

## BiOWiSH® Aqua FOG

### BiOWiSH® Aqua FOG Improves Effluent Treatment in Fast Food Processing Plants in Indonesia

#### Background

Two fast food processing plants located in Jakarta, Indonesia produce half-ready food for their fast food restaurants in every mall in the city. One of these plants is a meat processing plant and the other is a food-seasoning processing plant. Both processing plants contain effluent treatment processes, whose outlets are centrally processed at a main wastewater treatment plant.

#### Meat Processing Effluent Treatment Plant

The meat processing plant produces around 50 m<sup>3</sup>/day of wastewater. The plant consists of control tanks, grease traps, and aerated tanks whose outlets are pumped into the equalization (EQ) tank of the main treatment plant (as shown in figure 9). At the end of every month, grease is pumped out of the grease traps. In total, the meat processing effluent treatment plant has a mean retention time of 2.5 days. Pollutant concentrations before and after effluent treatment are shown below.

	COD (mg/L)	BOD (mg/L)	Ammonia (mg/L)	FOG (mg/L)
Before Effluent Treatment	2100	826	31	200
After Effluent Treatment	1721	650	59	157

Table 1: Pollutant concentrations before and after meat processing effluent treatment



Figure 1: Effluent control tank 1



Figure 2: Effluent control tank 2

### BiOWiSH® Aqua FOG



- Rapidly reduces fats, oils, and grease
- Reduces sludge production and handling
- Increases plant capacity
- Reduces odors
- Reduces aeration requirements
- Reduces need for chemical additives
- Improves plant stability
- Reduces hydrogen sulfide, ammonia, and nitrates
- Pre-treats influent in collection systems
- Natural and non-toxic

#### Available Sizes

- 100g/3.5oz
- 1kg/2.2lbs
- 5kg/11lbs
- 10kg/22lbs



Figure 3: Effluent control tank 3



Figure 4: Effluent control tank 4



Figure 5: Inlet tank

### Food-Seasoning Effluent Treatment Process

The food-seasoning processing plant produces 20 m<sup>3</sup>/day of wastewater. A simple 15 m<sup>3</sup> grease trap was built here to reduce excessive suspended solids and fat content flow into the main treatment plant. The outlet of this 15 m<sup>3</sup> grease trap is pumped to the EQ tank of the main treatment plant to mix with the outlet of the meat processing effluent treatment plant (as shown in figure 9). Pollutant concentrations before effluent treatment are shown below.

	COD (mg/L)	BOD (mg/L)	TSS (mg/L)	Ammonia (mg/L)	FOG (mg/L)
Before Effluent Treatment	2000	771	468	12	58

Table 2: Pollutant concentrations before food seasoning effluent treatment



Figures 6, 7, & 8: Grease trap in the food seasoning treatment process

### Main Treatment Plant

The main treatment plant consists of an EQ tank, electrocoagulation unit, clarifier, and an effluent tank. The electrocoagulation unit is built to separate solids from the wastewater and collect them in a sludge container. Routine samples are taken from the EQ tank to test the quality of the wastewater mixing. Pollutant concentrations in the EQ tank and after the clarifier tank are shown below.

	COD (mg/L)	BOD (mg/L)	TSS (mg/L)	Ammonia (mg/L)	FOG (mg/L)
EQ Tank	2159	768	730	48	121
After Clarifier	632	246	88	36	6

