



**Water & Waste Management**

**BG Max™ 3000**

**Food & Beverage**

Case study: Increase in biogas and power generation in a slaughterhouse anaerobic digester

**Rethink Tomorrow**

**novozymes®** 

A slaughterhouse significantly improved the operation and biogas production of its waste sludge anaerobic digester with the usage of BG Max™ 3000.

## Benefits

- **29% increase in overall biogas production**
- **51% increase in electrical power generation**
- **Significant cost savings associated with increased feed efficiency**

## Background

The swine slaughterhouse generated a variety of organic-rich wastes which it fed to an anaerobic digester for the purpose of reducing solids and generating biogas used to heat the facility. The facility's operators were forced to underload the digester due to poor performance during highloading operations. The operators contacted Novozymes for a biological solution that would help stabilize the digester, allow for increased loadings, and improve reactor efficiency.

## Application

The facility processes 300 to 400 head of swine per day, and operates its own wastewater treatment system. The wastewater treatment system treats approximately 250 m<sup>3</sup> (66,000 gallons) of wastewater per day. The treatment system includes an anaerobic digester for the treatment of waste-activated sludge.

In order to reduce costs associated with disposal of other solids and high-strength wastes, the facility also feeds the digester intestinal wastes, straw, blood, and manure as well as other process wastes. The digester is fed with approximately 35–40 tons per day of waste which is approximately 8% total solids. In general, the digester is capable of reducing the waste feed to a sludge that is only 1.8% in total solids (a 76% reduction in solids).

The breakdown of sludge and high-strength wastes generates a methane-rich biogas which is recovered to fuel in a combined heat and power (CHP) generator which is used to heat the slaughterhouse. The plant manager was satisfied with the performance of the digester in low-loading operation; however, the system had been designed to treat larger loads. By increasing the loading, the plant manager desired to improve efficiency and reduce external disposal costs. BG Max™ 3000, a blend of beneficial microorganisms and fast-acting enzymes, was added to the inlet of the anaerobic tank.

## Results

Only one month after the beginning of the treatment, substantial improvements were noted. The customer generated an additional 538 m<sup>3</sup> (19,000 ft<sup>3</sup>) of biogas per day, a 29% increase. Not only had the volume of biogas been increased, but the efficiency of the operation had improved to such a degree that the plant managers

could continue to load the digester at maximum loading. As a result of greater biogas production, the rate of electrical

power generation by the CHP increased by 51% (an additional 1,800 kWh/day).

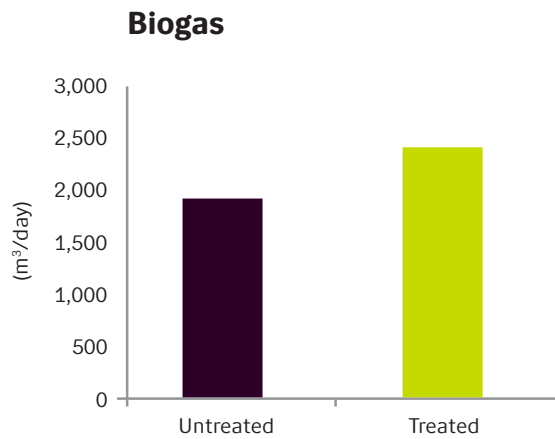


Fig. 1. Biogas production increased with the use of BG Max™ 3000.

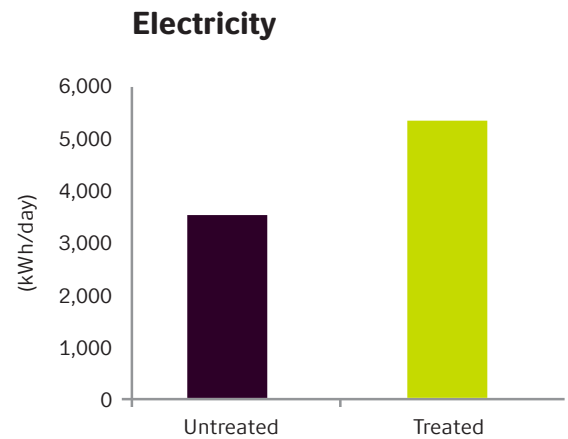
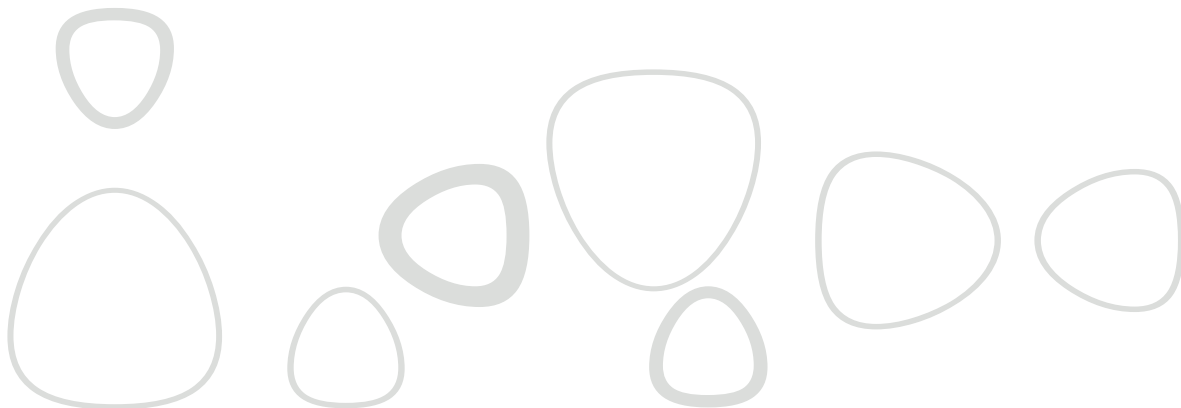


Fig. 2. Productivity improved with the use of BG Max™ 3000.

## Conclusion

The addition of BG Max™ 3000 improved the operation and productivity of an anaerobic digester being fed slaughterhouse wastes. This resulted in:

- **Improved stability of the digester operation**
- **Increased biogas production**
- **Reduced cost of waste treatment**
- **Decreased energy demand**
- **Improved sustainability**





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#### **About Novozymes**

Novozymes is the world leader in biological solutions. Together with customers, partners and the global community, we improve industrial performance while preserving the planet's resources and helping to build better lives. As the world's largest provider of enzyme and microbial technologies, our bioinnovation enables higher agricultural yields, low-temperature washing, energy-efficient production, renewable fuel and many other benefits that we rely on today and in the future. We call it Rethink Tomorrow.

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