

# FATKING – Fats, oil and grease treatment

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

**FATKING** was formulated to breakdown animal fats and vegetable oils and has been successfully used in treating wastewater arising from food processing facilities, municipal sewerage pumping and lift stations as well as grease traps where fats and organic oils are a concern.

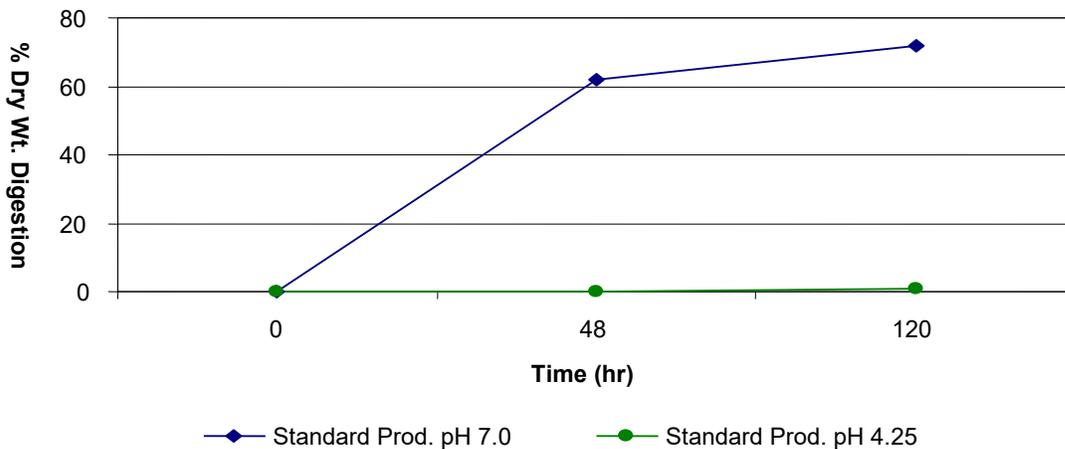
Grease applications are often the most neglected and difficult to manage problems in effluent treatment. Biological products have been used for some years in grease trap maintenance. These products reduced solids and odours, but did not perform well in low pH or high fat situations.

Understanding these limitations, Avantu R&D team has developed an improved product to address these concerns.

## Low pH Effectiveness

One major reason for grease treatment failure is the inability of standard products to function at low pH. By testing grease reduction applications in the field, and discussions with our customers, we found the majority of grease 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).

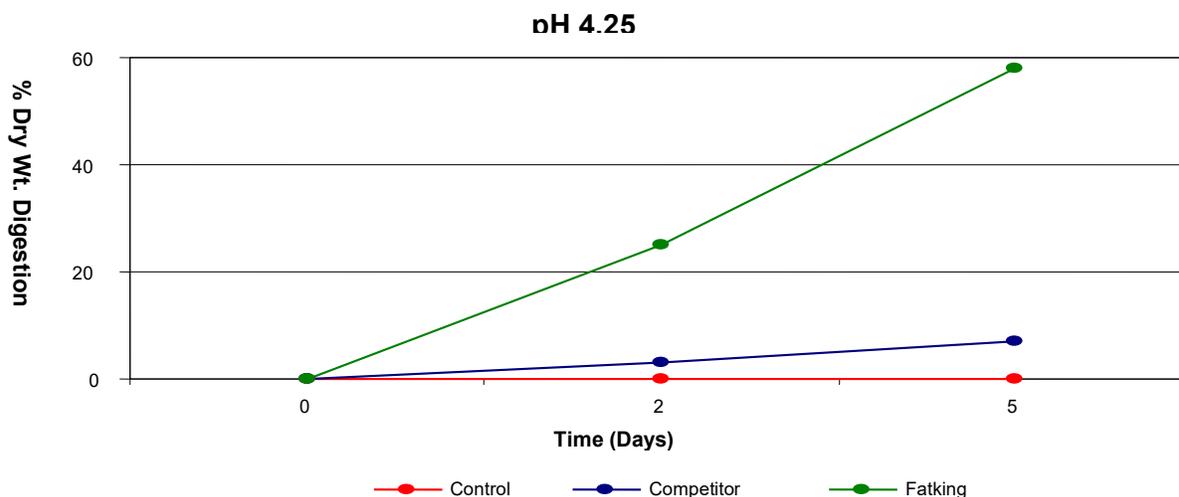
**Figure 1 - Waste Digestion Effectiveness**



