

Sanitation and Handling Practices for Fresh Meat Retailers

► Meat sanitation practices reduce spoilage and provide a longer product shelf life. Learn processes to prevent contamination and enhance retail profits.

Studies have shown that meats processed using proper sanitation techniques and stored at holding temperatures below 32 degrees F after packaging can have a shelf life of 1 week and maintain meat color. Following these practices also promotes a healthy, clean environment, which enhances a retailer's reputation and leads to more sales and reduced labor costs.

Causes and Prevention of Meat Contamination

The color of freshly cut meat is purplish red. After it is cut, meat "blooms" by absorbing oxygen from the air, turning it bright red. Continued exposure to air causes the meat to turn brownish red or grayish red.

The length of time between initial blooming and discoloration depends on several factors. Among these are the presence of oxygen from the air and dehydration or loss of water from the surface. Both of these factors are controlled by the use of proper packaging materials. Fresh meat packaging films permit oxygen to enter the package and act as a barrier to moisture loss.

Microbes and temperature are two other factors that must be controlled by practices and operations in the retail market. The most important cause of discoloration is the action of microbes (bacteria, molds, and yeasts) growing on the cut surface. Muscle, fat, and bone in a living animal are practically free of microbes. It is during slaughtering, handling, cutting, and packaging that the meat becomes contaminated. Many of the microbes of concern in meat processing grow at refrigeration temperatures. They cause spoilage but generally are not the cause of sickness. While bacteria, molds, and yeasts may be found on meat, bacteria are more common because they grow faster on moist meat surfaces.

Temperature has a marked effect on the growth of all microbes. The generation time (time to double in numbers) of microbes commonly found on meat is around 6 hours at 40 degrees F but 20 hours at 32 degrees F. An increase in temperature of 8 degrees F



will permit the organisms to grow three times faster. This means that steaks beginning with 100 microbes per square inch would have around 800 microbes per square inch if displayed for 2½ days at 32 degrees F as compared with 51,200 if displayed at 40 degrees F.

Proper Processing, Displaying, and Handling

Meat received in the retail store from the packer has been through considerable handling. This handling, coupled with the time lapse between slaughter and receiving, may contribute to varying amounts of surface contamination. Wholesale beef cuts frequently are more contaminated than quarters because they have been handled more. Contamination may easily be passed from the surface of the wholesale cuts to the surface of the unscrapped retail cut during cutting.

Processing Guidelines

Plan your work so that meat remains in the cutting room for a minimal amount of time; use 20 minutes or less as a goal. If the processing room is not refrigerated, do as much work as possible in the cooler.

To reduce the level of contamination, pretrim meat prior to cutting. Trim off any bloody ends or discolored meat as soon as possible to prevent further spoilage.

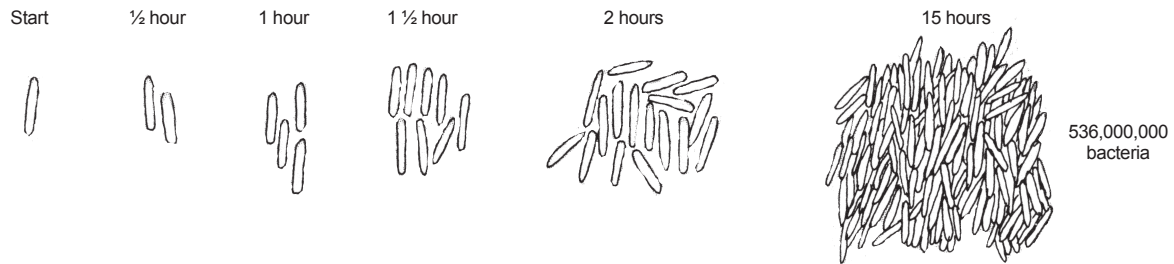


Figure 1. Typical Bacteria Growth

First remove and quickly process cuts such as flank, kidney, neck, skirt, and other parts of the carcass that frequently have a high level of contamination. Cross-contamination can be avoided by working only one type of commodity at a time. Process trimmings as they accumulate and do not hold them for an extended period of time.

