BiOWiSH® TECHNOLOGIES

Case Study

BiOWiSH® Aqua FOG

Reducing Sludge Removal Costs at JBS Beef Processing Plant, Colorado

Background

JBS is a large, multinational meat processing company with over 140 production facilities worldwide. Their beef processing plant located in Greeley, Colorado embarked on a project to improve the operation and efficiency of the plant's existing wastewater system. The project had very specific goals:

1. Solids Reduction

2. Biochemical Oxygen Demand (BOD) Reduction

Wastewater flows from a series of anaerobic lagoons to an anoxic section, followed by aeration Basins and finally into a large holding pond. Sludge is removed by truck abd hauled to a landfill for composting. The plant had identified potential cost savings opportunities from reduced sludge production that would impact hauling fees and improve their environmental footprint, maintenance, and operation. There was also a "grease cap" covering the surface of the plant's lagoon, consisting of a significant amount of insoluble fats, oils, and greases. The project was run in parallel against a separate, identical control lagoon for comparison.

Environmental Results	Economic Benefits
Sludge reduced by 4,444 tons in 90 days	$17,790 reduction in removal costs
5,556 cubic yards eliminated from composting	$269,056 cost savings in transport and delivery fees
CO_2 footprint reduced by 124,800 lbs	Equivalent to removing 10.9 cars from the road for an entire year
Reduced pollutant levels (BOD)	Improved corporate social responsibility and security against NPDES fines

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

Solution

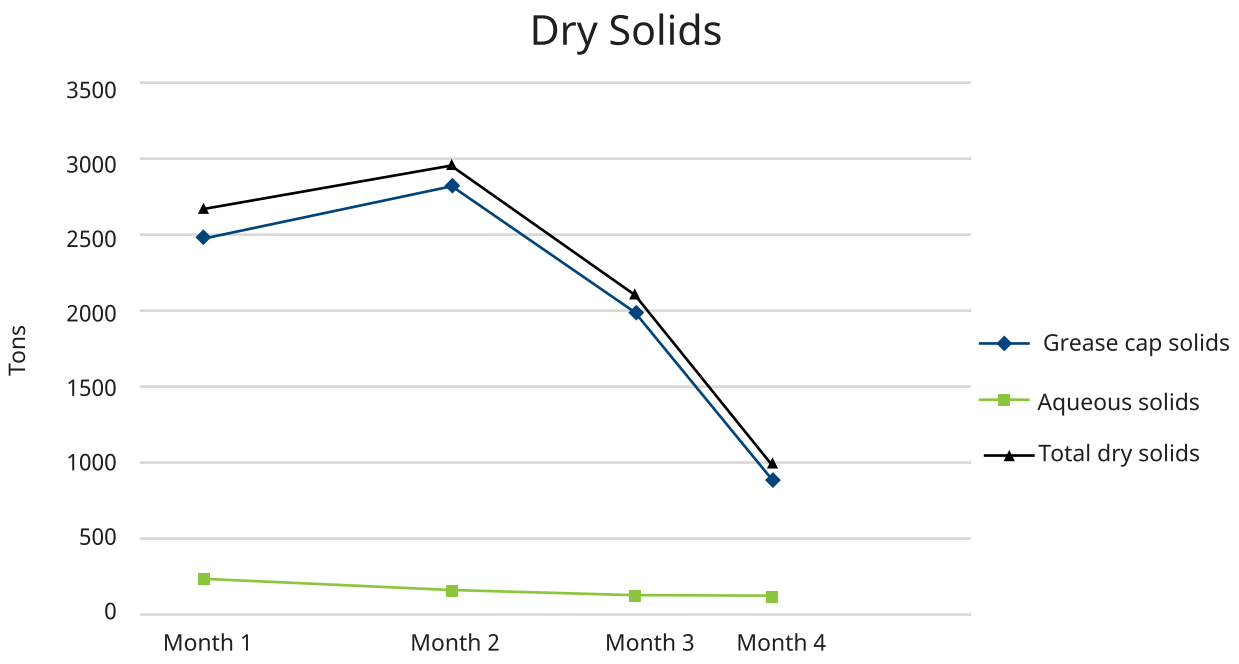
In partnership with Bruce Parker Consulting (www.bpagconsultants.com), JBS approached BiOWiSH Technologies for a solution to reduce the overall sludge production at the wastewater treatment facility. BiOWiSH® Aqua FOG was identified as a treatment strategy that could meet the stated goals. BiOWiSH® Aqua FOG is a novel composite biocatalyst consisting of extracellular co-factors, enzymes, and microbial components. The product acts to reduce odor, VOC, COD, BOD, FOG, and TSS. A further benefit of the product is that it is 100% natural and non-toxic to the environment. The lagoons had high effluent parameters and a significant "grease cap" overlaying a sizable portion of the two lagoons. Data from each of the two treatment lagoons was aggregated into the data shown. The samples were taken by the client and were tested by third party laboratory analysis.

