




Digesters and Swine Manure Treatment

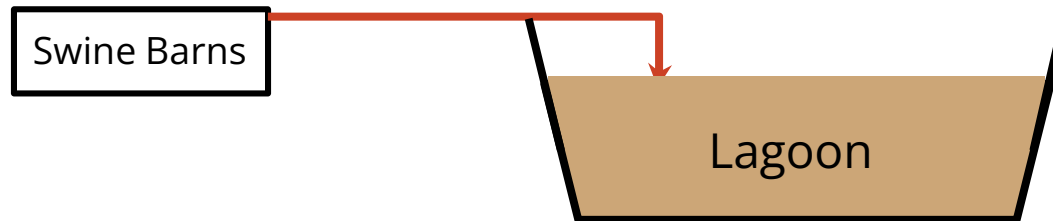
John Classen, PhD
October 12, 2021



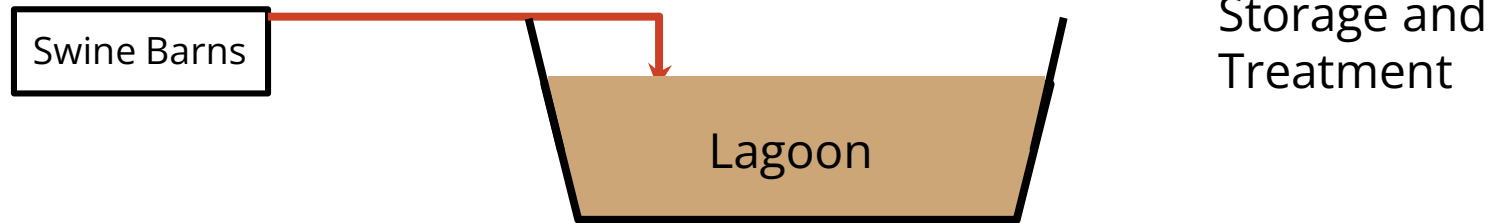
Digesters are similar to lagoons - but different



