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§ 1200. Definitions.

(a) As used in this subchapter, unless otherwise required by the context, the singular form shall also import the plural and the masculine form shall also import the feminine, and vice versa. For the purpose of these regulations the following words, phrases, names, and terms shall be construed respectively to mean:

(1) Ante-mortem Inspection. Examination of live poultry before slaughter to detect conditions that might render the poultry unwholesome.

(2) “Area Supervisor” means an official employed by the Department in charge of a specified geographical region in California.

(3) Branch. The Meat, Poultry and Egg Safety Branch of the California Department of Food and Agriculture.

(4) Branch Employee. An employee of the Meat, Poultry and Egg Safety Branch, of the California Department of Food and Agriculture, who is authorized by the Branch Chief to do any work or perform any duty in connection with plant sanitation or poultry meat inspection.

(5) “California Condemned” means that the poultry so identified has been inspected by an inspector and found to be in a dying condition, or to be affected with any other condition or disease that would require condemnation of its carcass or its affected parts.

(6) “California Inspected and Passed” means that the poultry product so identified has been inspected by an inspector and passed under the regulations in this subchapter, and at the time it was inspected, passed, and identified, it was found to be not adulterated.

(7) “California Rejected/Retained” means the Red or Green State of California Rejected/Retained tag and used as follows:

(A) When the Rejected box of the Red or Green tag is checked, it indicates that the compartment, room, utensil, or piece of equipment so identified is unacceptable for use in the official establishment and cannot be used until the condition that renders it unacceptable is corrected.

(B) When the Retained box of the Red or Green tag is checked, it indicates that the meat or poultry meat or meat or poultry product so identified is unacceptable for use in the official establishment and cannot be used until the condition is corrected.

(C) Only authorized employees of the Department of Food and Agriculture can release or remove the Red California Rejected/Retained tag; the Green California Rejected/Retained tag may be detached only by a Livestock Inspector, Poultry Meat Inspector, or an authorized employee of the Department of Food and Agriculture.
(8) "California Suspect" means that the poultry so identified by an inspector is suspected of being affected with a disease or condition which may require its condemnation, in whole or in part, when slaughtered, and is subject to further examination by a program employee to determine its disposal.

(9) **Condition.** Any state, including, but not being limited to, the state of preservation, cleanliness, or soundness of any product; or any circumstance, including but not limited to, the processing, handling, or packaging that affects such product.

(10) **Department.** The California Department of Food and Agriculture.

(11) **Dressed Poultry.** Poultry that has been slaughtered for human food with head, feet, and viscera intact and from which the blood and feathers have been removed.

(12) **Edible Poultry By-products.** Any giblets or any edible part of dressed poultry other than eviscerated poultry.

(13) **Free From Protruding Pinfeathers and Hair.** Pinfeathers and vestigial feathers (hair or down as the case may be) have been removed so that the carcass is free from protruding pinfeathers and vestigial feathers that are visible to an inspector or Branch employee during an examination of the carcass. However, a carcass may be considered as free from protruding pinfeathers or vestigial feathers if it has a generally clean appearance (especially on the breast) and if not more than an occasional protruding pinfeather is in evidence during a more careful examination of the carcass.

(14) **Giblets.** The liver from which the bile sac has been removed, the heart from which the pericardial sac has been removed and the gizzard from which the lining and contents have been removed: provided, that each such organ has been properly trimmed and washed.

(15) **Immediate Container,** or True Container. The unit, can, pot, tin, or other receptacle or covering in which any poultry meat or product is customarily packed or shipped.

(16) **Inspected for Wholesomeness Under Supervision of the California Department of Food and Agriculture, California Inspected and Passed, or Any Authorized Abbreviation Thereof.** That the poultry or poultry meat, poultry meat products, or poultry meat food products so marked have been inspected under these regulations, and that at the time they were inspected and so marked they were free from:

(A) Physical evidence of disease injurious to human health;

(B) Pathological conditions that have rendered or would render the poultry meat unsuited for human food;

(C) Serious destruction of the flesh by disease or injury; or
(D) Contamination by any substance injurious to human health.

