

Chlorination For Poultry And Meat Processing



Introduction

Research and experience have established that quality of food products depends directly upon the sanitary practices of a processing plant. Products that have been excessively contaminated are considered to be of a low sanitary quality, and pose a health hazard. Superior sanitary control results in products that are cleaner, more healthful, look better, have a longer shelf life and greater selling potential.

Since much of the poultry and meat processing involves moving the product on conveyers and human contact, provisions must be made to keep both the equipment and personnel sanitized.

Chlorine is one of the most widely used chemicals for sanitation in the food processing industry. Advantages of using chlorine include:

- Kills Bacteria
- Controls Slime and Algae
- Increases Product Shelf Life
- Eliminates Costly Hand Cleaning Labor and Materials
- Treats Water for Sterilization and Washdown
- Treats Chilling Water
- Treats Plant Wastes

Chlorine is available in several forms: gas, liquid, and powder. The choice is usually dependent upon the volume of water to be treated, the amount of disinfection required, and the area in which the chlorine will be used.

Chlorine gas is considered the best choice where large volumes of water are to be chlorinated at high levels (4-5 ppm). Chlorine gas is pure 100% available chlorine, it lowers the pH slightly, and is easy to control and apply. Economically, it is the least expensive source on the basis of available chlorine.

Hypochlorites (calcium and sodium) are second in choice because chemical by-products such as calcium chloride and sodium chloride may have an adverse effect on the quality of the product. The chemical dosage is also difficult to control. Hypochlorites raise the pH of the water, which in hard water, may cause

deposits on equipment. Hypochlorites are more sensitive to organic matter in water resulting in a faster loss of germicidal power. Being unstable, hypochlorites are difficult to store and deterioration results during storage. Based on the available chlorine content, hypochlorite is expensive.

Hypochlorites are a good choice, however, when only small amounts are needed, such as localized germicidal application for clean-up and preventing slime formation on belts and other equipment.

Poultry Processing

A typical poultry processing operation, shown in Figure 1, indicates areas requiring chlorination.

The birds are first hung on a conveyer or line. The slaughtered birds pass through a tunnel to give sufficient time for the blood to completely drain. The tunnels are continuously washed with chlorinated water to maintain bacteria counts at acceptable levels.

The birds then enter a hot water scald tank made up of troughs and flumes to keep the birds totally submerged. The birds then pass through a series of picking or roughing machines which knock off most of the feathers, then on to the pinning area, where the remaining feathers are removed by hand. Pinners wash their hands with chlorinated water to reduce odors and bacteria count. After pinning, the birds go through a singer to remove the remainder of hair and feathers.

The birds are then conveyed to the outside washer which consists of a series of water sprays and is used to wash all foreign material from the carcass. Next, is the removal of some internal organs. Each bird is then inspected for signs of disease. Following inspection, the giblets (heart, liver, and gizzard) are removed and sent through for more processing. The remaining organs are sent to waste.

CAPITAL CONTROLS

An inside-outside washer cleans and disinfects the inside of the carcass with a flowing stream of chlorinated water and the outside with chlorinated water sprays. Meanwhile, the giblets are trimmed and washed in a flowing stream of chlorinated water, packed in a giblet bag and returned to the body cavity.

The whole bird is now removed from the conveyer, weighed and classified. The birds are placed in chill tanks for 3 to 6 hours, to quickly bring their internal temperature to between 35° and 38° F (2° and 3°C).

The chilled birds are removed from the chill tank and hung on a drying conveyer, then ice packed. The container is sealed and will stay cold for 2 or 3 days during shipment.

In some plants, the birds are further processed by being cut up into parts. Parts are packaged and shipped frozen or ice-packed.

Meat Processing

Meat and poultry processing is similar. After being slaughtered, the carcasses are hung and sprayed with chlorinated water. When the hide has been removed, the carcass is again washed with chlorinated water to eliminate any new bacteria that may be present.

As the carcasses are butchered, the meat is transported on conveyer belts. The belts are an ideal breeding ground for bacteria and require continuous washing with a highly concentrated chlorine solution. The meat may be further processed or cooked, depending upon the final end product, or be shipped in bulk to other processing plants.