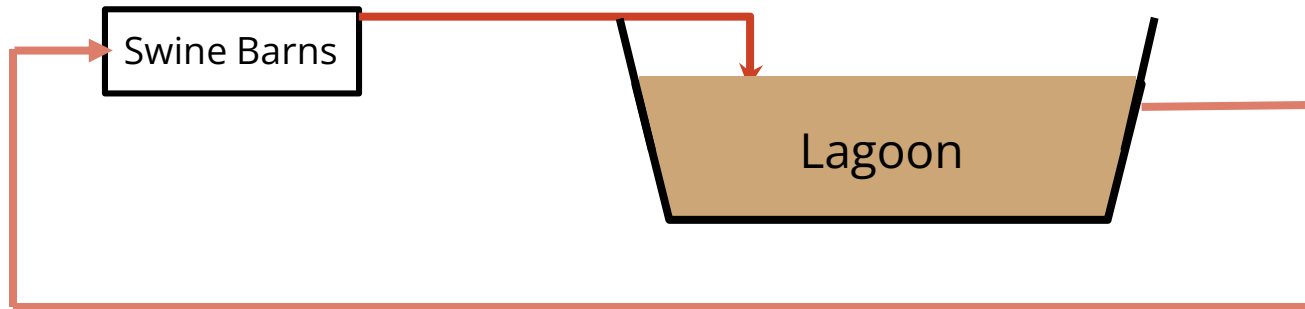
Process - Lagoons



Process - Lagoons



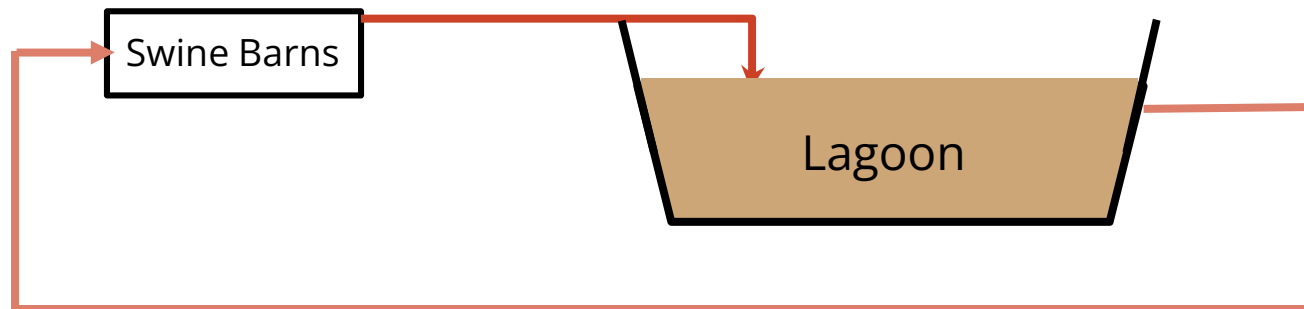
Process - Lagoons



Process - Lagoons

Conditions:

- Unmixed
- Low DO at surface
- Anaerobic at deeper levels



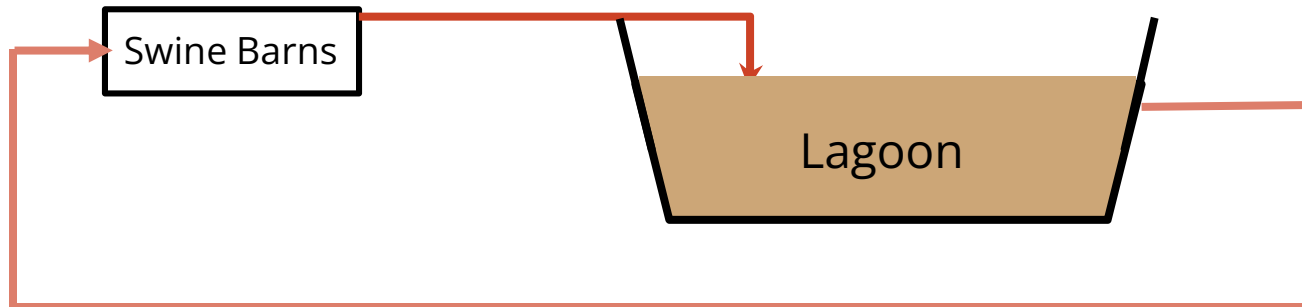
Process - Lagoons

Conditions:

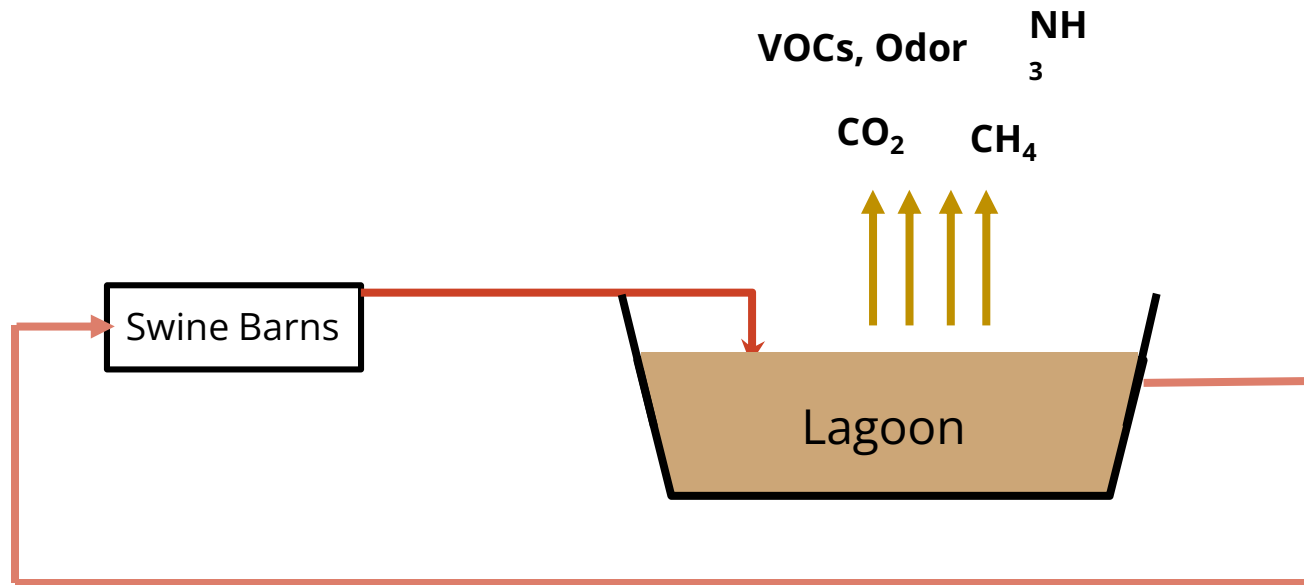
- Unmixed
- Low DO at surface
- Anaerobic at deeper levels