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 odours at pH 4.25. These strains are included in Avantu Fatking. As shown in Figure 2, these strains significantly improve the efficacy of our products

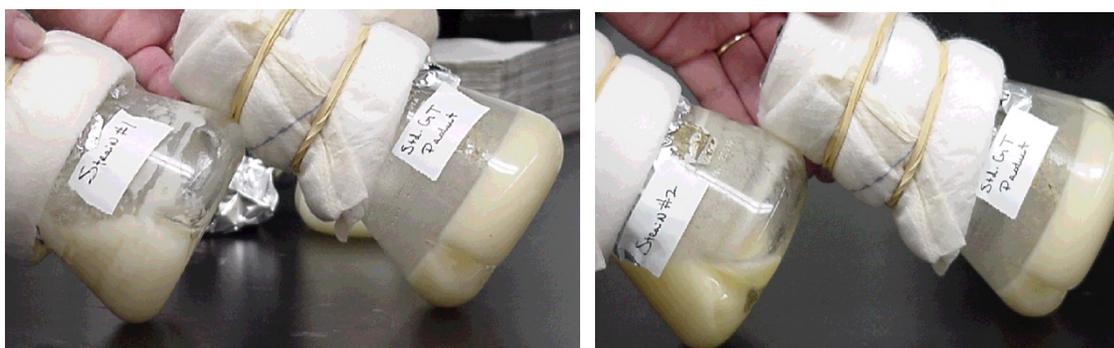
over the competition.

**Figure 2 - Waste Digestion Effectiveness**



### 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&4).

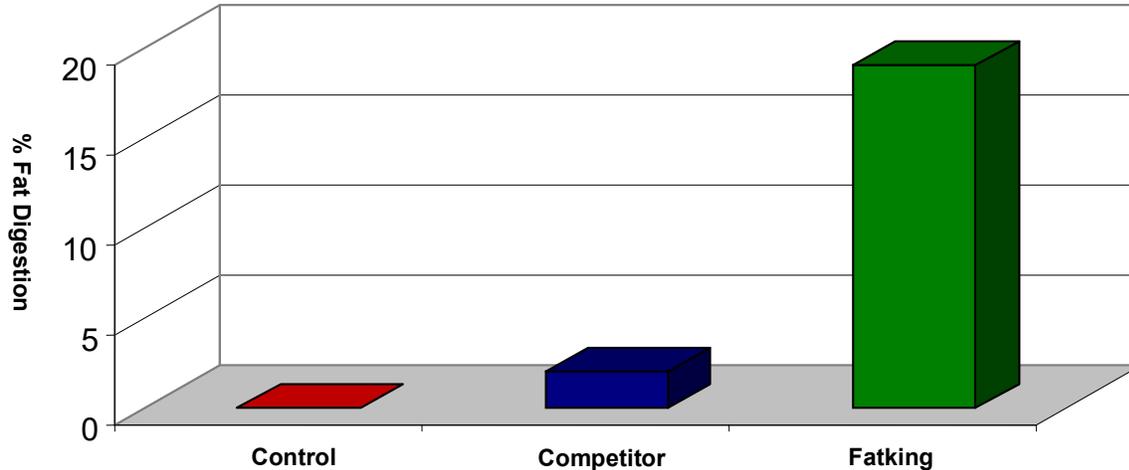


Figures 3 & 4 - Fat Degradation capabilities of two new isolates compared to a commercially available grease trap products

The isolation of these superior fat degrading strains prompted a study to investigate the ability of the bacteria in Fatking 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.

As demonstrated in Figure 4, the Fatking showed a significant improvement over the competitor's commercially available grease traps products.

