

## Why consider manure composting?

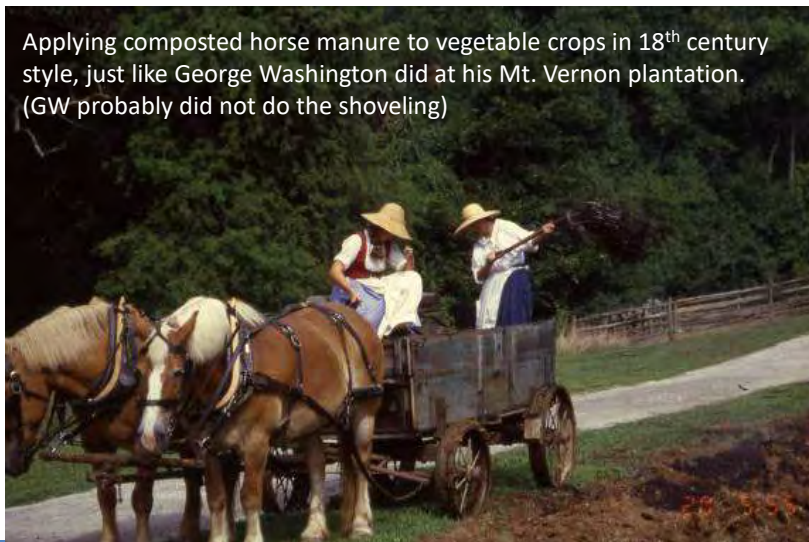
Prof Robert Rynk

Professor Emeritus, State University of New York,  
Cobleskill College of Agriculture and Technology

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## Composting manure *It ain't bloody new mate!*

Applying composted horse manure to vegetable crops in 18<sup>th</sup> century style, just like George Washington did at his Mt. Vernon plantation. (GW probably did not do the shoveling)



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## Functions and Utility

### **Composting manure:**

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- Reduces its volume, weight and moisture
- Makes it easier to handle, less sticky and icky
- Makes it “storable” without odor and further loss of N and methane
- Makes it easier to spread and less odorous
- Greatly reduces the loss of N after land application

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## The Flip Side

### **Composting manure:**

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- Takes time, equipment, land and labor
- Can generate odors in itself
- Possibly leads to N loss in itself
- Requires the addition of dry low N amendments, if done correctly
- Often morphs into a distinct and separate enterprise
- Might add to your regulatory burden

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## So ... Why compost manure?

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1. Because you have no choice, or little choice
2. Because you can save money
3. Because you can make money
4. Because you want to reduce your environmental impact

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## Why compost manure?

### 1. Because you have little choice

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- Not enough cropland of your own
- Your cropland (or your neighbor's) is saturated with nutrients (P or N)
- Neighboring farmers won't accept raw manure

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Why compost manure?

## 1. Because you have little choice

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- Spreading raw manure is problematic (odors, manure spills, etc.)
- Rules require impractical waiting period for harvesting after raw manure application
- Can't spread manure on frozen ground (*whaat?! This Australia, Yank*).

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Why compost manure?

## 2. Because you can save money

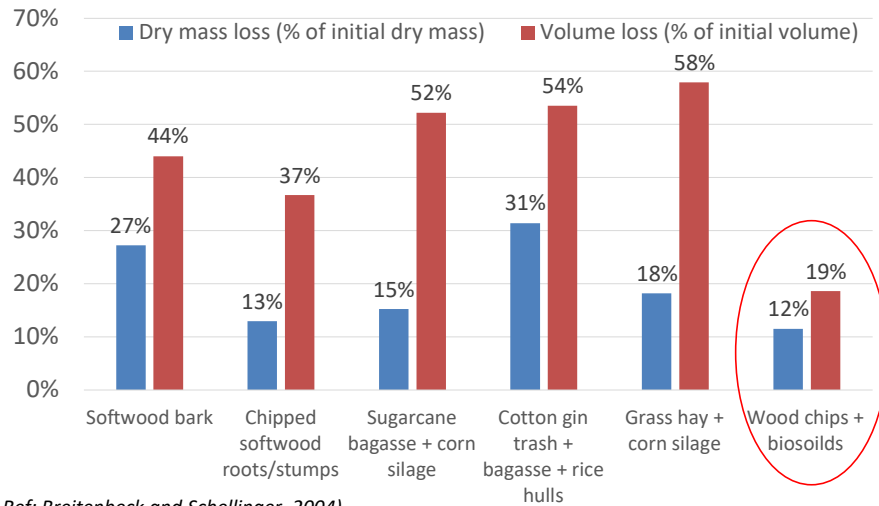
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- Less handling ... maybe
- Lower transportation costs to fields/farms
- Fewer weeds and/or lower herbicide costs
- Recover pasteurized bedding
- Reduce nitrogen immobilization and save fertilizer (or improve crop)
- Generate useable energy