Table 3: Pollutant concentrations in the EQ tank and after the clarifier

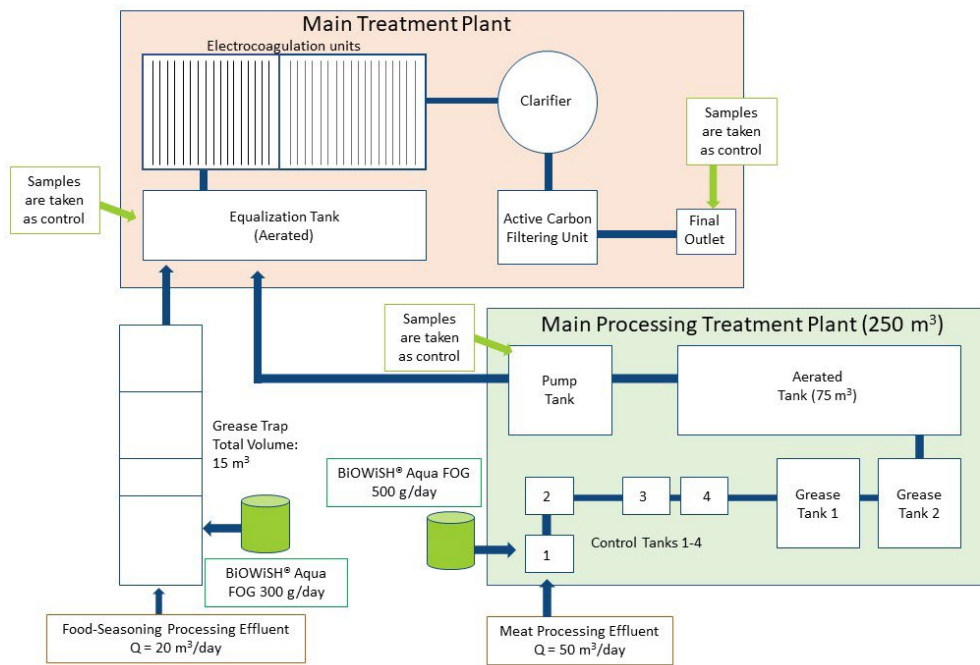


Figure 9: Diagram of the entire process: two effluent treatment processes converging at the main treatment plant



Figure 10: EQ Tank of the main treatment plant



Figure 11: Electrocoagulation unit of the main treatment plant

## Objective

CV Abatemen Karya Bersama, an authorized distributor of BiOWiSH Technologies in Indonesia, presented BiOWiSH® Aqua FOG as powerful blend of biocatalysts to reduce COD, Ammonia, and FOG content and to reduce excessive fat sludge in the fat trap tanks at both stream sources. The first dosing was in February 2018.

## Solution

500 g of BiOWiSH® Aqua FOG was dissolved into a 300 L clean water tank daily for meat processing treatment and 300 g BiOWiSH® Aqua FOG was dissolved into a 300 L clean water tank to dose daily for the food-seasoning effluent treatment process. These dosing tanks are located on the inlet of each pretreatment process as the pH and temperature in those tanks are in suitable range.



Figure 12: Meat processing dosing tank



Figure 13: Food seasoning dosing tank

## Results

The results were noticeable 2 months after BiOWiSH® Aqua FOG application. Samples were taken from 3 points: the outlet of the meat processing treatment plant, EQ tank of main treatment plant, and the final outlet of the main treatment plant (as shown in figure 9). Samples were taken every week, starting from the 5<sup>th</sup> week after dosing BiOWiSH® Aqua FOG up to the 10<sup>th</sup> week. The samples were tested for BOD, COD, TSS, Ammonia, and FOG content.