Maintain the processing and wrapping area below 55 degrees F. At higher temperatures bacteria will multiply extremely fast on retail cuts and processing equipment. Quickly process, package, and place products in refrigerated display cases. Evenly distribute workloads between cutters and wrappers so that packages do not accumulate on the wrapping line for longer than 20 minutes.

Display Case Guidelines

Maintain display cases at 29 to 32 degrees F and the internal temperature of the product as close to 32 degrees F as possible. If display cases are overloaded, temperatures may reach 50 degrees F. Overloading also may cause products on the bottom to freeze.

When using single-deck cases, adjust the shelf so that products are within the refrigerated area. Do not stack items more than three high. On high-volume days, restock the case frequently rather than overload. With multi-deck cases, the height to which a product can be stacked is limited to the space available between shelves.

Because of the placement of thermometers in retail cases (usually in the back of the case) the temperature recorded may not apply to the entire case. Check temperatures at least twice daily for proper levels and install two recording thermometers if possible. Flowing juices are a sign that the temperature is too high.

Cover display cases at night. If the store is closed over weekends, remove all meats from display cases and hold in the cooler.

General Handling Guidelines

- Remove meat from the delivery vehicle as quickly as possible. The optimal temperature for the receiving area is 30 to 32 degrees F.
- Remove fresh meats from boxes and place on cooler storage racks and hang rail meat on clean hooks. Store at 30 degrees F and space so that air circulates freely around the meats.
- Do not reduce air flow by overloading meat hooks or hanging meat so that it rests against the wall of the cooler.
- Avoid stacking and overloading in cooler space. Generally, 3½ square feet of cooler space per foot of linear display space is recommended.
- Keep the cooler door closed tightly except during entry and exit.
- Move meat products from the cooler to display cases as rapidly as possible.
- Set defrost cycles for times when the store is not open for business. Depending on the equipment used and temperature of the store (i.e., sales area is around 72 degrees F), it may be necessary to have three defrost cycles.
- Avoid frost buildup on equipment and keep all cold air passages free from obstructions.
- Do not permit meat to sit in the cutting room during employees' breaks and lunch periods.
- Do not stack prepackaged meat immediately after packaging. The heat-sealing process will raise the temperature of the meat and hasten discoloration.
- Never stack meat or primal cuts in push carts for storing in the cooler.
- Never display canned hams above the chill line of cases or stack them in the aisles where there is no refrigeration.

Sanitizing Food Handling Facilities and Equipment

All food processing equipment and facilities must be cleaned and sanitized to maintain a satisfactory shelf life of perishable foods. The purpose is to remove the food (nutrients) that bacteria need to grow and to kill those bacteria that are present. Cleaning removes the nutrients and sanitizing kills the bacteria. When this is coupled with cold temperatures and dry surfaces, bacterial growth is not a problem because the three essentials for bacterial growth—food, moisture, and lower temperatures—have been removed.

Management must recognize that good sanitation is costly. It requires time, labor, and proper materials. In most store processing and packaging areas, at least 1 hour of each 8 is necessary for cleanup. For some food processing plants, this may be 10 to 20 percent of the total working time. It is especially high for single-shift operations.

Personnel must be trained to clean and sanitize facilities and equipment. It is not something that most of us like to do, thus the least experienced people usually are assigned the task of cleaning. The opposite should be the case where perishable foods are involved. The most experienced people should clean and sanitize equipment.

Equipment and Cleaners

The necessary equipment and materials for cleaning must be available. This includes pails, brushes, scrapers, cleaners, sanitizers, and a high-pressure washer. Don't use cloths or sponges for washing. They provide little scrubbing action and contaminate surfaces with bacteria since they don't usually dry between uses. Bristle brushes should be used. Avoid metal sponges and scouring pads as these scratch metal surfaces, which makes cleaning more difficult.