Results

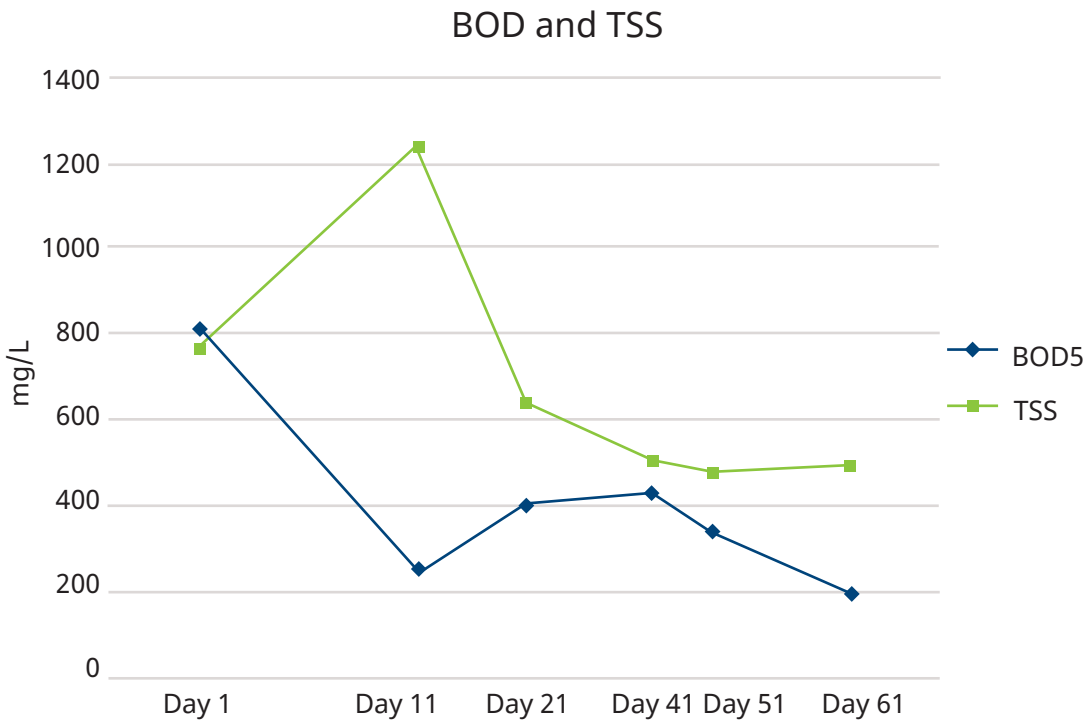
In less than three months, BiOWiSH® Aqua FOG significantly reduced sludge, waste being sent to landfills, and pollutant levels. These reductions saved the facility $193,266 (net of BiOWiSH® investment and related costs) in the three month period and dramatically reduced its carbon footprint.

	BOD5 mg/L	TSS mg/L	VSS mg/L
Week 1	810	770	650
Week 3	252	1240	N.A.
Week 4	400	640	500
Week 5	430	505	435
Week 6	339	480	415
Week 7	192	493	467

BiOWiSH® Aqua FOG dramatically reduced dry solids following an initial period of increased suspended solids. This trending was primarily within the grease cap layer. As treatment continued, the new and existing biology acclimated to both the environmental parameters of the aqueous system and the metabolic benefit provided by the BiOWiSH® Aqua FOG biocatalyst. The acclimation of the biology is shown by the reduction in solids during the latter period of the trial. The reduction of solids within the system is likely due to both improved settling of the solids, and improved degradation of the biodegradable portion of the suspended solid



The increase and subsequent decrease in solids can be explained by examination of the lagoon BOD and Total Suspended Solids (TSS) data. Figure 2 shows the BOD and TSS of the lagoon system. After the BiOWiSH® dosing starts, there is a quick period of biological growth and instability, followed by much improved biological stability and corresponding BOD and TSS numbers. The period of biological instability is characterized by significant increase in TSS due to growth of new biology, followed by sharp decrease in TSS as the bacteria acclimates to the enzyme biocatalyst.



Using BiOWiSH® Aqua FOG also reduced greenhouse (CO_2) gas emissions by 124,800 lbs - or the equivalent of removing nearly 11 cars from the road for an entire year. This calculation was made based on BiOWiSH® Aqua FOG reducing the amount of materials being transported to the composting facility by more than 1,700 tons and a reduction in energy consumption typically associated with pumping.

Conclusion

BiOWiSH® Aqua FOG reduced solids at the JBS beef processing facility, resulting in significant economic and environmental benefits. Due to cost savings from a reduction in sludge hauling, the plant experienced a 206% return on investment from the use of BiOWiSH® Aqua FOG. Sludge accumulation was reduced by more than 50% in just three months, reducing the need to compost the waste and incur transport and delivery costs. This also resulted in a reduction of CO_2 emissions due to minimized hauling and transport. The plant managers also observed better process stability, which reduces maintenance and operating costs.

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