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## 2. Because you can save money

$$\text{Volume Loss} = 0.8 - (2 \times \text{initial dry bulk density})$$



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## Why compost manure?

### 2. Because you can save money



Reduced  
handling and  
transport

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Why compost manure?

## 2. Because you can save money



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Why compost manure?

## 2. Because you can save money

Composting lowers the C:N ratio of heavily-bedded manure and litter.

Prevents N-immobilization.



Photo source: [https://www.pig333.com/company\\_news/new-system-permits-pigs-on-straw\\_14320/](https://www.pig333.com/company_news/new-system-permits-pigs-on-straw_14320/)

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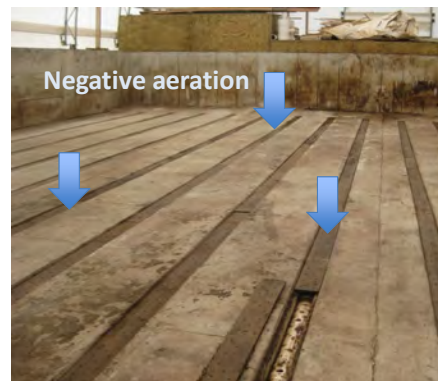
Why compost manure?

## 2. Because you can save money

### Aerated Static Piles with heat recovery

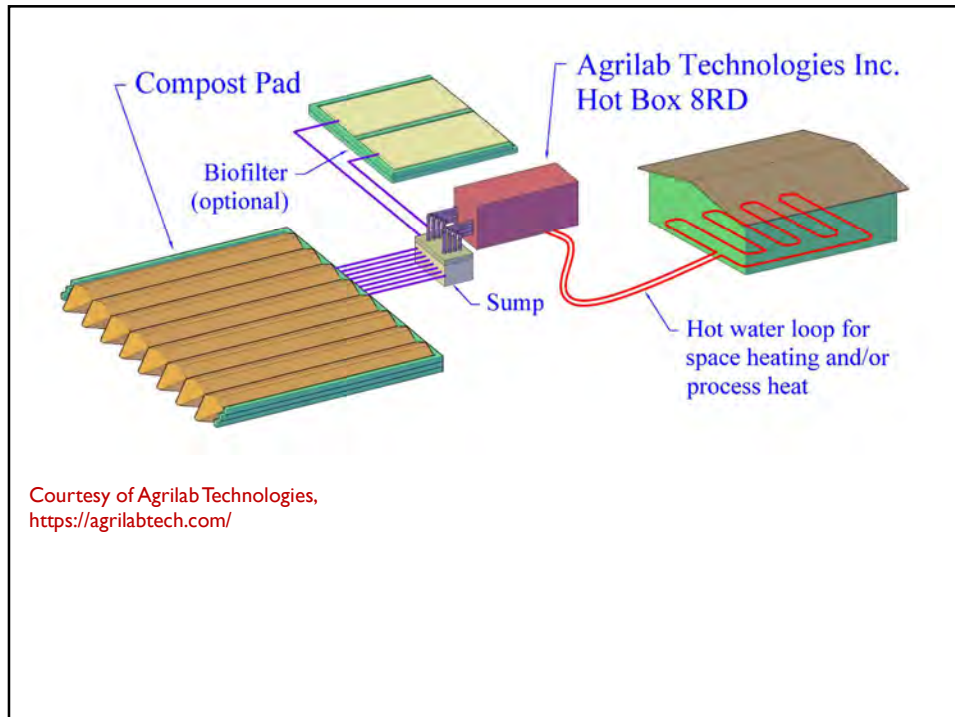