Leads to

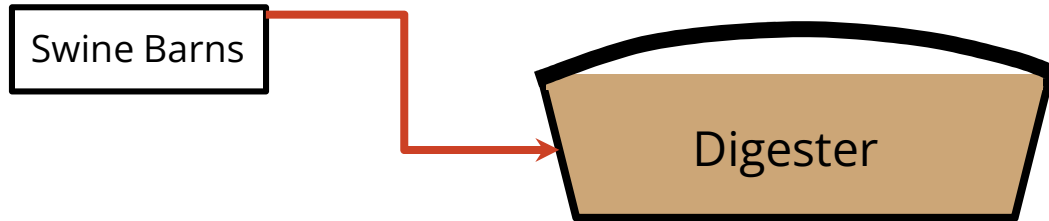
- Incomplete breakdown
- Low conversion to methane
- Residual organics and polymers



Process - Lagoons



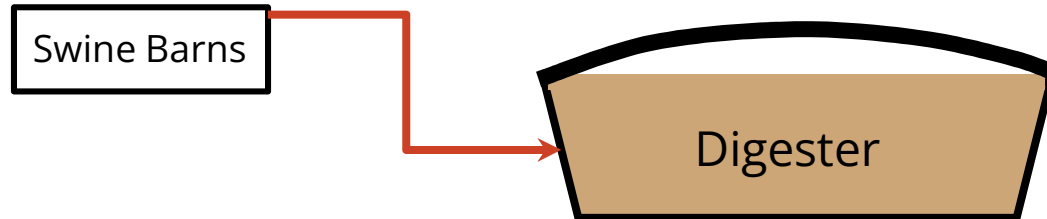
Process - Digesters



Process - Digesters

Conditions:

- No oxygen, fully anaerobic
- Mixed



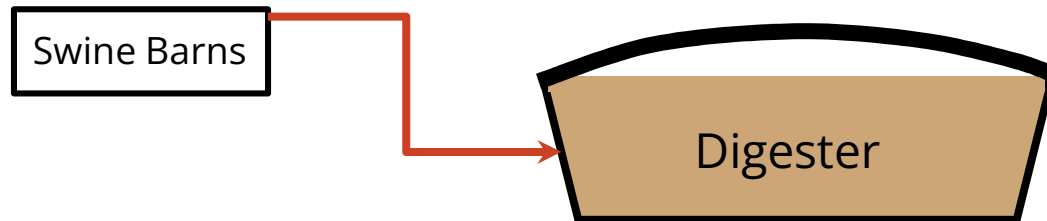
Process - Digesters

Conditions:

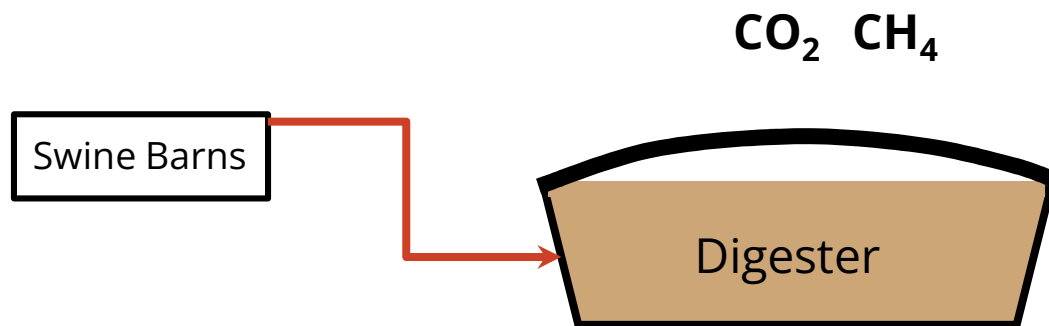
- No oxygen, fully anaerobic
- Mixed

Leads to

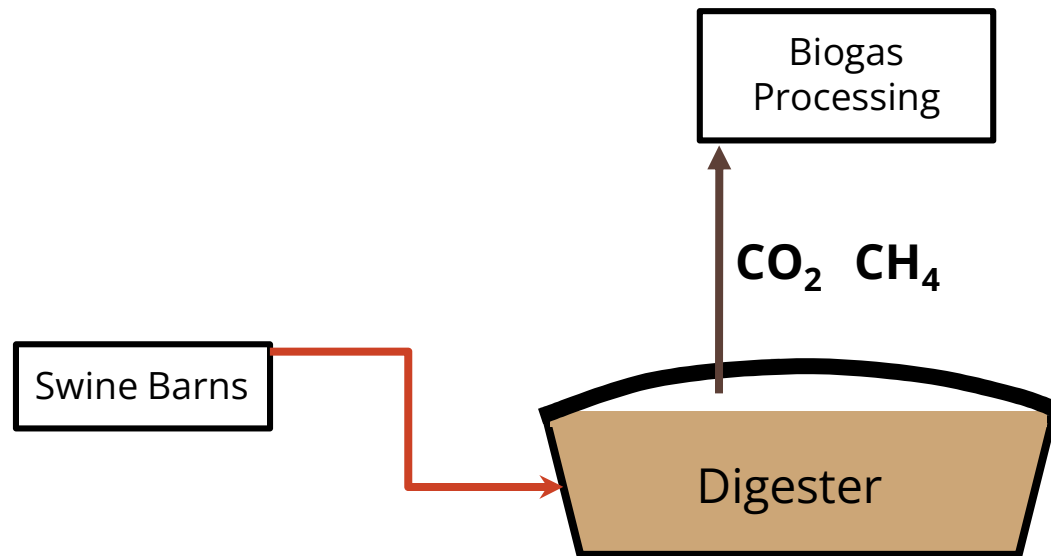
- More complete breakdown
- Higher conversion to methane



