Dairy Waste Bio-Augmentation

BIO-SYSTEMS INTERNATIONAL

Specifications

Form:	Free-flowing granular powder
Color:	Brown or Blue
Nutrient Content:	Biological nutrients & stimulants
Plate Count:	5 billion per gram

Packaging

250 grams water soluble packages protected by a foil overwrap.
10 kilos per plastic pail.

Storage

DO NOT FREEZE! Store in a cool dry location. Do not inhale dusts, avoid excessive skin contact. SEE M.S.D.S.

Application Instructions

Treatment Plants

Flow Rate	Initial Dosage	Maintenance**
Up to 1,000 gpd	½ lbs. per day for 3 days	½ lb. per week
Up to 5,000 gpd	½ lbs. per day for 3 days	1lb. per week
Up to 20,000 gpd	5 lbs.*	1½ lb. per week
Up to 50,000 gpd	8 lbs.*	2 lb. per week
Up to 250,000 gpd	15 lbs.*	¼ lb. per day
Up to 500,000 gpd	25 lbs.*	½ lb. per day
Up to 1 mgd	50 lbs.*	1 lb. per day
Up to 5 mgd	50 lbs. per mgd*	1 lb. per mgd per day
Up to 12 mgd	50 lbs. per mgd*	¾ lb. per mgd per day
Up to 100 mgd	30 lbs. per mgd*	½ lb. per mgd per day

*** Spread this initial dosage out over the course of 10 days.**
**** Add as regularly as possible. If it is required to miss one day, add that day's product with the next dosage.**

Dosage rate will vary with flow rates, retention times and system variations. The rates above are for a typical, well maintained system.

Activated Sludge Systems

Activated Sludge Systems include various process flow sheets for example: Extended Aeration, Contact Stabilization, Step Aeration, Oxygen Activated Sludge. The application rate for all products is based on the average daily flow rate to the aeration basin, excluding the return sludge stream. For seasonal or widely fluctuating flows, contact your BIO-SYSTEMS technical representative.

Trickling Filter and Rotating Biological Contactors

The application rate for all products is based on the average daily flow rate to the filter or contactor, excluding any recirculating process stream. For seasonal or widely fluctuating flows, contact your BIO-SYSTEMS technical representative.

Lagoon Systems

- For aerated lagoon systems, the application rate based on the average flow to the lagoon.
- For facultive lagoon systems, the application rate is based on the lagoon surface area:
  - Day 1 through Day 5 — 20 lbs. per acre per day
  - Day 6+ — 2 lbs. per acre per week
- For anaerobic lagoons, the application rate is based on the total volume of the anaerobic lagoon.
  - <100,000 gallons 1 lb. - 2x per week per 5,000 gal.
  - >100,000 gallons ½ lb. - 1x per day per 5,000 gal.
- For lagoons in cold climates, commence program when the water temperature is a least 50°F

Case History 1001

A Midwest Dairy started up a new SBR pretreatment system for their dairy waste. After six months of operation, the treatment plant performance was adversely affected by poor settling and foaming due to Nocardia. Within 60 days of starting the BIO-SYSTEMS program the 30 minute settling test had improved from 950 to 400 and foaming was under control.

Case History 1021

300,000 gpd of dairy waste water with oil and grease content of 50-320 mg/l lead to excessive scum formation and elevated TSS in the effluent of a 20 mgd municipal oxygen activated sludge system. It was decided to try BIO-SYSTEMS to reduce influent oil and grease loadings and start the biological treatment process in the force main. Application rate was 15 lbs. per day to pump station dedicated to the dairy.

Results were quick and dramatic with scum coverage of the secondary clarifiers reduced from 90% of thick scum to less than 10% of very thin scum with a return to normal and consistant effluent TSS within 3 weeks.

Milk, Whey and Dairy Products

Your local Distributor is:

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1-800-232-BUGS
2847
www.BIOBUGS.com

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Description

BioBug DM contains a specially formulated range of adapted, high-performance microorganisms for use in biological wastewater treatment of dairy wastes. As well as microorganisms, BioBug DM contains a micronutrient blend specifically selected for milk processing wastes. This micronutrient blend provides a complete formulation for maximum biological activity and reacts with dairy waste to produce biological enhancers.

In addition to bacteria elements, the presence of a complex of cellulases, hemicellulases, amylases and lipases in BioBug DM provide the capacity to degrade extra cellular polymers (which cause foaming) and surpress the growth of the filamentous organisms by affecting the structure of the filaments.

Effect

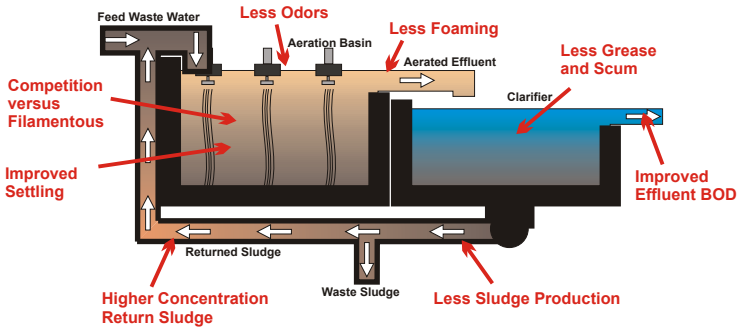
BioBug DM, with its aerobic and facultative anaerobic microorganisms establishes and maintains a biomass which by providing greater resistance to the effects of organic inhibitors present in dairy waste waters, is able to perform more effectively than the naturally occurring biomass. BioBug DM ensures that the natural mechanism for the selection of the biomass population is presented with a range of selected microorganisms. These aerobic and facultative anaerobic bacteria have been taken from their natural environment and then adapted to give optimum performance.

Benefits of BioBug DM:

- **Helps start-up in new plants**
- **Improves effluent quality**
- **Reduces grease buildup**
- **Increases overall efficiency**
- **Controls Filaments**
- **Lowers odors and foam**

Bacterial Formulation
Plus
Bio-Enhancer
Plus
Micronutrient

- Enhance organic removal efficiency of biological systems, providing lower effluent BOD, COD, and TSS.
- Enhance solids settling where it has been disturbed by loading fluctuations.



- Accelerate the start-up of new systems and aids recovery after upsets.
- Improve cold weather operation.
- Mitigate effects of dairy related loadings and toxic shocks.
- Reduce sludge production.
- Lower operating costs by reducing chemical consumption.
- Competes against filaments.

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