Conventional camera



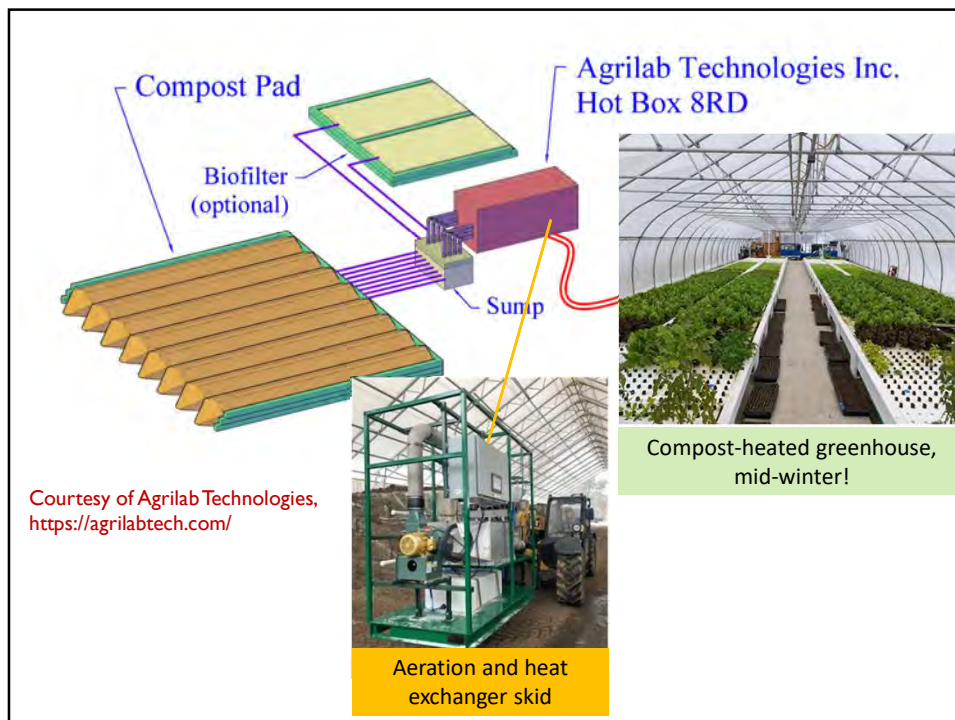
X-ray camera

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Courtesy of Agrilab Technologies,  
<https://agrilabtech.com/>

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Why compost manure?

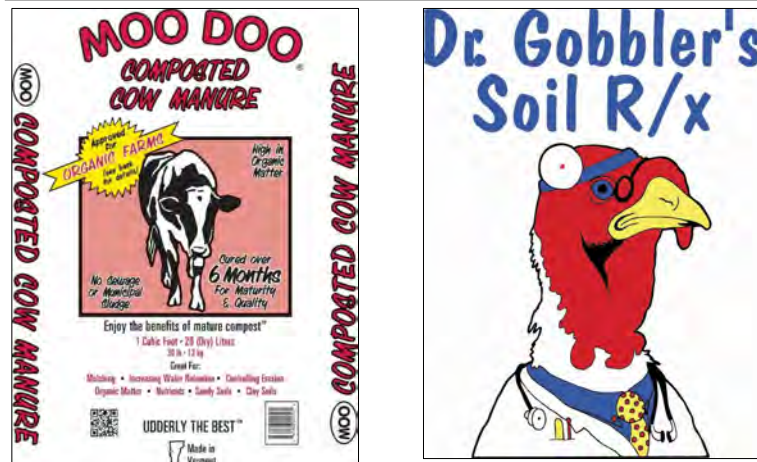
### 3. Because you can make money

- Sell compost made from your manure +
- Compost your manure with off-farm feedstocks for a fee
  - Community generated green waste
  - Food processing wastes
  - Grocery wastes (produce, bakery, cardboard)
  - Some organic industrial waste (e.g. non-recyclable paper)

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Why compost manure?

### 3. Because you can make money



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### 3. Because you can make money



Dairy cattle manure & food processing

Yard trimmings & horse manure

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Why compost manure?