Typical Chlorination Rates:

Belt Washing	50 ppm
Washdown Hoses	50 ppm
Hand Washers	5-10 ppm
Flushing Troughs	5-10 ppm
Carcass Spray	
Washers or Dips	50-100 ppm
Final Chilling	5-10 ppm

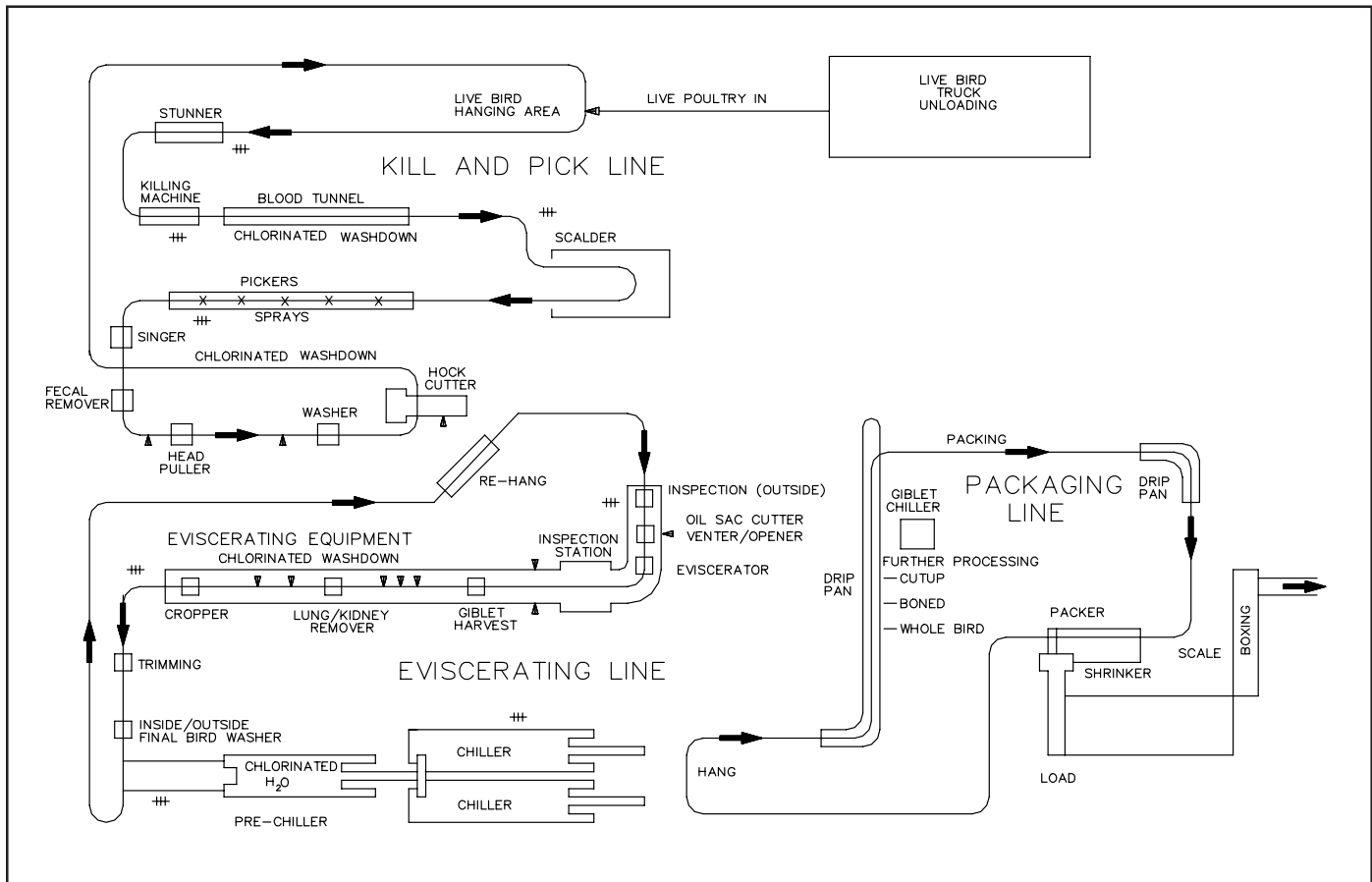


Figure 1 - Typical Poultry Process

Summary

Capital Controls Company can provide several equipment options from individual components to a complete system. In addition to gas chlorination, Capital Controls can design a disinfection system using

ultraviolet light or chlorine dioxide. To ensure process and discharge water quality, Capital Controls offers instruments for chlorine residual, pH/ ORP, Temperature, Conductivity, and Dissolved Oxygen monitoring.

For personnel protection, Capital Controls offers a complete line of chlorine, and other type of gas detectors.

Design improvements may be made without notice.

Represented by:



CAPITAL CONTROLS

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