

# Biological Treatment of Grease Traps and Drain Lines

Grease traps and drain lines are a continuous maintenance problem for most restaurants, supermarkets and fast food locations. Greases and fats from kitchen waste are not water soluble. They float and adhere to all surfaces. As a result, grease accumulation can clog sewer lines, pumps, valves and distribution lines.

Grease traps are large volumes of water that act as collection tanks in the drain lines to significantly reduce the amount of grease that enters the municipal water system or leaching field.

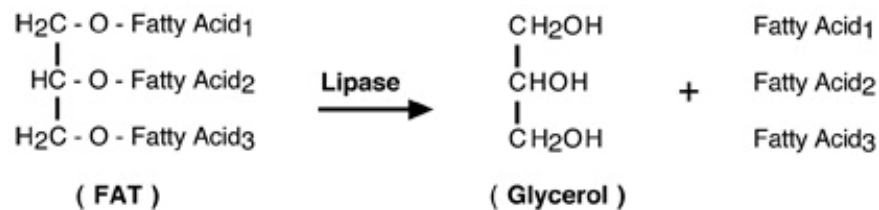
Biological treatment of grease traps and drain lines involves the application of EmTec GT. EmTec GT is a live, synergistic blend of all natural, Class I bacteria specifically chosen for their accelerated ability to metabolize greases, fats, proteins, lipids and detergents into carbon dioxide and water. These bacteria actually feed on and digest the grease and other organic material within the grease trap.

All of the microorganisms in EmTec GT were selected for their ability to produce large amounts of the extracellular enzymes that degrade proteins, starches and lipids. All organisms produce at least two and some produce all three types of enzymes. These enzymes break down the grease into a form that the bacteria can utilize as food.

## 1. FATS

Fats are esters of glycerol and fatty acids. Bacteria utilize fats only after hydrolysis of the ester bond. Extracellular enzymes, called lipases, are responsible for the reaction. The end result is the formation of glycerol and free fatty acids as shown in Figure 1:

**Figure 1**



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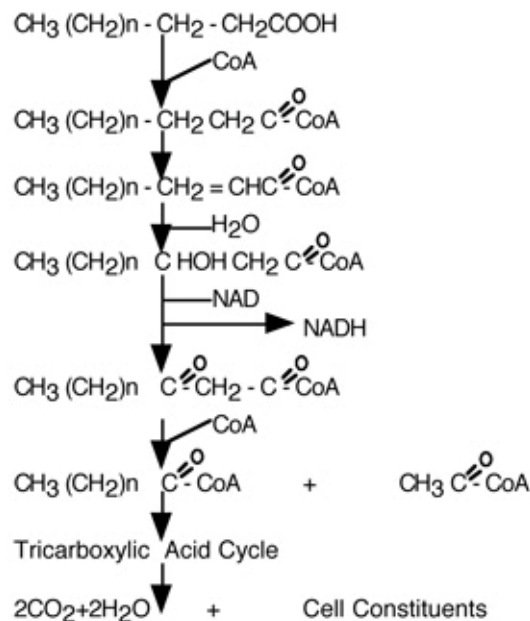
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The fatty acids released by the action of lipases are further degraded by the bacteria by a process called Beta Oxidation, in which two carbons of the fatty acid are split off at a time.

The fatty acid is first activated with CoEnzyme A. Oxidation results in the release of Acetyl Co-A and the formation of a fatty acid shorter by two carbons. The process of B-oxidation is then repeated and another Acetyl Co-A molecule is completely oxidized. The Acetyl Co-A formed is then oxidized to carbon dioxide and water by the way of the Tricarboxylic acid cycle or converted to cell constituents via the glyoxylate pathway. The glycerol is easily metabolized to pyruvic acid and then to Acetyl Co-A. These reactions are summarized in Figure 2:

**Figure 2**

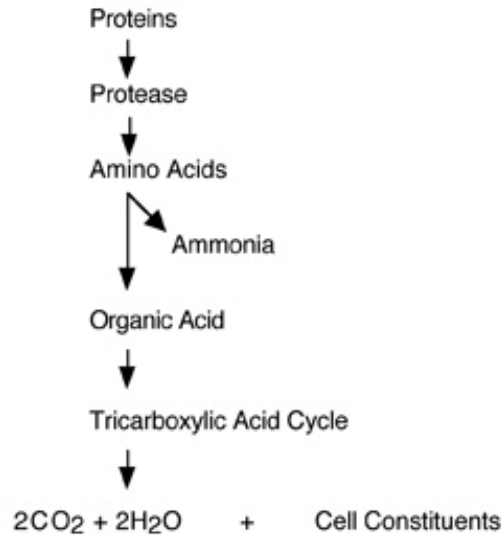


It can be easily seen that the fats are completely degraded by the bacteria. They are not merely emulsified or solubilized and sent downstream to cause problems down line.

## 2. PROTEINS

Most proteins are too large to pass through the membranes of bacteria. Bacteria produce extracellular enzymes, proteases and peptidases which degrade proteins into their component amino acids. The amino acids can be utilized for cell growth or converted into compounds that also enter the Tricarboxylic acid cycle for degradation, as shown in Figure 2. Other conversions involve decarboxylation and deamination.

**Figure 3**



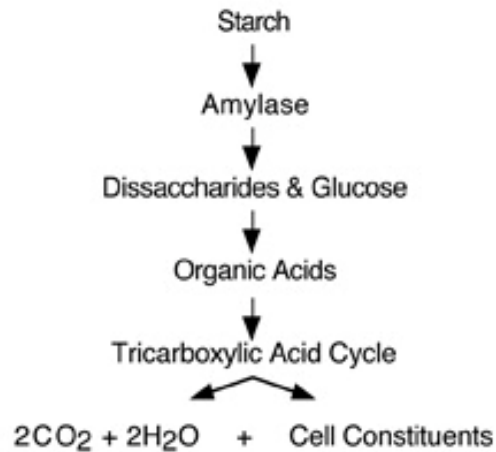
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### 3. STARCH

Starch is also too large to pass through bacterial membranes. It is hydrolyzed by enzymes excreted outside the cell. The starch is digested and disaccharides and glucose can then be converted to intermediates that also enter the Tricarboxylic acid cycle as shown in Figure 4.

**Figure 4**



This information sheet was downloaded from:

<http://www.emtec.co.th/biological-treatment-of-grease-traps-and-drain-lines.html>

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