**4. Because you want to reduce your environmental impact**

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Why compost manure?

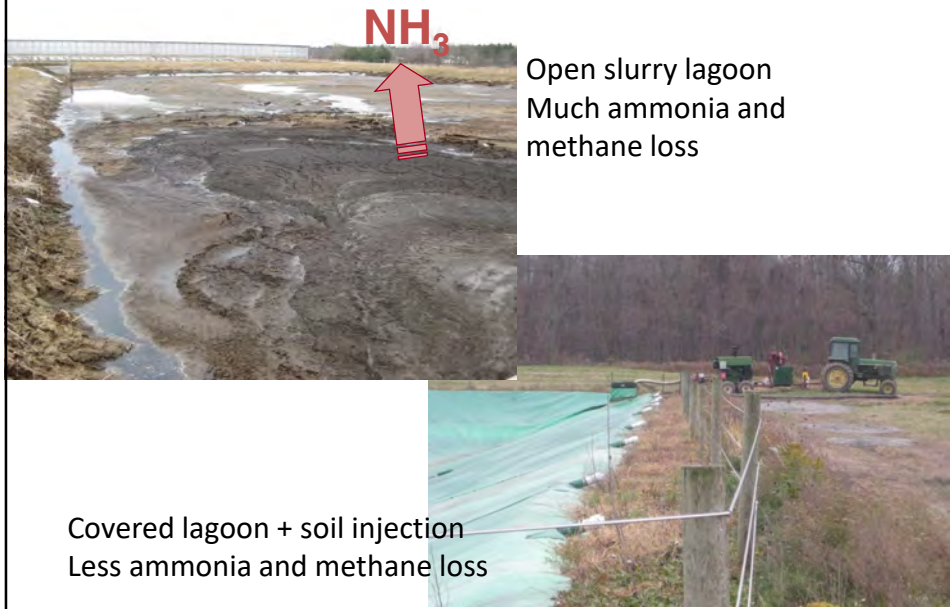
**4. Because you want to reduce your environmental impact**

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- Reduced air emission of ammonia ... *it depends*
- Reduced air emission of greenhouses gases ... *it depends*
- Less nutrient loss after field application
- Less water pollution from land-applied manure
- Carbon sequestration? ... The jury's still out

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Reduced air emission of ammonia ... *it depends*



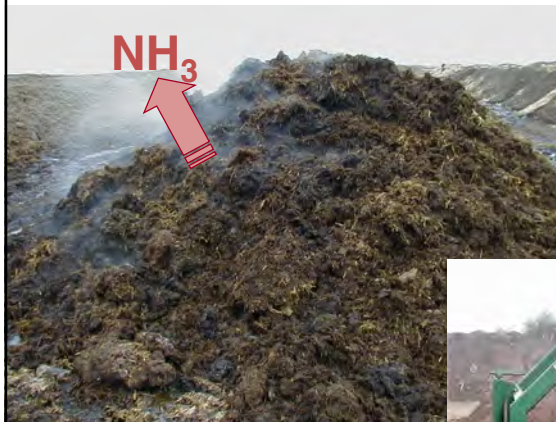
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*Some manure from this farm is in fact composted*



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## Reduced air emission of ammonia ... *it depends*



