

Essential Hygienic Design



Introduction

Increasing demand for processed foods means there's often little or no heat treatment on foods – increasing the risk of microorganisms that would usually be killed in cooking. This means that hygiene in the production of processed foods is more essential than ever to avoid food contamination.

Stringent hygiene standards are essential in the food and beverage industry to ensure that products are fit for human consumption. Common hygiene risks in food processing include microorganisms (bacteria, viruses, parasites and moulds), chemical residues (from cleaning and sanitising agents) and physical foreign matter.



“The global market for food processing machinery is estimated to reach US \$45 billion by 2018.”



Cleanliness Food Processing

The demand for processed food across the geographies has created a greater need for automated machinery in the food processing industry, with the global market for food processing machinery and equipment estimated to reach US \$45 billion by the year 2018 [1].

Automated machinery is essential for food processing as it can assist in reducing costs, improving quality, increasing productivity and addressing workplace health and safety; but it does create hygiene risks. Machinery has a greater surface area one which micro-organisms, chemical residues

and physical foreign matter can collect, and some parts of machines are hard to reach to clean, creating a breeding ground for bacteria.

Most bacteria grow at temperatures between 5°C and 63°C, commonly referred to as the 'danger zone' and have an optimum temperature of 37°C. Only temperatures above 70°C for at least 2 minutes will kill bacteria, meaning very high temperatures are needed in the cleaning process to ensure the area is bacteria-free and clean [2].

Consequences

Food borne illnesses force 1.2 million people to visit the doctor each year– putting a major strain on health services and businesses alike [3].

Food contamination often results in product recalls; in October 2012, Woolworths had to recall their 750g bag of Almond Kernels due to the potential presence of Salmonella contamination [4]. Also, McCain Foods Pty Ltd recalled their Family Pizza Cheese and Bacon in June 2011 for a possible metal contamination [4].

Food contamination needs to be avoided at all costs as not only can it cause serious health problems for the customer, the company can face major prosecution. An Italian restaurant in Victoria was fined \$60,000 after a customer choked on a piece of wire that had become lodged in the crust of the pizza he was eating. The customer was forced to undergo emergency surgery and spent several days in hospital and the restaurant's reputation was tarnished [6].

Hygienic Design

Hygienic design in food processing factories is essential in all stages of the production process. All parts of the production line should be cleanable, and not just a wash-down; equipment must be able to withstand a high-pressure wash of over 100 bar pressure and temperatures over 77°C in addition to resistance against harsh cleaning agents.

Organisations like EHEDG and HACCP strive to promote safe food by improving hygienic engineering and design and monitoring processes in all aspects of food manufacturing. EHEDG is a European governing body whose standards and design criteria have been adopted worldwide. They

are a group of equipment manufacturers, food industries, research institutes and health authorities who promote safe food by improving hygienic engineering and design in all aspects of food manufacturing.

HACCP is a preventative approach to identifying hazards in the manufacturing, processing and sale of food and beverages. With the HACCP approach, procedures are to be established for detecting, documenting, eliminating, and following-up health hazards. Every machine builder or manufacturer must create their own HACCP system.



“Processing equipment must be able to withstand over 100 bar pressure and temperatures in excess of 77°C.”

Solution

SICK is a market leader in sensors and system sensors for industrial applications, one industry in particular being the food production industry. Presence detection sensors are an integral part of the food production process as they let the machines know at what stage the process is at, alleviating the cost of manpower.

What sets SICK sensors apart from the rest is that they remain functionally reliable, even in exposed areas, through high pressure cleaning using extreme temperatures. Temperature fluctuations and high steam temperatures have no effect on

their functioning, meaning they'll stay sealed and strong. SICK sensors can also withstand aggressive cleaning and disinfectant agents – such as alkaline products or some products containing chlorine; these agents are generally demanding on sensors, but SICK sensors are unaffected, even in the long term.

SICK presence detection sensors, which adhere to EHEDG and HACCP standards, are a step forward in hygienic design in the food processing industry that aids in the reducing bacteria growth and contamination in the industry.

- [1] Food Processing Machinery and Equipment - A Global Strategic Business Report, May 2012, Global Industries Analysts, Inc:
http://www.prweb.com/releases/food_processing_machinery/meat_poultry_processing/prweb9504006.htm
- [2] <http://archive.food.gov.uk/hea/teachers/plainenglish/part2.html>
- [3] OzFoodNet (Department of Health & Ageing), Foodborne illness in Australia: Annual incidence circa 2000
- [4] <http://woolworths.com.au/wps/wcm/connect/website/woolworths/about+us/product+recalls/food+recall+woolworths+almond+kernels+750g>
- [5] <http://www.recalls.gov.au/content/index.phtml/itemId/1004770>
- [6] <http://www.haccp.com.au/news-article.php?newsid=21&pos=1>



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