



**MicroSynergies**<sup>®</sup>  
bringing technology and people together.<sup>®</sup>

## **MicroChoice**<sup>®</sup> GTP Grease Trap Powder

**A highly concentrated powder blend of multiple bacterial spores, specifically selected to function in the grease trap environment.**

Refinery wastewater contains petroleum hydrocarbons and non-petroleum organic wastes. For this reason, **MicroChoice**<sup>®</sup> GTP Grease traps are often the most neglected and difficult to manage problem in institutional kitchens today.

Not only are grease traps unsightly and odorous, they are inconvenient and expensive to pump and maintain. Biological products have been used for years for grease trap maintenance. These products reduced solids and odors, but did not perform well in low pH or high fat situations.

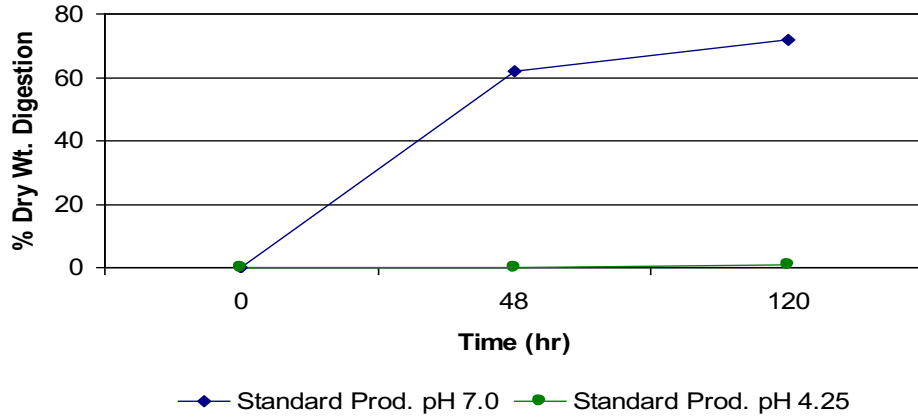
Understanding these limitations, **MicroChoice**<sup>®</sup> GTP was developed to address these concerns. After years of research, we are pleased to release this product, **MicroChoice**<sup>®</sup> GTP which is specially formulated to address the

types of waste found in grease traps. The following pages will describe the development of **MicroChoice**<sup>®</sup> GTP and explain the technology behind the product.

### **Low pH Effectiveness**

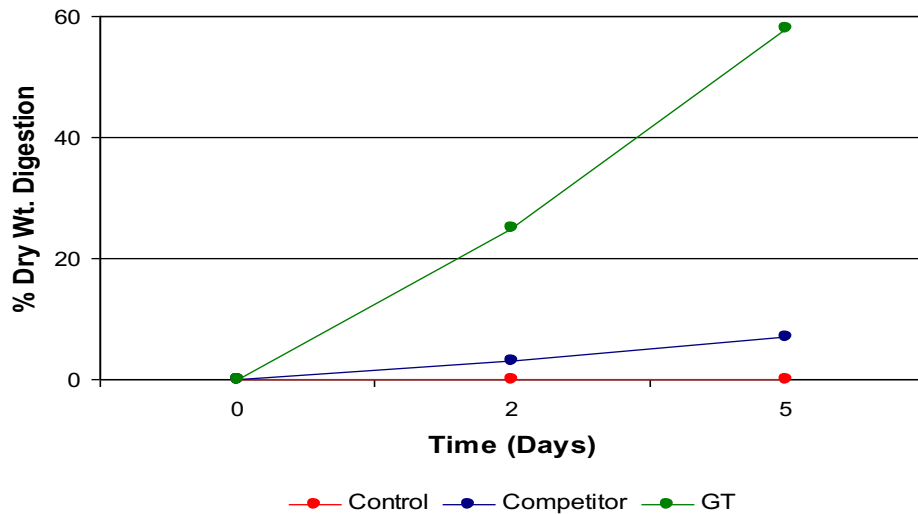
One major reason for grease trap failure is the inability of standard grease trap products to function at low pH. By testing grease traps in the field, and interviewing our customers and grease trap pumpers, we found the majority of traps to have a pH of 4.5 - 6. With this information, we tested the ability of the bacteria in standard grease trap products to function at a worst-case pH of 4.25. Not surprisingly, we found that standard products were not capable of functioning at this low pH (Figure 1).

**Figure 1 - Waste Digestion Effectiveness**



To develop a product that functions in the low pH of a grease trap, bacteria were isolated from low pH environments such as pine forests and cranberry bogs, where nature has already selected strains that are capable of functioning at low pH. The result was the isolation, selection, and development of two *Bacillus* strains that grow, degrade waste, and reduce odors at pH 4.25. These strains are included in GTP. As shown in Figure 2, these strains significantly improve the efficacy of **MicroChoice® GTP** over the competition.

**Figure 2 - Waste Digestion Effectiveness  
pH 4.25**



## Superior Fat Digestion

Using a similar bacterial selection system, new bacterial strains capable of digesting high levels of Fat, Oil, and Grease (FOG) were isolated. These superior lipase producers not only degrade short chain fat molecules commonly degraded by the bacteria in most grease trap products, but also the more difficult to digest long chain fat molecules that are major contributors to FOG accumulation in the trap. Further testing of these new strains revealed the production of a biosurfactant, which helps to increase the bioavailability of the FOG as a microbial food source. These activities are shown in the pictures below (Figures 3 and 4).