Little bedding low C:N,  
more ammonia loss



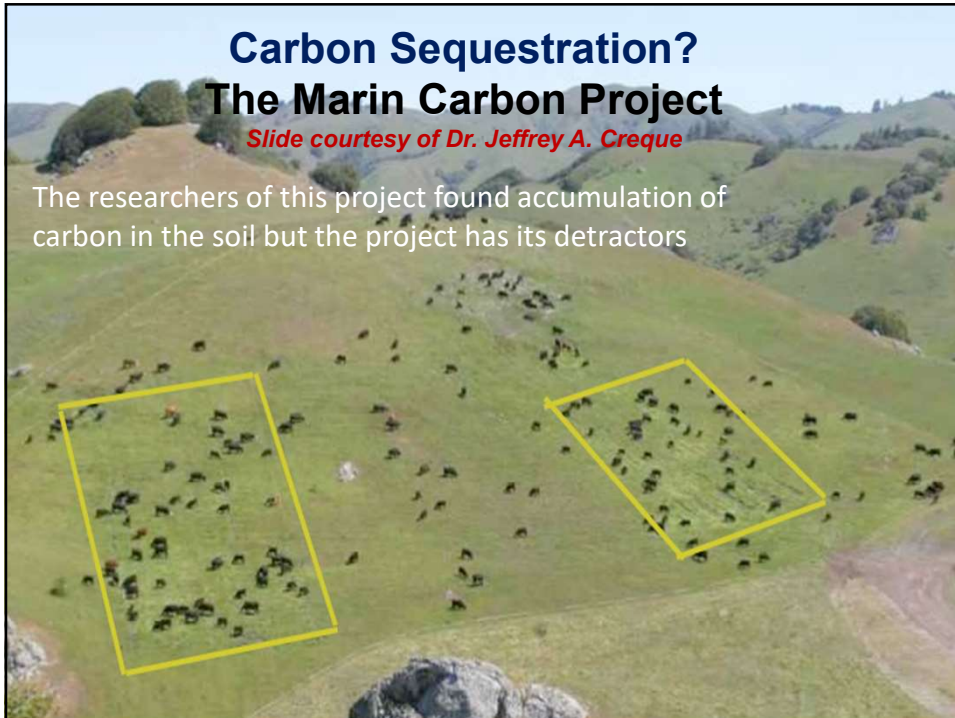
Abundant bedding moderate  
C:N, little ammonia loss

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## Carbon Sequestration? The Marin Carbon Project

*Slide courtesy of Dr. Jeffrey A. Creque*

The researchers of this project found accumulation of carbon in the soil but the project has its detractors



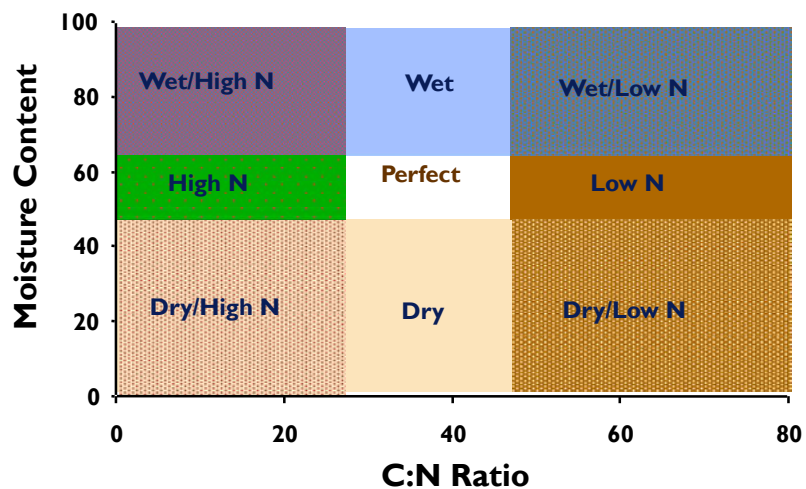
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## Manure as a composting feedstock