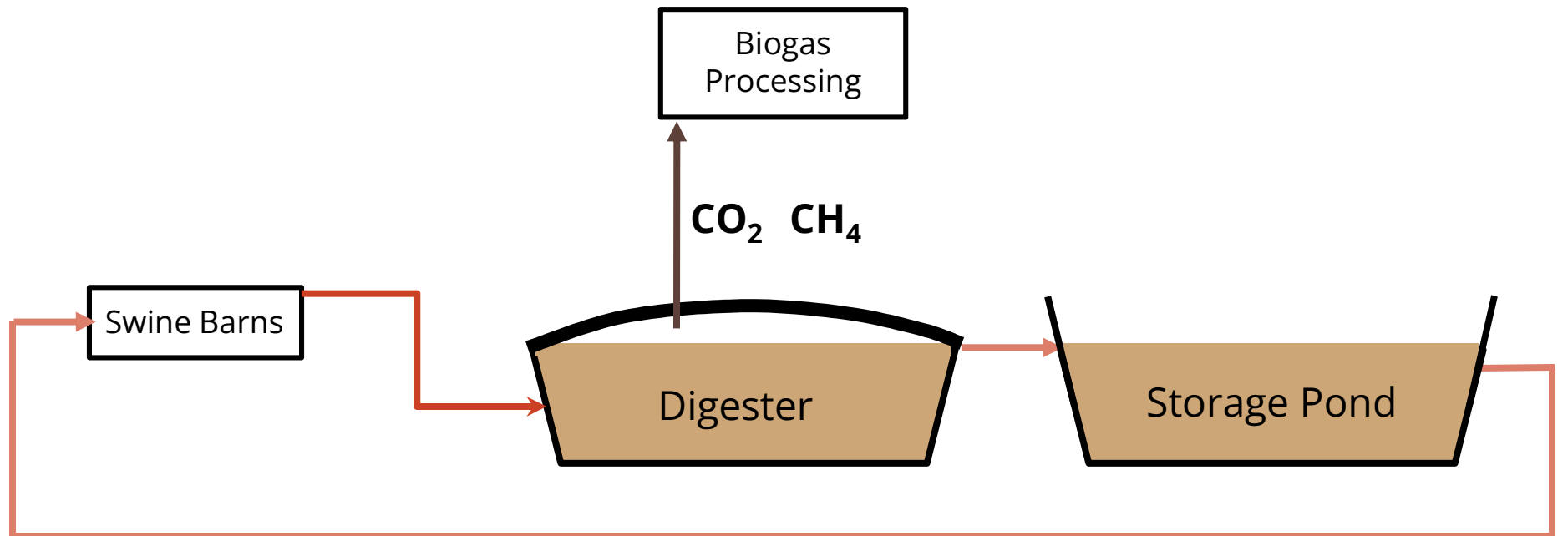
Process - Digesters



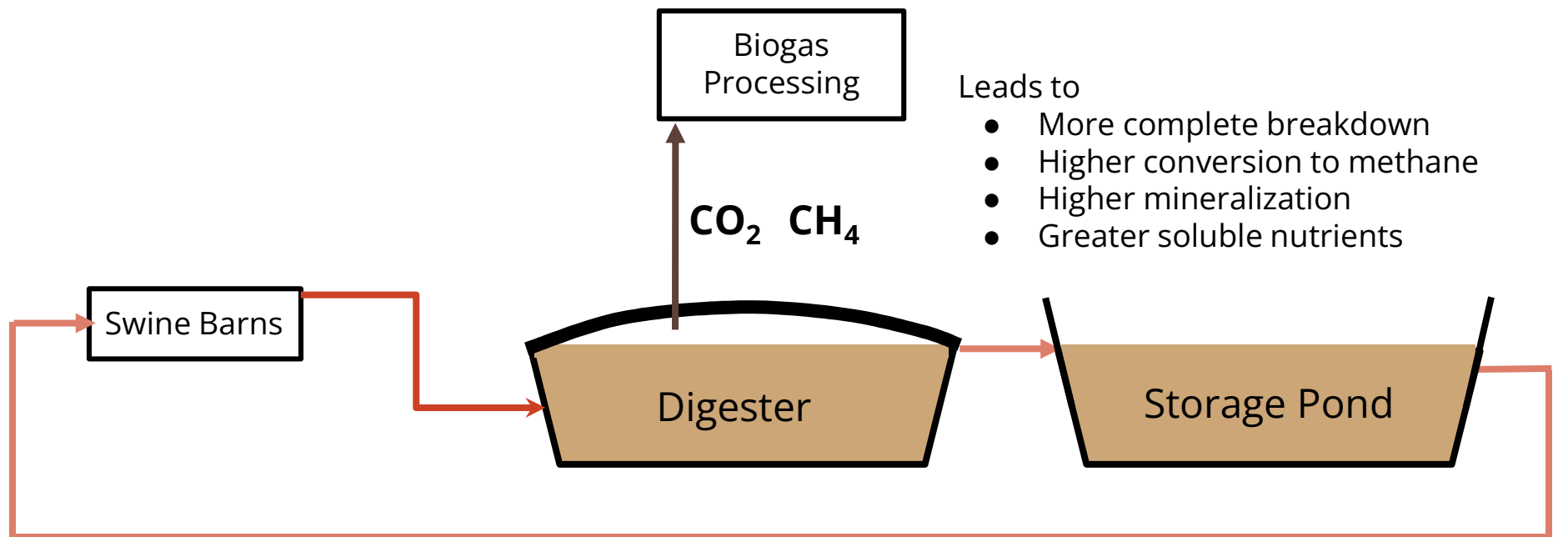
Process - Digesters



Process - Digesters



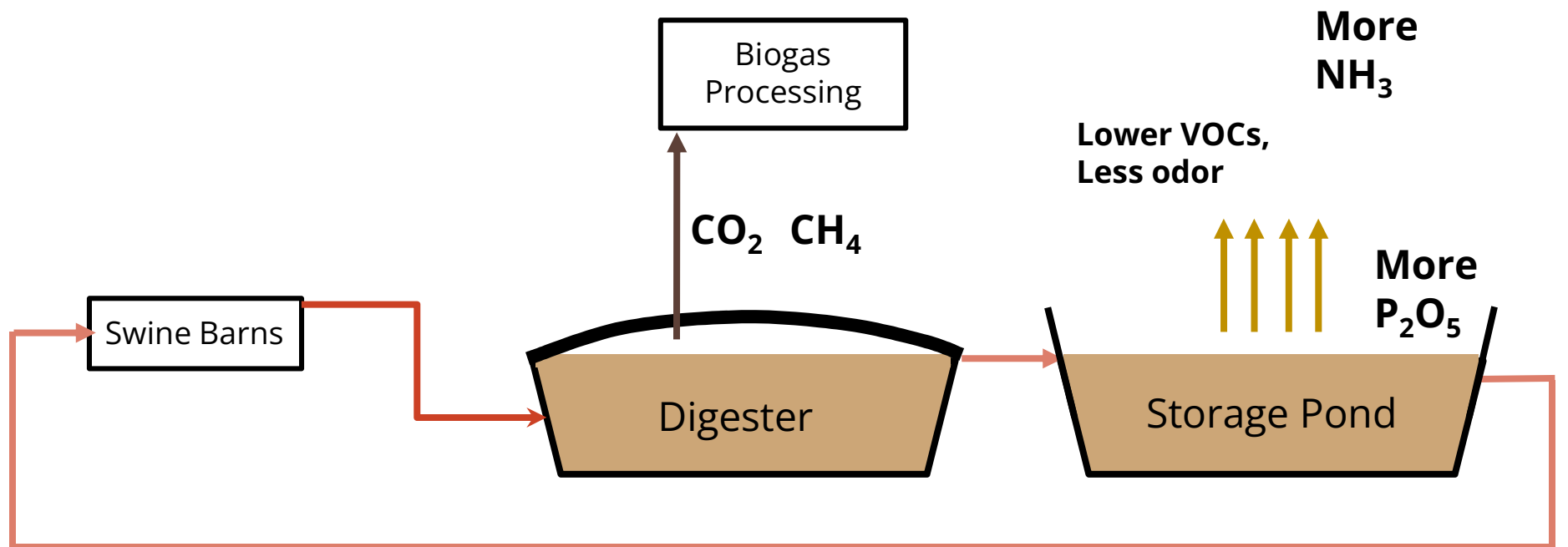
Process - Digesters



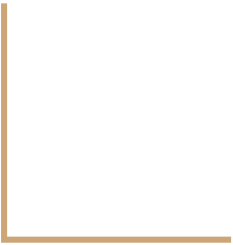
Leads to

- More complete breakdown
- Higher conversion to methane
- Higher mineralization
- Greater soluble nutrients

Process - Digesters



Questions





John Classen, PhD
Biological and Agricultural Engineering
NC State University
classen@ncsu.edu

