

How BioHiTech Digesters Return Water from Food Waste Water Cycle

Key Takeaways

- BioHiTech Digesters return water from the food waste to the water cycle.
- Food waste generated from commercial and industrial facilities that are discharged to the sanitary sewer by the dishwashers, garbage disposals, and floor drains are all highly organic and can create issues for the operational efficiency of the WWTP. The Digester reduces the organic levels of food waste by up to 99%.
- The microorganisms that BioHiTech uses in the digesters are the same as those used at the WWTP. The release of them to the sanitary sewer lines is beneficial because they continue to digest and clean the lines and can jump-start the secondary treatment process at the WWTP.
- The effluent from the Digesters results in biosolids, which can be beneficially reused as fertilizer and soil amendments.
- Not only are the Digesters a good disposal option, they have positive downstream effects as well.

[BioHiTech Digesters](#) are a simple technology that eliminates food waste on-site. Since the digested food waste is converted into wastewater, it is natural to use the municipal sewer systems to transport that water to wastewater treatment facilities where it will be recovered. There is no waste to store or transport and no residual solids to handle or manage.

70% of the food waste digested by the Digesters is returned to the overall water cycle as water¹. The remaining 30% is organic matter which is digested in the Digester to further reduce the volume of organics and discharged to the sanitary sewer lines. The sanitary sewer lines throughout communities collect from various commercial, industrial, and residential entities and eventually co-mingles at the local wastewater treatment plant (WWTP).

The food wastes from commercial and industrial facilities that are discharged to the sanitary sewer by the dishwashers, garbage disposals, and floor drains are all highly organic and can create issues for the operational efficiency of the WWTP. The Digester reduces the remaining 30% of organic levels of food waste by up to 99%. The remaining amount of organics in the effluent includes not just the food waste but also small quantities of residual microorganisms that go down the drain with the food waste. The microorganisms that we at BioHiTech use in the digesters, are the same as those used at the WWTP. The microorganisms involved are mainly in the bacteria and protozoa families, with added fungi and rotifers to assist with the more woody-like organics².

The release of these microorganisms into the sanitary sewer is beneficial to the customer as they can clean the sewer lines between the digester and the co-mingled discharge point and are beneficial to the local community and the WWTP in that they continue to “eat” the organics throughout the sanitary sewer system.

¹ Brown, Amy Christine. (2011) Understanding Food: Principles and Preparation. 5th Edition. University of Hawaii, Manao.

² VonSperling, Marcos. (2007). Basic Principles of Wastewater Treatment. 12 Caxton Street, London, UK. IWA Publishing, Alliance House.

Once the Digester effluent reaches the WWTP, it goes through their primary, secondary and in some cases tertiary or advanced treatment. One of the challenges that WWTPs face is the management of slugs of excessive organics and fats, oils and greases. At BioHiTech we suggest that all customers that use the digesters for meats or dairy products route their effluent pipe through the customer's kitchen grease interceptor. This reduces and in some cases, eliminates the fats, oils, and greases that may not complete digestion prior to discharge from the digester.

During primary treatment at the WWTP the plastics, rags, sticks, etc. are caught by a screen and removed from the waste water. Then the wastewater goes through a grit chamber where sand and stones are removed. The remaining wastewater still contains organic and inorganic matter along with other suspended solids³. Since no non-organic materials are placed in the Digesters, the effluent does not place a burden on the WWTP. This remaining wastewater then goes to the sedimentation tanks where the suspended solids gradually fall to the bottom of a tank and form a mass of solids called biosolids.

These biosolids have beneficial reuse purposes as fertilizer and soil amendments, as well as amendments for [active composting facilities](#)⁴. The undigested portion of the organics in the effluent from the Digester will become an element of these biosolids. However, there are still the microorganisms and some residual organics that are too small/light to fall to the bottom of the sedimentation tanks. These go onto the secondary stage of treatment.

In the secondary stage of treatment, about 85% of the organic matter in sewage is treated by using microorganisms. The process of the Digester is very similar to the process of the secondary treatment stage. In the secondary treatment stage, organics are exposed to oxygen and microorganisms which breaks down the organic matter into harmless by-products. As stated previously, microorganisms used in the Digester are the same as those used by the WWTP. In effect, the Digester is “jump-starting” the secondary treatment stage.

While the Digester customer may be satisfied with the cost-efficient alternative method to organics disposal that is provided, there are additional benefits that can be achieved. The biosolids generated during the primary treatment stage can be beneficially reused and the microorganisms being introduced to the sanitary sewer lines are “eating away” at potential clogs and providing overall cleaning properties to the system. The microorganisms go on to boost the existing microorganisms used at the WWTPs. Not only are the Digesters a good disposal option, they have positive downstream effects as well.

³ Environmental Protection Agency. (1998). How Wastewater Treatment Works...The Basics. (EPA 833-F-98-002). Website: <https://www3.epa.gov/npdes/pubs/bastre.pdf>

⁴ “Biosolid Benefits”. Retrieved from Biosolid.com. 2002 Website: <http://www.biosolids.com/benefits>.