**Figures 3 and 4 - Fat Degradation capabilities of two isolates compared to a commercially available grease trap product**

The isolation of these superior fat degrading strains prompted a study to investigate the ability of the bacteria in **MicroChoice® GTP** to degrade Crisco (vegetable shortening). The study was performed utilizing a minimal medium with Crisco as the carbon source. The study was performed at pH 4.3 to mimic the conditions in a grease trap. Two fully formulated products (surfactant containing) commercially available grease trap products were included in the study for comparison. The **MicroChoice® GTP** treatment did not contain surfactant. As demonstrated in Figure 4, **MicroChoice® GTP** showed a significant improvement over the competitor's commercially available grease traps products, even without the addition of surfactant.

## Odor Reduction

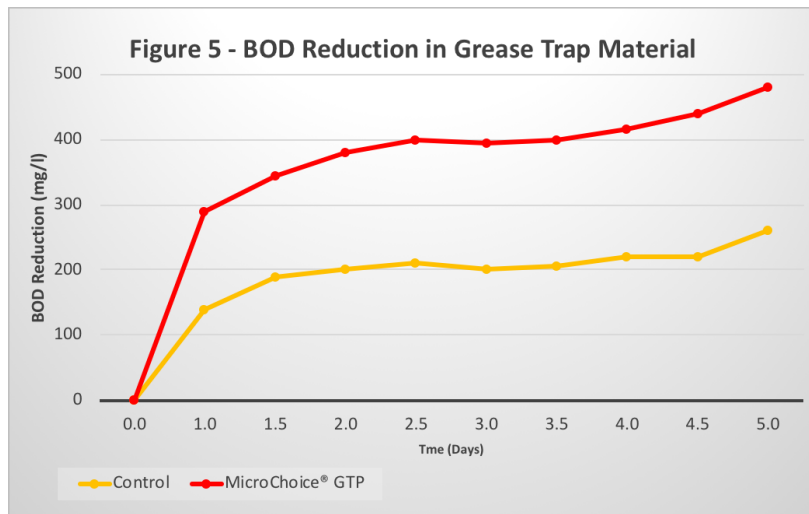
Having addressed low pH activity and FOG degradation, the next task was odor reduction. The odors associated with grease traps are often caused by volatile fatty acids (VFA's). As shown in Table 1, the seven strain blend in **MicroChoice® GTP** has the ability to degrade all grease trap associated VFA's that were tested. This includes the difficult to degrade branched VFA's, isobutyric and isovaleric acid.

**Table 1 – VFA Degradation Analysis of 7 Strains in MicroChoice® GTP**

Strain #	Acetic	Propionic	Lactic	Butyric	Isobutyric	Isovaleric
1	+	-	+	-	+	+
2	+	-	+	-	+	+
3	+	+	+	+	-	+
4	+	-	+	+	-	+
5	+	-	+	+	-	-
6	+	-	-	-	-	+
7	+	-	+	+	-	+

**BOD Reduction**

The final step in the product development process was to test the ability of **MicroChoice® GTP** to reduce Biochemical Oxygen Demand (BOD) in actual grease trap waste. To perform this study, waste was collected from a grease trap and divided into two sub-samples. One sub-sample was treated with **MicroChoice® GTP** and the other sample was left untreated. These two sub-samples were then monitored over a five-day period for changes in BOD. As demonstrated in Figure 5, **MicroChoice® GTP** showed a significant reduction in BOD during the five-day study.



**Summary**

This Product Information Bulletin describes the development of **MicroChoice® GTP**. The synergistic blend of seven bacterial strains in **MicroChoice® GTP** was selected for the following complimentary abilities: superior lipase production, the ability to function under low pH, biosurfactant production, organic waste degradation, and odor reduction (specifically volatile fatty acids). This Production Information Bulletin also describes the methodology and thought process used to develop efficacious products that solve real world problems. By understanding the issues associated with an application, and dealing with each issue using a systematic, scientific approach, we continue to develop unique biological products that work.

# MicroChoice® GTP Specifications

**Guaranteed Minimum Bacterial Concentration:**

50 Billion CFU/g

**Applications:**

- Grease Traps
- Drain Maintenance
- Septic Tanks

**Product Profile:**

**Multiple Bacillus Species**

- Naturally occurring, non-engineered
- Aerobes and facultative anaerobes
- Highly motile
- Positive chemotaxis
- 100% Stabilized bacterial spores

**Bacterial Enzyme Production:**

Amylase, Protease, Lipase, Esterase, Urease, Cellulase, Xylanase

**Appearance:**

Amber liquid

**Effective pH Range:**

4.25 – 10.0

**Effective Temperature Range:**

5°C - 55°C (40°F - 130°F)

**Shelf Life:**

One year at 21°C (70°F)

**Standard Packaging:**

Available in 50 and 100-pound fiber drums

**Custom Products:**

Contact us for alternative formulations to meet your desired specifications.

**Storage and Handling:**

Store in a cool, dry location. Do not freeze. Wash thoroughly with water if exposed to skin or eyes.

**Formulation Guidelines:**

For optimum performance, use **MicroChoice® GTP** at a 10% level in your finished product.

The information herein is true and accurate to the best of our knowledge; however, this product information sheet is not to be considered as a guarantee expressed or implied, or as a condition of sale of this product.