



Water & Environmental Technologies

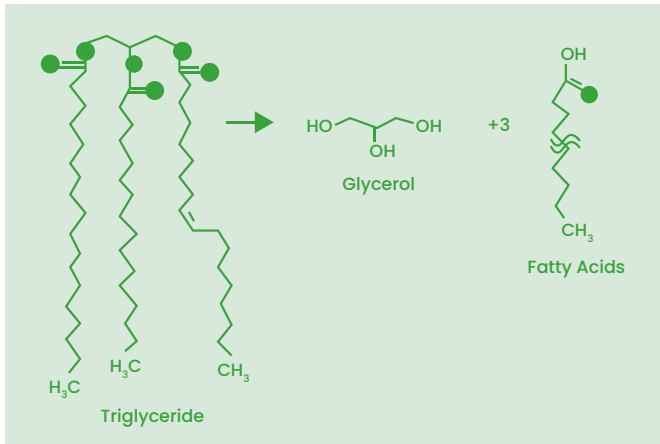
# BioRemove FOG

BioRemove FOG is a biological formulation of beneficial microorganisms selectively adapted for application to food and other industrial wastewaters that contain fats, oils, and grease (FOG). BioRemove FOG contains microorganisms that have been selected for their superior ability to degrade FOG. BioRemove FOG is effective in a wide variety of industrial and food processing applications, including meat, dairy, baking, beverage, rendering, vegetable processing, and others that experience elevated FOG levels in the wastewater system.

## Benefits

FOG is problematic in many wastewater systems. Due to its slow natural degradation, high BOD, and insolubility in water, FOG has tendency to build up in collection systems as well as in the treatment units within the wastewater system. FOG can build up and cause blockages to wastewater flows, reduce treatment efficiency, promote filamentous bulking, promote foaming, and cause malodors.

FOG is primarily composed of large water-insoluble triglyceride molecules (Fig. 1). These triglycerides are made up of a glycerol and three fatty acids (most commonly palmitic, stearic, and oleic acids). While many naturally occurring microorganisms have the ability to produce extracellular enzymes to cleave the fatty acids from the triglyceride, not many organisms have the ability to further break down these fatty acids. As a result, BOD removal efficiency can decrease, pH can drop with the acid buildup, and some of the fatty acids can become volatilized as noxious odors.

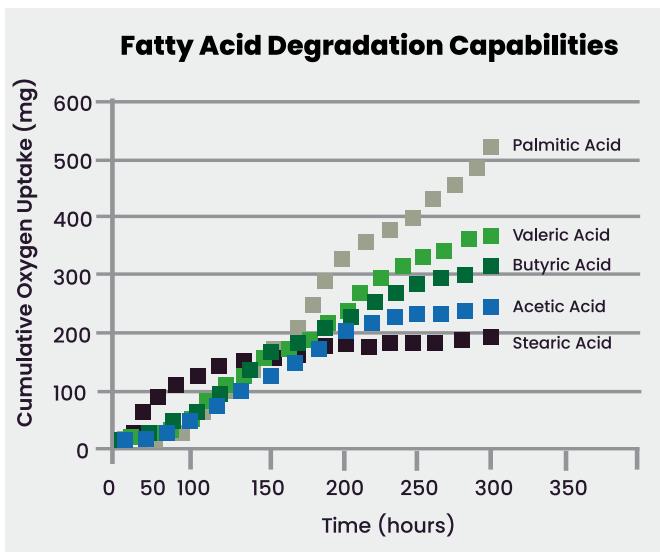


BioRemove FOG contains microorganisms for enhancing FOG and fatty acid degradation and simplifies operations by preventing grease buildup and minimizing the cost and effort of FOG removal. It can also reduce effluent FOG concentration and prevent outbreaks of filamentous bacteria like *Nocardia* and *Microthrix*. Complete degradation of volatile fatty acids reduces the risk of noxious odors related to the breakdown of food wastes.

**Fig. 1** Structure of a triglyceride.

## Performance

Using our intensive screening process, microorganisms in BioRemove FOG were carefully selected for their ability to cleave the fatty acids from the triglycerides and degrade them. Our strains have been demonstrated to metabolize a range of both long- and short-chain fatty acids.



**Fig. 2** Respirometry results showing growth on a variety of short- and long-chain fatty acids.

BioRemove FOG is an effective solution for degrading FOG in food processing wastewater. A food processor was experiencing grease-related foaming in the aeration basin. A thick foam covered 70–80% of the surface of the basin, leading to high defoamer costs and settling problems in the secondary clarifier. Evaluation of the site concluded that the indigenous microbial community was unable to handle the grease load. The wastewater plant began a program with BioRemove FOG that was designed to enhance the microbial community's ability to degrade FOG. Within one sludge age, BioRemove FOG led to FOG degradation such that only 10–15% of the surface area was covered with foam. With continued treatment and significant improvement in FOG degradation efficiency, settling improved and the need for defoamer and FOG removal activities was eliminated.



**Fig. 3** Before using BioRemove FOG.



**Fig. 4** FOG and foam reduction using BioRemove FOG.

## Recommended Use

**BioRemove FOG can be used for multiple applications, including:**

- Daily dosing in the aeration basin to maintain the health of the microbial community
- Dosing to minimize FOG buildup in areas such as the headworks, DAF, or primary clarifier
- Increased dosing during high FOG loadings
- Seeding during plant start-ups

The dosage rate for BioRemove FOG is dependent upon the volume of the biological reactor, the FOG loading, and the amount of grease buildup in the system. During the initial seeding period, an increased dosage is recommended to quickly establish the microorganisms in the system. When the microbial community is established, regular maintenance dosing is necessary to maintain an accelerated level of biological activity.

## Optimum pH and Temperature

The microorganisms in BioRemove FOG perform within pH range 4.5–8.5, with an optimum near 7.0. Wastewater temperature affects activity, with an approximate doubling in maximum growth rate for each 10 °C (18 °F) increase in temperature to an approximate upper limit of 45 °C (113 °F).

## Product Characteristics

PRODUCT	APPLICATION	PHYSICAL FORM
BioRemove FOG	FOG removal	Dry tan powder. A liquid alternative is also available.

## Safety, Handling, and Storage

Store in a cool, dry place. Avoid inhalation of dusts. Wash hands thoroughly with soap and water after handling. Avoid contact with eyes. More information can be found in the corresponding product safety data sheet (SDS).

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