

CAT LITTER and DOG FECES: COMPOST or WASTE?

Some Background

- Nova Scotia has set a solid waste disposal rate goal of 300 kg per person per year by 2015.
 - > 500 kg in 1997
 - 350 kg in 2000
 - ~ 500 kg in 2006
- Colchester County is the only Nova Scotia compost facility accepting CLDF for composting.
- An estimated 10,000 tonnes / year of CLDF could be diverted from landfills into compost (over 3% of the 2015 diversion goal).

QUANTITY OF CLDF GENERATED IN NOVA SCOTIA

2005 Victoria, BC Waste Composition Study:

Cat litter + animal feces = 10.0 kg / person / year

2002 Oregon State Waste Audit:

Cat litter + animal feces = 12.0 kg / person / year

11.0 kg x 940,000 Nova Scotians = ~10,000 tonnes / year
= ~10% of annual compost
= ~3% of diversion goal

Evaluation Parameters

- Sodium content
- Plant nutrient content
- Water holding capacity
- Pharmaceutical residues
- Pathogen issues

CAT LITTER: SODIUM CONTENT

- High sodium concentrations in compost restrict its use and can be phytotoxic.
- Twenty three cat litter samples were analyzed for acid soluble sodium.
 - 13 Clumping (bentonite)
 - 2 Conventional clay
 - 3 Silica crystals
 - 5 Biodegradable / compostable

Cat Litter Sodium Concentration Summary

13 Clumping (bentonite) = ≤ 0.015 - 0.50%
 2 Conventional clay = ≤ 0.015 - 0.03%
 3 Silica crystals = 0.05 - 0.11%
 5 Biodegradable = ≤ 0.015 - 0.28%
Mean Na Concentration = 0.15%

Reported Na compost concentrations
= 0.03 – 0.54%

CAT LITTER: PLANT NUTRIENT VALUE

<u>Nutrient</u>	Cat Litter(%)	Compost(%)
Phosphorous	$\leq 0.01 - 0.52$	0.14 - 0.59
Potassium	$\leq 0.015 - 0.54$	0.53 - 3.4
Calcium	0.02 - 13.11	2.0 - 11.4
Magnesium	$\leq 0.02 - 4.25$	0.26 - 0.66

Cat Feces = Dog Feces: N-P-K = 0.7-0.25-0.02

CAT LITTER: WATER HOLDING CAPACITY

Clay Litters	0.30 – 0.74 ml/g
Silica Litters	0.94 – 1.03 ml/g
Biodegradable	1.58 – 2.54 ml/g

Compost Water Holding Capacity = 0.88 – 2.43 ml/g

PHARMACEUTICAL RESIDUES in CLDF

- Concerns about pharmaceuticals in CLDF parallel those related to livestock manure and human biosolids as compost feedstocks.
- Majority of pharmaceuticals (~90%) are excreted unchanged in feces and urine.
- Fate of excreted pharmaceuticals in the environment recognized as threat to surface and ground waters.

Pharmaceuticals

- Veterinary drugs include a diverse array of chemical functional groups and exhibit variable chemical stabilities.
e.g. turkey manure compost: (reduction after 35 days)

■ Chlortetracycline	=	>99%
■ Tylosin	=	76%
■ Monesin	=	54%
■ Sulfanilamide	=	0%
- Published studies indicate compost reduces:
 - Explosives in soil
 - Hydrocarbons
 - Personal care products
 - Hormones

CLDF: PATHOGEN ISSUES

- Parasites in cat and dog feces:
 - Enteric bacteria (*E. coli*, *Salmonella*)
 - Protozoa (*Toxoplasma*, *Giardia*)
 - Helminth worm
- Pathogens or their spores, eggs or cysts can persist for years in soil
- Thermal pathogen control:
 - In-vessel: 55C for 3 days
 - Windrow: 55C for 15 days with 5 turnings
- Indicator organisms serve as proxies for all pathogens in compost:
 - Fecal coliform bacteria < 1000 / g
 - *Salmonellae* < 3 / 4g

Pathogens

- Reports are found indicating survival of each major class of pathogen in composts achieving required 55C for the required time.
- Major concerns involve cool zones and more rigorous temperature monitoring.
- More research required on thermal deactivation of specific pathogens.
- CLDF pathogen issues are identical to those related to livestock manure and human biosolid composts.
- Risk of direct exposure to pathogens in untreated CLDF by pet owners is much greater than pathogen exposure risk to the public handling composts with diluted CLDF after thermophilic processing.

Summary

- Sodium concentrations in cat litter are similar to those commonly found in good quality composts.
- Cat litters contain modest amounts of the plant nutrients P,K,Ca and Mg.
- Cat litters have water holding capacities similar to composts.
- Issues related to pharmaceutical residues in CLDF are identical to those in livestock manure and human biosolids. Thermal composting generally reduces or eliminates these substances.
- Thermophilic compost conditions will reduce or eliminate pathogens in CLDF, livestock manure and biosolid composts.
- There are no compelling physical, chemical or biological reasons to not compost cat litter and dog feces. Diverting this material from landfill disposal to composting is recommended.