The primary source of soil left on equipment is from the food that was handled. However, minerals from the water and residues from cleaning compounds can contribute to films left on equipment. Sugars and starches are quite easily removed. Protein, fat, and minerals, however, are not soluble in water and are more difficult to remove. Alkaline cleaning materials are used for removing fat and protein from surfaces. Alkaline materials emulsify, saponify, and peptize these

protein and fat deposits. This breaks them up so that they combine with water, causing a chemical action that places insoluble soils in a colloidal solution. Cleaners also function to provide good penetration, rinsing, and softening of hard water.

Alkaline cleaners in solution give pH readings between 8 and 11. The higher the reading the stronger the alkaline solution. Acid cleaners are not commonly used in stores. In food processing plants with closed systems, acid cleaners are necessary to prevent mineral deposits. The pH readings of these solutions would be 4 to 6.

When possible, let hand tools soak for 5 minutes. This provides time for the alkaline cleaner to work. Rinse all surfaces with clear water. This removes the alkaline solution and permits more effective sanitizing.

Cleaning does not remove all the bacteria. Therefore, chemical sanitizing of all food contact surfaces is necessary. Use either chlorine or iodine compounds at strengths of 100 to 200 ppm and 12 to 25 ppm, respectively. Chlorine is less expensive and readily available as bleach; however, it is irritating to skin and corrosive to metal surfaces. Iodine compounds are much less corrosive and less irritating to skin. To be sanitized, surfaces must be clean. Contact time of at least 30 seconds is necessary.

Put equipment on racks to drain, if possible. With a clean rubber scraper, remove excess moisture from surfaces that will not drain.

High-pressure washers should be available in all stores. They can be used to wash stationary equipment, ceilings, walls, and floors. Equipment, tables, and floors in packaging rooms should be washed daily. Proper-strength solution and adequate temperature and pressure are necessary for high-pressure cleaning. Use one-step cleaning/sanitizing only for nonfood product contact surfaces such as walls, ceilings, floors, coolers, and display cases.

Cleaning Frequency

Facilities and equipment must be cleaned and sanitized on a regular schedule. Hand tools, dishes, and table surfaces must be cleaned and sanitized daily. Never handle raw then processed foods without thorough cleaning and sanitizing. Handle products in separate areas if possible. Keep fruits, vegetables, dairy, and delicatessen products away from raw meat, fish, and poultry.

Clean coolers and display cases weekly or as needed. When they become dirty, clean them. Frozen food cases may be cleaned as infrequently as four times a year. If containers leak or are broken and food spills, clean the area immediately. Consumers are aware of unclean conditions in stores, and lack of clean facilities affects sales volume.

Cleaning Steps

Local, state, and federal regulations related to food handling and quality are increasing. To prevent regulatory action and negative publicity, sanitary facilities and practices are necessary. A seven-step process is commonly used for manual cleaning of hand tools, equipment, and facilities in the meat or delicatessen preparation areas:

1. Dry clean the area, picking up all scraps of meat, paper, etc.
2. Scrape equipment with a rubber scraper to remove as much contamination as possible.
3. Rinse all surfaces with lukewarm water of about 100 to 120 degrees F.
4. Wash surfaces with an alkaline solution and brush.
5. Rinse surfaces with hot water of about 180 degrees F.
6. Sanitize surfaces with a chemical solution.
7. Let surfaces drip/air dry or remove excess water with a clean rubber scraper.

Loose food particles must be removed as the initial step in cleaning. Use a rubber scraper to do this. Metal or abrasive tools scratch surfaces, making them more difficult to clean. All surfaces should be made of metal or other similar material for easy cleaning. Wooden or porous plastic surfaces are unacceptable. Stainless steel is the most sanitary.

Rinsing equipment soon after use makes cleaning much easier, especially with foods that dry on the surface. Do not use hot water before using the detergent since it will denature the protein and cook it on the surface. Water at about 100 degrees F melts fat and removes it.

For hand tools, use a three-compartment sink. After rinsing, fill the second compartment with water at about 120 degrees F. Measure the water and add the proper amount of cleaner for the volume of water. Don't use perfumed cleaners or those with disinfectants as they may cause odors or tastes in food.

Commercial companies can advise you on products and procedures for all of your facilities and equipment. Follow their directions. If you have cleaning problems, contact their technical representatives for assistance.



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