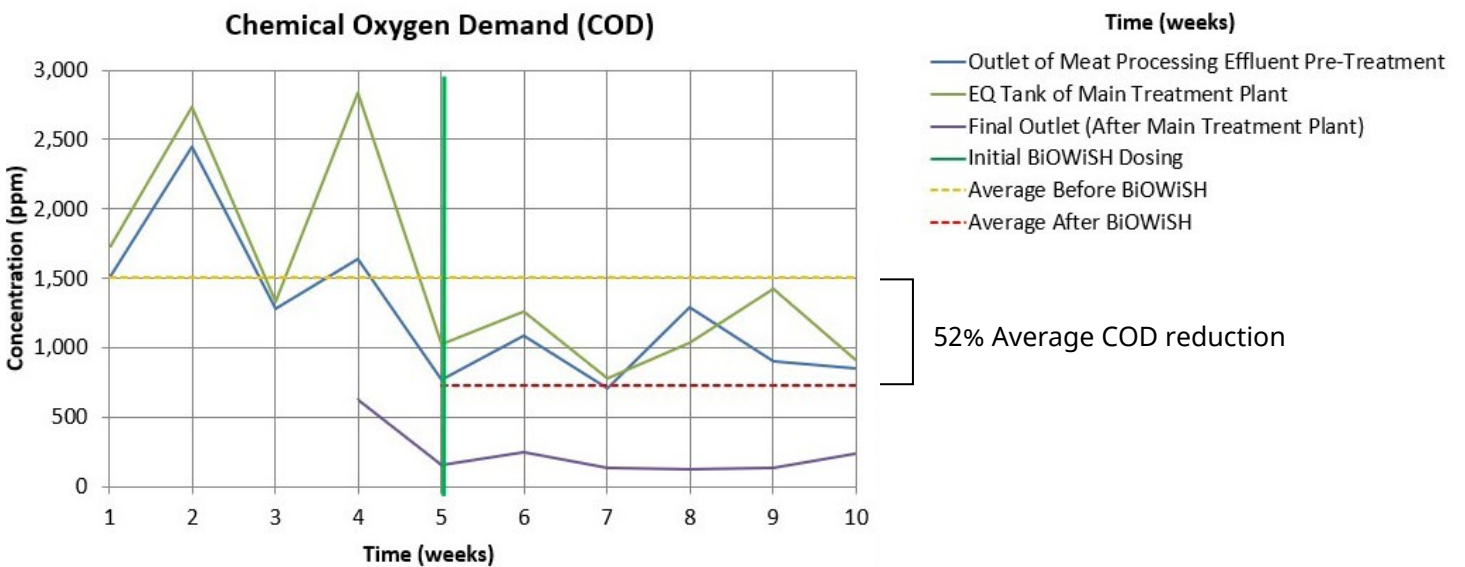


Figure 14: COD reduction

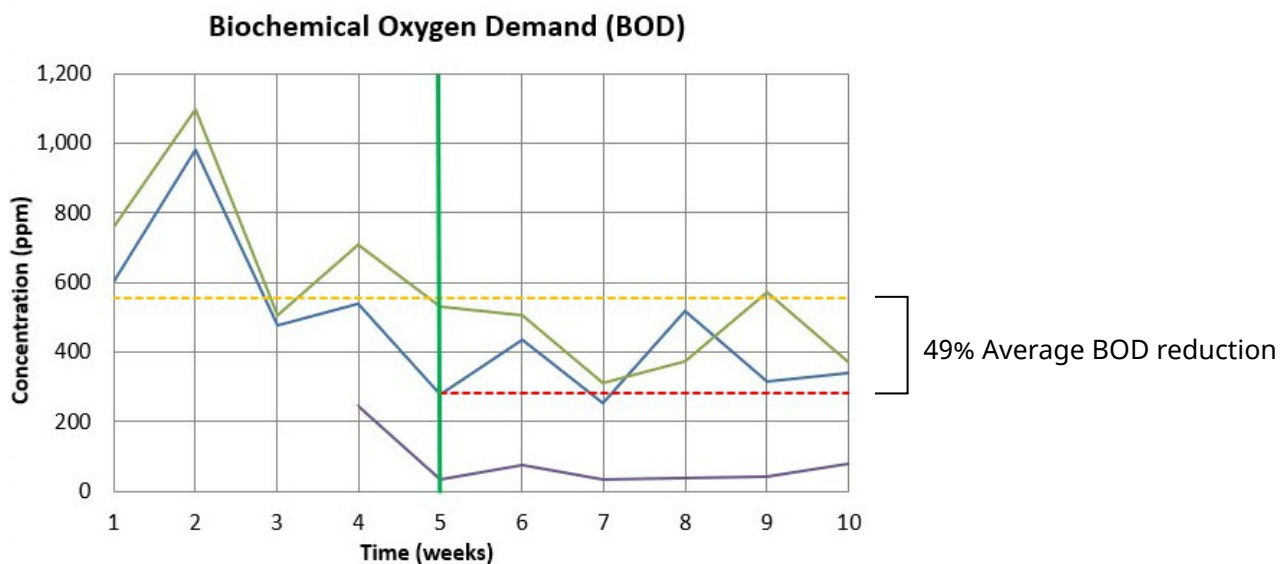


Figure 15: BOD reduction

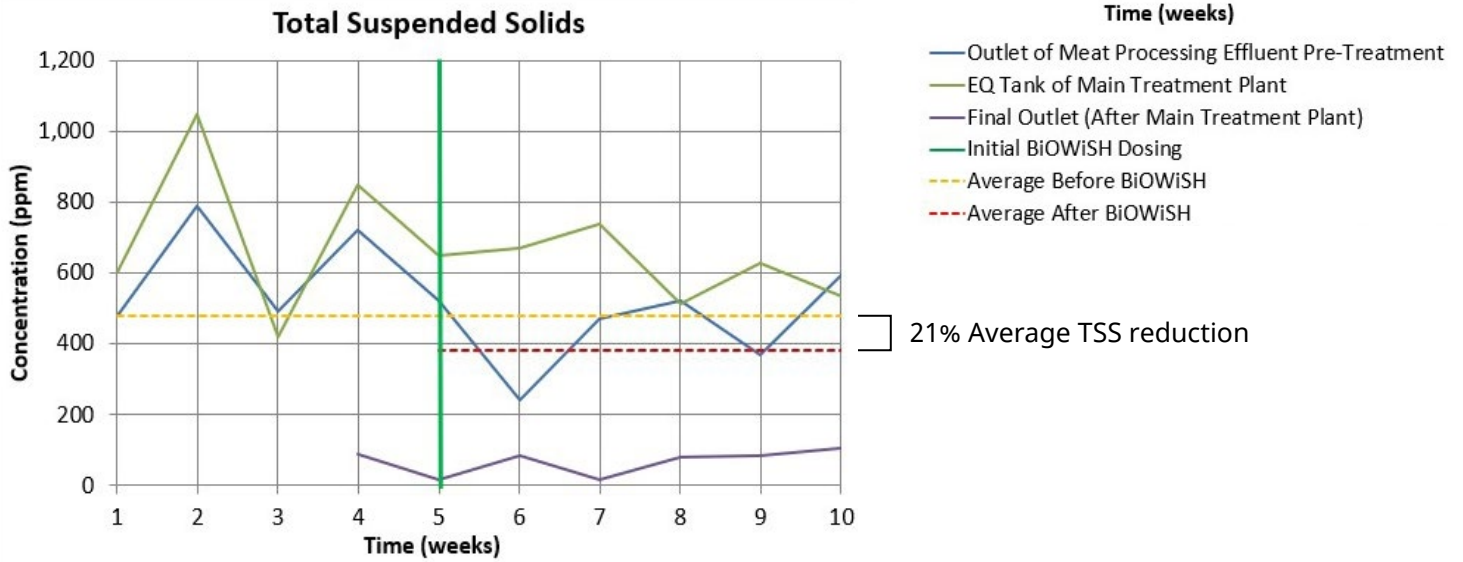


Figure 16: TSS reduction

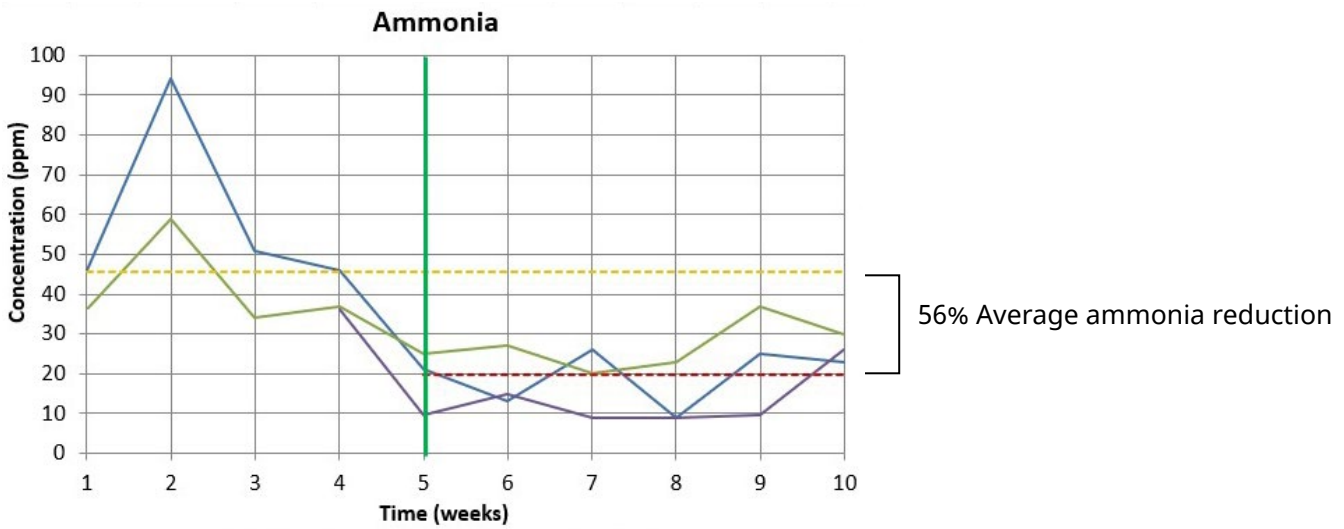


Figure 17: Ammonia reduction



Figure 18: FOG reduction

A change in consistency of the floating sludge was also observed. Before BiOWiSH® implementation, it was hard and thick. It then became more tender after a couple of weeks. During their regular sludge pumping activities, the operator had to breakdown the hard-fat sludge manually so that it could be easily pumped by air pump to the truck. After a couple weeks of dosing BiOWiSH® Aqua FOG, it became soft and thin enough to easily pump. With this significant achievement, the plant manager decided to reduce the period of fat sludge pumping from the end of every month to once every 3 months (about 60% cost reduction of fat sludge hauling).



Figure 19: Sludge tank before BiOWiSH®



Figure 20: Sludge tank after BiOWiSH®

## Conclusion

The BiOWiSH® Aqua FOG application has been declared successful in helping reduce the FOG content significantly by the quality and quantity of data that was given. It has helped the plant reduce the loading of pollution, especially FOG content. It has also helped the plant to reduce the sludge pumping frequency and handling cost.

## Contact Distributor in Indonesia



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