(17) **Inspection Mark.** A mark or statement, authorized by these regulations, on a product or on the container of a product, indicating that the product has been inspected for wholesomeness by an inspector.

(18) **Inspector.** A Department employee employed as a Veterinarian (Meat Inspection), Meat Food Inspector, Supervising Meat Food Inspector, or Chief of the Meat, Poultry and Egg Safety Branch, or an industry-employed and Department-licensed Poultry Meat Inspector.

(19) **Label.** This term applies to any display of written, printed, or graphic matter upon any article or any of its containers or wrappers, or accompanying such article.

(20) **Major Reconstruction.** Major reconstruction shall be construction other than that associated with normal or routine maintenance activities.

(21) **Mislabel.** Means the placing, or presence of any false, deceptive, or misleading mark, tag, brand, design, inscription, statement, billing, invoice, placard sign, or other descriptive designation.

(22) **Official Plant or Establishment.** Any premises licensed by the Department where poultry is slaughtered or otherwise prepared for food purposes and where state inspection is maintained under these regulations.

(23) **Potable Water.** Water which is free from disease producing organisms and injurious chemicals. It does not possess obnoxious tastes or odors, and is not turbid or colored to a degree that it is rendered repugnant to the consumer. Standards of tests to be used in determining potability shall be the same as the standards of the National Primary Drinking Water Standards, 40 CFR Part 141, sections 141.1, 141.2, 141.3, 141.4, 141.5, 141.6, 141.11, 141.13, 141.21, 141.22 and 141.23 (2007), which are incorporated by reference.

(24) **Poultry.** Domestic fowl and domesticated rabbit to be used for human food. “Fowl” includes chickens, turkeys, ducks, geese, guineas, squab, quail, pheasant, ratites, and other domesticated birds.

(25) **Poultry Meat Food Product.** Any article of food, or any article intended or capable of being used as human food that is derived or prepared, in whole or in substantial and definite part from any portion of poultry.

(26) **Producer** means a person who is engaged in the business of growing any poultry, which is marketed as poultry meat, for a period of three weeks or more for the purpose of increasing the size and weight of such poultry.

(27) **Product.** Dressed poultry, ready-to-cook poultry, edible poultry by-product and poultry meat food product.
(28) **Ready-to-Cook Domestic Rabbits.** Any domestic rabbit that has been slaughtered for human food, from which the head, blood, skin, feet, and inedible viscera have been removed, that is ready to cook without need of further processing, or any cut-up or disjointed portion of such domestic rabbit.

(29) **Ready-to-Cook Poultry.** Any dressed poultry that is free from protruding pinfeathers, vestigial feathers (hair or down as the case may be), and from which the head, shanks, crop, preen gland, trachea, esophagus, entrails, reproductive organs and lungs have been removed, and with or without the giblets, is ready to cook without need of further processing. Ready-to-cook poultry also means any cut-up or disjointed portion of poultry prepared as described in this paragraph.

(30) **Regulations** or These Regulations. Regulations contained in Subchapter 1, Chapter 5, Title 3, of the California Code of Regulations.

(31) **Retained** for Further Inspection. That each carcass, including all parts thereof so marked or identified, is held for further examination by an inspector or Department employee to determine its disposition.

(32) **Shipping Container.** The box, bag, barrel, crate, or other receptacle or covering inclosing any product packed in one or more immediate or true containers.

(33) **Soundness.** Freedom from external evidence of any disease or condition that may render a carcass unfit for food.

(34) “**Wholesome**” means any poultry meat food product fit for human consumption.

(35) For purposes of section 24713, Food and Agricultural Code, the term “**immediate family**” means producers, their spouses, children, brothers, sisters and parents. Other relatives of the producers by blood or by law will be considered as qualifying if they reside on the same property as the poultry operation or property that is contiguous to that property.