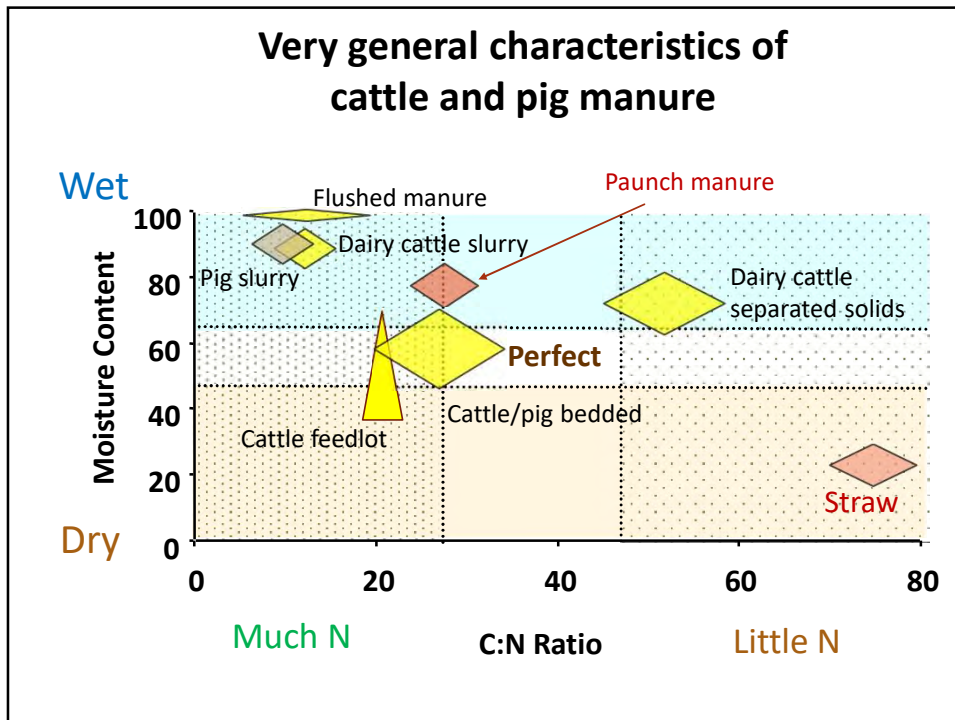
- Highly variable, as a general category
- Depends on animal species, type of housing, bedding, season, collection method, storage, etc.
- Can be sopping wet or powdery dry
- More often wet and high N. Needs dry low-N amendment unless well-bedded or littered
- It will be your main feedstock, probably
- Contains weed seeds

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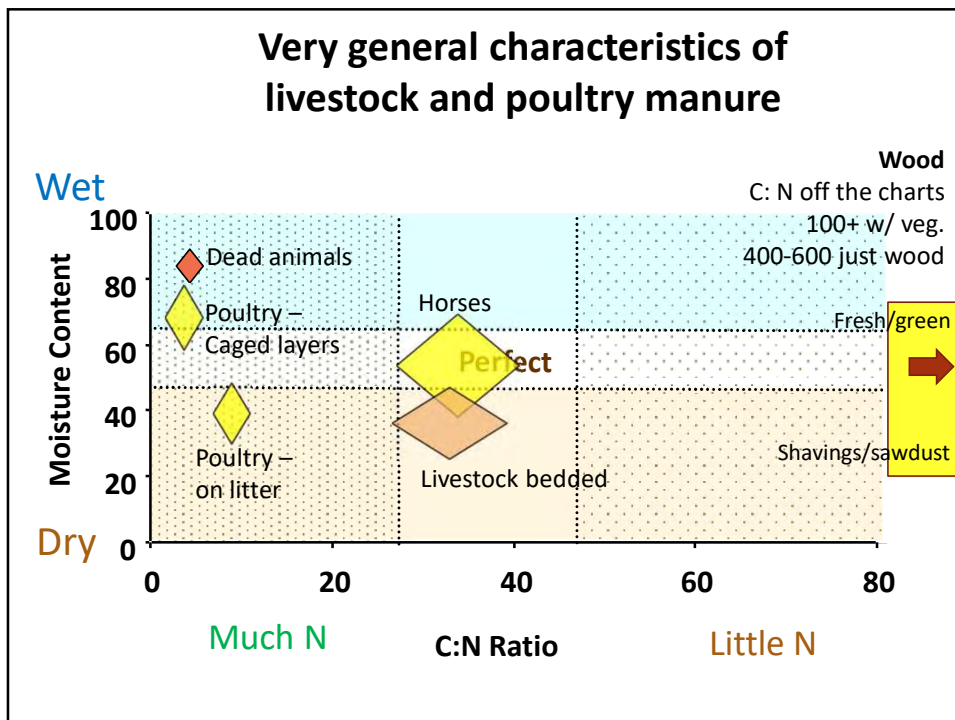
### Key Feedstock Composting Characteristics Moisture & C:N Ratio



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## In Summary

### Composting manure:

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- Reduces its volume, weight and moisture
- Makes it easier to handle, less sticky and icky
- Makes it “storable” without odour and further loss of N and methane
- Makes it easier to spread and less odourous
- Greatly reduces the loss of N after land application
- Pasteurizes it and destroys its weed seeds
- Makes it more stable
- Makes it exportable for longer distances and to more users beyond the farm
- Adds value to it and produces a saleable product
- Creates opportunities to earn revenue from composting off-farm wastes