**Figure 4 - Crisco Digestion - pH 4.3**



**Odour Reduction**

Having addressed low pH activity and FOG degradation, the next task was odour reduction. The odours associated with grease traps are often caused by volatile fatty acids (VFAs). As shown in Table 1, the seven strain blend in Avantu Fatking has the ability to degrade all grease trap associated VFAs that were tested. This includes the difficult to degrade branched VFAs, isobutyric and isovaleric acid.

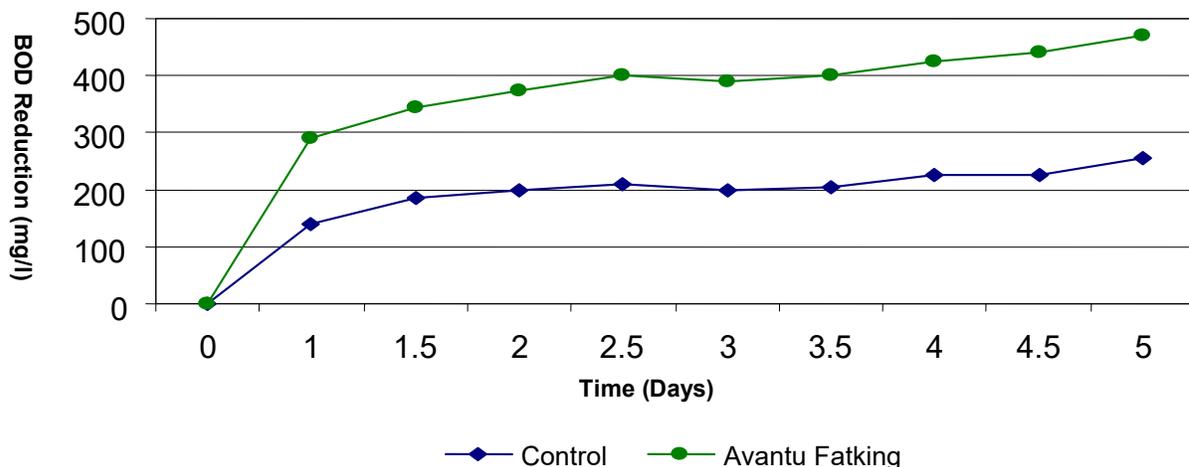
**Table 1 – VFA Degradation Analysis of 10 Strains in GT**

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 Fatking 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 Fatking 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, Fatking showed a significant reduction in BOD during the five day study.

**Figure 5 - BOD Reduction in Grease Trap Material**



### Summary

This product bulletin describes the development of Avantu Fatking. The synergistic blend of seven bacterial strains in Fatking was selected for the following complimentary abilities:

- Superior lipase production
- The ability to function under low pH
- Biosurfactant production
- Organic waste degradation
- Odour reduction (specifically volatile fatty acids).

This 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, Avantu continues to develop unique biological products that work.

### Applications

- The Fatking bacterial product was developed to target and eliminate wastes like unsaturated fat, vegetable and fish oil, milk, starch and protein in numerous industrial waste water applications.
- Grease traps and drain maintenance in restaurant kitchens, fast food outlets and hotels.
- Minimise the impact of floating oils and greases that cause operating upsets in wastewater treatment plants.

### Benefits

- Decreasing the unsightly build up of animal and plant grease and fat residues.
- Frequency of grease trap pump out is reduced which means a reduction in plumbing costs.
- Preventing the channelling, blocking and possible collapse of filter-bed media.
- Eliminates bad odours emanating from the grease receptors.



## FATKING Specifications

Guaranteed Minimum Bacterial Concentrations... 1-10 billion CFU/g dependent on the product purchased.

### PRODUCT PROFILE

#### Multiple Bacillus Species

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

#### Bacterial Enzyme Production

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

#### Appearance

FATKING - Dry, tan, free-flowing powder

#### Effective pH Range

4.25 – 10.0

#### Effective Temperature Range

5°C – 55°C (40°F – 130°F)

#### Shelf Life

Two year at 21°C (70°F)

### FORMULATION GUIDELINES

Mix drum thoroughly prior to blending. For optimum performance, use Fatking at a 10% level in your finished product.

### STANDARD PACKAGING

Available in:  
30gram sachet

### STORAGE AND HANDLING

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

### Recommended Dosages

Please request dose rates for your Avantu representative.