§ 1201. **Applicability of Regulations.**

Unless inapplicable, the provisions of these regulations shall apply equally to domesticated fowl and domesticated rabbit used for human food.
FOREWARD
On July 1, 1956, California became the first state in the union to require that all poultry and poultry products sold, or offered for sale, within its borders be processed in sanitary plants, in a sanitary manner, and be inspected for any disease or condition that might render it unfit for either human or animal food.

The primary purpose of the legislation requiring inspection is the PROTECTION of THE HEALTH OF THE PUBLIC. To this end, the Secretary of the California Department of Agriculture is charged with the enforcement of the law and the regulations declared there under. The Secretary discharges this duty through the Meat, Poultry and Egg Safety Branch (MPES) and through a body of Poultry Meat Inspector (PMI) licensed by the State of California to act as inspector in plants exempted by the Federal Poultry Products Inspection Act and not exempted by the California Food and Agricultural Code.

The Meat, Poultry and Egg Safety Branch, through its Veterinary Medical Officers provides assistance, advice, training, and necessary supervision to each PMI in carrying out their duties. State licensed Poultry Meat Inspectors are employed and paid by poultry plants to carry out the mandate of State law requiring the inspection of poultry and poultry products.

How well these licensed Poultry Meat Inspectors have met their responsibilities in the protection of the health of the public since the beginning of the inspection program can be attested to by figures supplied by the California Department of Public Health. In 1956, the year inspection began, 40 percent of all reported outbreaks of food poisoning in California were attributed to poultry or poultry products. By 1958 this figure had dramatically dropped to 13 percent.

Each Poultry Processing Operation desiring to operate under CDFA inspection must be approved and licensed by CDFA. At least one licensed Poultry Meat Inspector must be on the plant premises during poultry harvesting operations to ensure that all State requirements are met.

The information in this manual has been compiled to assist the PMI applicant to become licensed and to operate effectively as a Poultry Meat Inspector. While it does not cover every detail that may be encountered in the day-to-day work of inspection, it provides a foundation for Poultry Meat Inspectors to work from and a reference to be used in the course of their duties. Department will provide training material and training assistance needed to clarify some topics to prepare applicant to obtain knowledge to pass license written and oral/practical exams.

The examination is based on the California Food and Agricultural Code and the regulations declared there under, together with the information found in this manual. Any other information, training, or assistance needed by the applicant will be furnished by a Branch employee.

After successfully passing the examination and following licensing, inspectors are subject to continuous training in the performance of their duties as Poultry Meat Inspectors. Annual Maintenance Training (AMT) sessions are provided by the Branch and each Poultry Meat Inspector (PMI) is required to complete one of these training session as a condition of maintaining PMI's license.
The information contained in this manual and the Federal Poultry Products Inspection Act are in no way to be construed to supersede the provisions of the California Food and Agricultural Code pertaining to poultry inspection.

**PMI license is subject to timely yearly renewal.**

Newly amended FAC section 25056(a) says: “Applicants for renewal who have not paid the renewal fee by the expiration date of the license shall be assessed a twenty-five dollar ($25) penalty. Failure to pay the renewal fee plus the penalty within 90 days of expiration shall cause a revocation of a license.”

Section 1246.13. Training.

(a) Each licensed PMI shall be responsible for attending formal annual maintenance training provided by the Department, including, but not limited to, humane handling and slaughter of poultry.

(b) Failure of each PMI to attend annual maintenance training, as specified in subsection (a) of this section, shall be grounds for non-renewal, suspension, or revocation of the PMI's license.

(c) It is the responsibility of the establishment management and the licensed PMI to make arrangements in the work schedule to attend the annual maintenance training.

(d) Owners and managers shall be responsible for attending at least one scheduled departmental PMI training seminar or orientation on humane handling and slaughter of poultry procedures, as specified in subsection (a) of this section.
After you read the chapter “DEFINITIONS “ – please answer the following questions:

1. Define giblets
2. Define “free from protruding pinfeathers and hairs”
3. What does the term “Inspected for wholesomeness” mean?
4. What is the mark of inspection and what information does it provide?
5. What does the term “potable water” mean?
6. Define poultry
7. Define term Ready – To – Cook poultry
8. What is wholesome poultry?
SECTION I – GENERAL INFORMATION

Definitions:

Meat, Poultry and Egg Safety Branch: Headquarters:
   Physical Address: 2800 Gateway Oaks, Sacramento, California 95833
   Mailing Address: 1220 N Street, Sacramento, CA 95814
   Phone: (916) 900-5004, FAX: (916) 900-5334.

