

Evaluation of Carcass Treatment Methods



Any carcass or necropsy treatment system should **adhere to these core principles**. On the next page we will compare the methods:

1

Achieve Destruction & Sterilization

Utilize temperature, pressure, and agitation to breakdown material, while ensuring that sterilization is achieved throughout the entirety of the material.

2

Operate Efficiently in a Closed System

Contain all material within the contents of the processing vessel - no circulation outside or processing through multiple systems. Efficiently utilize resources, including natural gas, water, and electricity. Prevent particles from escaping the facility.

3

Limit Material Handling Post-Treatment

Once material is processed and treated, the material handling should be minimal or non-existent, and should not require additional processing or treatment elsewhere.

4

Ease of Validation

Validation of the system should be able to be done through proven methods, such as the placement of bio-indicators within the material prior to treatment.



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When **sterilization and disposal** is the goal, here's what we see operators doing with their pathogenic biowaste tissue:



Composting: making a heap of wet organic matter and waiting for the materials to break down over time. The process is aided by shredding, and ensuring proper aeration by regularly turning the mixture. Worms and fungi break up the material.

- *Composting is not a viable option for pathogenic waste.*



Renderers: an apparatus which is used to process animal tissue into more useful materials, typically for purified fats like lard or grease. The rendering process simultaneously dries the material and separates the fat from the bone and protein. Byproducts are then collected and incinerated.



Incineration: a gas-powered furnace, typically used and designed for industrial waste, which burns at very high temperature, reducing its contents to ash. Ash is then collected and disposed of as municipal waste.



USED BY PRI CAUSTIC DIGESTER UNIT (CDU) & OTHER DIGESTER BRANDS

Alkaline Hydrolysis (Gen 2): tissue is placed in a vessel that is then filled with a mixture of water and lye, and heated to a temperature around 150 °C (320 °F), at a high pressure. Tissue is broken down, and bones are collected while liquid is disposed of as sanitary municipal waste.



PATENTED, USED EXCLUSIVELY BY PRI THERMAL TISSUE DIGESTER (TTD)

Thermal & Physical Degradation (Gen 3): a revolutionary advancement in tissue disposal and sterilization, using agitation and heat to break down tissue (with or without alkali), minimizing water and caustic use in the process. Tissue and bones are broken down and disposed of as liquid through sanitary sewer or collected as dry discharge for municipal waste.

+ PRO's

- + low acquisition cost

- + can treat prions
- + sterilizes material
- + small footprint

- + can treat prions
- + sterilizes material
- + small footprint
- + low equipment cost

- + can treat prions
- + sterilizes material
- + small footprint
- + low operating cost
- + flexible discharge
- + mechanical agitation
- + easily validatable
- + no bone collection

- CON's

- no sterilization
- can't treat prions
- liability
- large footprint

- equipment purchase
- low level sterilization
- can't treat prions
- high odor
- large footprint
- transportation risk

- equipment purchase
- difficult regulations
- public protest
- costly utility usage
- no agitation
- carbon emissions

- equipment purchase
- bone collection
- chemical costs

- equipment purchase

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Comprehensive
Chart On Next Page



Evaluation of Carcass Treatment Options



When choosing a treatment system, many attributes must be taken into consideration, including the **efficacy of the process**, the **various costs**, and **any risks** associated with it.



CAUSTIC DIGESTER UNIT (CDU)



THERMAL TISSUE DIGESTER (TTD)

System Attributes:	Renderer	Incinerator (onsite)	Alkaline Hydrolysis (Gen 2)	Thermal & Physical Degradation (Gen 3)
Operating Temperature	121 - 135 °C	> 800 °C	135 - 150 °C	135 - 150 °C
Mechanical Maceration	✓			✓
Protein Hydrolysis/Destruction		✓	✓	✓
Prion Treatment Compliant		✓	✓	✓
Liquid Discharge			✓	✓
Solid Discharge	✓	✓	✓	✓
All Material Discharged (none leftover)	✓			✓
Load from Containment	✓	✓	✓	✓
Load Whole Carcass		✓	✓	✓
Equipment Acquisition Cost	\$\$	\$\$	\$\$\$	\$\$\$
Operating/Utility Cost	\$\$\$	\$\$\$\$	\$	\$
Biosafety Risk Validation Concerns	✓	✓		
Associated Guideline		✓	✓	✓
Associated Regulation		✓	✓	✓