewan Workbook and Application Form, 1996 – Appendix A
Agricultural Operations Database, Saskatchewan
Manitoba Land Calculator, August 2014
Manitoba Farm Practices Guidelines for Pigs
Manitoba Manure Production Calculation Table
USDA Agricultural Waste Management Field Handbook, 2008
Tri-Provincial Manure Application and Use Guidelines
Manure Characteristics, MidWest Plan Service, 2004

Industry Data

Manure content forage project, Alberta
Southern region nutrient management project, Alberta
Manure Properties of Saskatchewan Feedlots, 2013
Swine production data , Saskatchewan industry
Sask - 5 broiler farms (preliminary and unpublished), 2013
Sask - 2 Layer farms (preliminary and unpublished), 2013
Calculating Manure Application Rates, Manitoba, 2009
Characterization of Solid Beef Manure, Manitoba, 2005
Characterizing laying hen manure properties, Manitoba
Lab information
Battersea project
A case study of dairy farms in Manitoba, 2012
Average swine manure nutrient concentration, Manitoba, Agra-Gold Consulting Ltd., 2013

Animal Types

Feedlot Cattle
Feeder Pigs – liquid manure
Weanling Pigs – liquid manure
Farrow to Finish Pigs – liquid manure
Farrow Sows – liquid Manure
Broiler Chickens
Layer Hens – solid manure
Turkeys
Dairy Cows – liquid manure
Dairy Cows – solid manure
Lambs

Book Value Comparison

Species/ Animal Type	Manure Production	NP Production		NP Concentration	
		Nitrogen	Phosphorus	Nitrogen	Phosphorus
Finisher Cattle					
Swine feeders					
Swine Weaners					
Farrow to Finish					
Farrow					
Chicken Broilers					
Chicken Layer					
Turkey Toms					
Dairy Liquid					
Dairy Solid					
Lamb					

Industry Value Comparison

Species/ Animal Type	Manure Production	NP Production		NP Concentration	
		Nitrogen	Phosphorus	Nitrogen	Phosphorus
Finisher Cattle					
Swine feeders					
Swine Weaners					
Farrow to Finish					
Farrow					
Chicken Broilers					
Chicken Layer					
Turkey Toms					
Dairy Liquid					
Dairy Solid					
Lamb					

Alberta Comparison

Species/ Animal Type	Manure Production	NP Production		NP Concentration	
		Nitrogen	Phosphorus	Nitrogen	Phosphorus
Finisher Cattle	LOW	LOW	LOW		
Swine feeders					
Swine Weaners	LOW	HIGH			
Farrow to Finish					
Farrow		HIGH	HIGH	LOW	
Chicken Broilers					
Chicken Layer		HIGH	HIGH	HIGH	HIGH
Turkey Toms	LOW	LOW		LOW	LOW
Dairy Liquid		HIGH		HIGH	HIGH
Dairy Solid	HIGH				
Lamb	HIGH	LOW			LOW

Learnings

1. Continue to **work at a tri-provincial level** to share information.

2. Where possible utilize **existing research** to help better **quantify manure characteristic** values from industry.

3. Ensure that **future work** regarding the collection of manure characteristic data **also documents other factors** that may influence values.

Acknowledgments

Manitoba Agriculture, Food and Rural Development

Gary Plohman
Mitchell Timmerman
Van Doan
Petra Loro
Clay Sawka

Saskatchewan Agriculture

Darren Stovin

Alberta Agriculture and Rural Development

Trevor Wallace
Karen Yakimishyn