Commercial facilities with kitchens can experience serious and costly problems related to blocked or slow drain lines and grease traps. Common problems include foul odors, backups and emergency service calls, frequent snaking or pumping, and, in some cases, fines and surcharges. Traditional treatments to address these problems involve using products that contain high levels of dangerous caustic or acid, or products that contain free enzymes and solvents that merely liquefy grease to transport problems downstream to wastewater treatment plants. The introduction of biological products has improved the effectiveness, safety and environmental profile of drain line maintenance programs. Recent innovations have exponentially increased the success of biological drain maintenance and made the technology extremely cost effective.
solvent treatments can liquefy grease blockages, some localities have banned their use since the grease can resolidify downstream, creating larger problems for municipalities. Snaking or jetting will restore flow to slow or blocked drain lines, but this can be a messy, inconvenient, and expensive process that is best avoided. Full or blocked grease traps can be cleaned by employing a pumping service, but the additional pumping associated with poorly maintained traps increases both costs and aggravation.

**Biological Drain Maintenance**

Biological drain maintenance programs use live bacteria to degrade the fats, oils and grease (FOG) and organic matter that causes problems in commercial kitchen drain lines and grease traps. Under the right conditions, certain bacteria can actually digest these contaminants and reduce them to carbon dioxide and water. Liquid and dry bacteria products have been used for drain maintenance for over 40 years. Liquid products contain a stabilized suspension of bacteria that is easy to apply using a metering pump and timer, but they contain relatively low levels of bacteria. Dry products contain much higher levels of bacteria, but must be hand fed to the drain lines and/or grease traps. A key issue with both liquid and dry bacterial products is the lag time required for the bacteria to become active. The bacteria spores used in these

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**Common Drain Line Problems**

- **Foul odors caused by decomposing food can be unpleasant to guests and employees.**
- **Slow drains and backups lead to kitchen downtime and expensive emergency service calls.**
- **Frequent grease trap pumping is expensive, leaves crusted grease behind, and does not remove buildup inside drain lines.**
- **Fines and surcharges may be levied due to increasingly stringent regulations on building discharge water.**

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**Kitchen Drain Line Problems**

Problems with commercial building drain lines typically originate in food preparation areas. Without preventative measures, grease, oil, and organic matter from sinks, dishwashers and other kitchen equipment readily build up to clog drain lines and grease traps. Grease traps are devices designed to intercept the grease and other debris from food processing wastewater prior to discharge in the sanitary sewer. They can range in size from 15-10,000 gallons. Most are designed with two chambers where the inlet to the first chamber slows the water flow so solids can settle, and free oils and greases can float to the top, creating a grease cap. The water then flows underneath the weir to the second chamber where it is discharged to the sanitary sewer. Grease traps typically require periodic pumping to physically remove accumulated grease and debris.

The reduction in drain and grease trap capacity associated with poor or ineffective maintenance can quickly translate into backups, overflows, odor issues, occupant complaints, and even fines and surcharges. Many of the approaches used to address these costly problems have limited effectiveness. Caustic and acidic cleaners can remove drain line blockages, but present serious safety and environmental hazards. Odor masking agents are expensive and only address the symptoms, while leaving the problem unresolved. Although enzyme and

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**Top of Grease Trap. Photo courtesy of Chem-Aqua.**
The development of an automated system for growing and applying high levels of active bacteria is an engineering breakthrough for biological drain maintenance.

Drain Maintenance Breakthrough

The development of an automated system for growing and applying high levels of active bacteria is an engineering breakthrough for biological drain maintenance. An onsite incubator system is now available that, over the course of 24 hours, converts pellets containing nutrients and a blend of bacteria strains (specifically selected for their ability to digest carbohydrates, proteins, and fats) into a highly concentrated soup of active drain maintenance bacteria. At the end of the 24-hour activation period, the incubator growth vessel is discharged directly to the drain line or grease trap where the bacteria immediately start consuming the grease and other problem-causing contaminants. After an automatic rinse, the growth cycle starts again.

Unlike solvents and free enzyme products, the live bacteria produced actually digest the FOG and organic contaminants that contribute to the biochemical oxygen demand of the building wastewater, converting them to carbon dioxide and water. Unlike traditional liquid or dry biological treatments, high levels of active bacteria are ready to work the moment they enter the drain system. This greatly reduces concerns associated with short retention times and pH swings, which reduce bacteria growth and effectiveness. Furthermore, automatic operation reduces labor costs and reliability concerns.

This automatic onsite incubator system uses the power of bacteria to economically solve drain maintenance problems. It effectively controls foul odors, backups and emergency service calls, frequent snaking or pumping, and even discharge fines or surcharges. With several thousand installations worldwide, this system has demonstrated remarkable effectiveness in a variety of food-service applications, as well as in food-processing-plant wastewater systems.

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