THE IMPORTANCE OF WATER TO FOOD PRODUCERS

Water is an essential natural resource for the food producing industry, as large volumes are needed to meet processing and ingredient demands. Under federal food safety laws, much of the water used by the food industry must meet stringent potable water standards.

The amount of water used by the food industry is commonly dictated, or directly influenced, by Food and Drug Administration (FDA) federal food safety laws, and U.S. Environmental Protection Agency (EPA) standards. EPA’s standards specify chemical and microbial requirements for drinking water and quality requirements for specific food products. EPA also determines water use conditions for many food industry applications. Water is used as an ingredient and as a cleaning agent for raw ingredients, processing equipment and facilities. It is also used to transfer raw ingredients, particularly in fruit and vegetable processing.

The volume of water used to produce food varies widely, and is a function of numerous factors, including the type of product, the production process used and facility size. In general, the food industry is a large industrial user of potable water. A limited survey by the U.S. food industry in the mid-1990’s indicated that water use by individual facilities ranges from thousands to multi-millions of gallons per day. Increasingly, water conservation and reuse programs are being implemented. Techniques used for conserving water include use of shutoff valves to eliminate non-critical water consumption, flow reduction devices and, where feasible, use of dry versus wet cleaning methods. Reuse of water is governed by federal food safety regulations, and numerous facilities use advanced water treatment systems to maximize “reuse-recycling” of water for processing applications. Performance measures for facility managers include the quantity of water used per unit of production. In the last few years, management compensation incentives have been linked to reductions in water use.

The need for large volumes of water by U.S. food producers creates a major waste treatment challenge. Since the mid-1970’s, EPA waste water treatment requirements, which establish legally enforceable minimum treatment requirements, apply to the food industry. These standards require effluent limits for the principal waste components of food processing, which include nutrients as measured by biochemical oxygen demand (BOD), total suspended solids (TSS), animal and vegetable fats, oils and greases (FOG) and the acid/base (pH) relationship of discharges. In addition, local or state government discharge standards are imposed on waste components such as trace metals phosphorous and nitrogen compounds. These standards vary and are in response to the conditions of local receiving waters. Under revised federal regulations, it is expected that food facilities will be required to meet even more stringent waste water discharge and treatment standards in the next 10 or 20 years.

The vast majority of food facilities discharge wastewater to municipal wastewater treatment plants that in turn discharge to the environment after various contaminant treatments are applied. Publicly Owned Treatment Works
(POTW) treatment of food waste is in addition to any other treatment performed by food producers. Many U.S. food-producing facilities are often required to have some form of onsite wastewater treatment, whether the discharge is direct to the environment or indirect to a municipal treatment plant. Treatment options range from elimination of solids, to technologically advanced secondary and tertiary treatment. It is not uncommon for food facilities in the U.S. to treat incoming water to meet specific quality standards and operate treatment systems that result in a wastewater discharge that is of a higher quality than the incoming water.

Industry investment and improvements in water treatment have and continue to be substantial. Further, wastewater treatment currently is and can be expected to remain a costly and technology driven activity for the food industry. For example, the cost to construct a full-scale individual facility treatment plant has been reported in excess of $2 million, with annual operating costs in the hundreds of thousands of dollars.