**GREENHOUSE GAS PRODUCED**
(*per 1000 kg of meat and meat by-products processed)

**END USES**
- Regulated to ensure safety of employees, the public, & the environment by STATES & the FDA, EPA, & USDA
- Establishing Industrial Process operating under and controlled by a CODE OF PRACTICE in line with federal regulations to control pathogens & ensure animal food safety
- 45-75% of the carbon in meat by-products is released as CO₂, and 4-20% is released as methane (with 25x the global warming potential of CO₂)

**ENVIRONMENTAL SUSTAINABILITY**
- Although fossil fuel can be required to produce steam for heating, many renderers use their fat products to fuel boilers, increasing energy independence.
- Nearly all CARBON IS RETAINED within rendered products and reused rather than becoming GHG
- Recovered resources have a HIGH ECONOMIC VALUE
- Recovered resources have relatively LITTLE ECONOMIC VALUE if digestate slurry is stored in open tanks

**BIOSECURITY & REGULATION**
- To destroy pathogens requires STRICT TIME & TEMPERATURE CONTROL without this control, pathogens and environmental problems increase DRastically
- REGULATIONS on composting & anaerobic digestion vary from state to state, NO CONSISTENT FEDERAL REGULATIONS on air emissions or wastewater.
- SEEPAGE CAN HARM people, animals, and plants

**RENDERING: THE GREENEST OPTION**
A Comparison Of 3 Alternatives For Large Scale Processing of Meat and Meat By-Products

**RENDERING**
- 200 kg GHG*
- Converts 99% of meat & meat by-products into ingredients for animal feed, biofuel, fertilizer, industrial and consumer products
- Recovered resources have a HIGH ECONOMIC VALUE
- 99%
- 49%

**INDUSTRIAL COMPOSTING**
- 2500–4000 kg GHG*
- Small fraction of meat and meat by-products can be recovered as fertilizer
- DIFFICULT to destroy pathogens
- Requires training and labor
- Low energy requirements but, 45–75% of the carbon in meat by-products is released as CO₂, and 4–20% is released as methane (with 25x the global warming potential of CO₂)

**ANAEROBIC DIGESTION**
- 60–500 kg GHG*
- Recovered resources have relatively LITTLE ECONOMIC VALUE
- Methane fuel gas, fertilizer
- To destroy pathogens requires STRICT TIME & TEMPERATURE CONTROL without this control, pathogens and environmental problems increase DRastically
- Regulations on composting & anaerobic digestion vary from state to state, NO CONSISTENT FEDERAL REGULATIONS on air emissions or wastewater.
- Seepage can harm people, animals, and plants

**Citation:** Gooding, C. and D. Meeker. 2016. Review: Comparison of 3 alternatives for large-scale processing of animal carcasses and meat by-products. Prof. Ani. Sci. (Vol. 32, Issue 3, p259–270)
Food Recovery Hierarchy
www.epa.gov/foodrecoverychallenge

Source Reduction
Reduce the volume of surplus food generated

Feed Hungry People
Donate extra food to food banks, soup kitchens and shelters

Feed Animals
Divert food scraps to animal feed

Industrial Uses
Provide waste oils for rendering and fuel conversion and food scraps for digestion to recover energy

Composting
Create a nutrient-rich soil amendment

Landfill/Incineration
Last resort to disposal

Rendering

Anaerobic Digestion

Industrial Composting

NATIONAL RENDERERS ASSOCIATION
FOR MORE INFORMATION:
National Renderers Association
500 Montgomery St, Suite 310, Alexandria, VA 22314 • (703) 683-0155 • info@nationalrenderers.com

www.nationalrenderers.org