



### Tissue Digestion Through RNA Alkaline Hydrolysis

Gyver's tissue digesters use RNA alkaline hydrolysis to properly dispose of animal lab waste, and completely destroy prions and other pathogens. RNA alkaline hydrolysis uses heat (150 degrees Celsius), pressure (4.14 bars), time, and an alkali catalyst (e.g., sodium or potassium hydroxide) to hydrolyze biological tissue into small peptides, proteins, sugars, and soaps. The end product, or "effluent," is a sterile, coffee-colored alkaline solution that is nutrient rich and can be used as compost or in other environmentally friendly applications.

#### Results

Prions are among the blood pathogens present in animal laboratory and learning center settings. A prion starts as a healthy PrP protein responsible for long-term memory and bone marrow renewal, but becomes altered by an infectious process, as with a mad cow prion. These blood pathogens cause a variety of diseases in humans and other mammals, including the following:

- Creutzfeldt-Jakob Disease, a degenerative neurological disorder in humans
- Bovine Spongiform Encephalopathy, also known as "mad cow disease"
- Kuru, a degenerative neurological disorder in humans
- Gerstmann-Straussler-Scheinker Disease, a rare neurodegenerative disease in humans
- Fatal Familial Insomnia, a very rare disease of the brain
- Scrapie, a degenerative disease that affects the nervous system of sheep and goats
- Chronic Wasting Disease, found in antlered herds

These diseases, which cause brain damage and eventually death, are recognized for having long incubation periods, but rapid progression once symptoms (including convulsions, dementia, and behavioral changes) appear. Unfortunately, all known prion diseases are untreatable.

Gyver's Renuvus D animal waste digesters offer a proven method for destroying prions with a system that is capable of accurately and consistently reaching 302 degrees Fahrenheit (150 degrees Celsius), pressure over 400 kPa, and contact with chemicals for six hours before the dehydration process.

#### Benefits

There are many benefits of RNA alkaline hydrolysis versus other types of disposal. Compared to incinerators, tissue digesters are more likely to meet municipal codes, have lower operating costs, and reliably reach temperatures necessary to achieve the desired results. Compared to transporting to landfill sites, tissue digesters are more convenient, and offer more reliable destruction of prions and other pathogens. Compared to autoclaves, tissue digesters can handle a larger waste volume and more reliable prion destruction.

Digesters that use RNA alkaline hydrolysis offer an environmentally-friendly, non-burn disposal method, and sterilization and digestion are completed in one relatively quick step. And, as already mentioned, this method provides complete prion destruction and a source for composting or anaerobic digestion. In addition, the portable digestion units that have recently been developed increase the potential applications for this technology.



## Handle With Care

While it has many benefits, the RNA alkaline hydrolysis process must be treated with caution. The tissue digester operates with extremely caustic sodium or potassium hydroxide and high heat and pressure. The discharged effluent must always be allowed to cool before it is handled to prevent any burn-related injuries. Personal protective equipment such as eye protection, face shields, coveralls, and rubber gloves should be worn when handling the sodium or potassium hydroxide, and when handling the discharged effluent while it is still hot, if necessary.

## Gyver's Tissue Digesters

The Renatus (meaning "rebirth") D animal waste digester line is built from the highest quality materials and is available in a variety of sizes, to meet the dead animal disposal needs of various facilities. The smaller lab models are built to accommodate between 80 and 500 lbs. of biomaterial at one time, and we can build units capable of handling up to 10,000 lbs. Every unit can be customized to meet each customer's needs.

The Renatus D units use the RNA alkaline hydrolysis process to decompose animal waste overnight. The stainless steel units are self cleaning and require little maintenance. Installation of each unit includes customized training and a customized DVD for later reference. All our machines are guaranteed, and we offer maintenance and support packages for our machines and others, as well as a full one-year warranty on labor and parts.

**To learn more about Gyver Industries,**  
please visit [www.gyverindustries.com](http://www.gyverindustries.com), or call (970) 567-7249 or (970) 568-4220.