Ontario Area Office: 1910 S. Archibald Ave., Suite X, Ontario, CA 91761
   Phone: (909)773-0079, FAX: (909) 923-3961

The Meat, Poultry and Egg Safety Branch (Branch) is charged with the enforcement of California poultry inspection statutes and regulations. It has responsibility for providing training, assistance, advice and supervision of licensed Poultry Meat Inspectors.

Purpose of Inspection: The primary purpose of poultry inspection is the protection of the health of the public. A secondary purpose is the detection and control of animal diseases.

Duties and Responsibilities of Inspectors: In general, the PMI is responsible to see that all provisions of the law and regulations that pertain to poultry inspection are complied with in plants in which they are employed as inspectors.

The inspector (PMI) is responsible for the following:

a. The inspection of each poultry carcass processed in the licensed establishment for any disease or condition that might render the poultry meat unfit for human or animal food.

b. The inspection of the plant before and during operation to insure that its equipment is maintained in a sanitary condition.

c. Inspection during operations to insure that humane slaughter is enforced and sanitary processing procedures are followed.

d. Inspections to insure that all poultry and poultry meat products are properly labeled with an approved label in accordance with the provisions of the regulations.

e. Reporting all violations, if not corrected by plant management, to the Branch. (This responsibility is discharged when the PMI reports such violations to a Branch employee.) Inspectors are reminded of the provision of Section 1241(a) of the California Poultry Inspection Regulations which state, "Failure in effort on the part of the inspector to properly enforce poultry meat inspection regulations shall be sufficient cause for the director to revoke the license of such inspector."

f. The preparation and maintenance of such reports as may be required by the regulations.

g. Inspections to insure that all poultry and poultry products have been appropriately chilled and packed in sanitary way and stored in containers that will adequately protect them from damage and possible contamination during shipment and storage.
h. Assuring that all condemned products are denatured in a manner that will render them unusable for either human or animal food.

**Conduct and Dress of Inspectors:** The licensed Poultry Meat Inspector must set the example for other employees in the plant. The head should be covered with a protective head covering that will prevent falling hair and dandruff from contaminating products. The inspector should never, or permit others to, smoke or chew tobacco in rooms where edible products are prepared, stored, or otherwise handled. The inspector should make a point of washing hands before going to work or after visiting rest rooms. Clean plant clothing should be worn over street clothing. This same standard of cleanliness is expected of all employees in a food processing establishment. The inspector who appears for work in an unkempt condition, unshaven, in dirty clothing, does not wash hands after visiting the restroom, fails to clean his apron and boots before storing them away after a day's shift and, in general, ignores the rules of good personal sanitary habits encourages others to behave in a like manner.

**Licenses:** Inspectors must have readily available, at all times while engaged in poultry inspection duties, a valid Poultry Meat Inspector's license. It is required that all poultry inspectors display their current PMI licenses on the plant office wall.

Inspectors’ licenses are renewable ($100.00 license renewal fee) at the end of each calendar year. Applications for renewal must be postmarked prior to midnight, December 31, of the year in which they expire. In the event an application for renewal is submitted late, a penalty fee of $25.00 must be paid in addition to the renewal fee. **Renewal application submitted after 90 days of license expiration will not be accepted and the individual PMI license will be revoked.**

**House Duties:** Inspectors may be required to perform duties other than inspection, but only if such duties do not interfere with their duties as inspectors. Any violation of this requirement by plant management should be reported to a Branch employee as soon as possible.

**Publications:** Inspectors should have handy at all times, for reference, copies of the following publications:

b. California Poultry Inspection Regulations.
c. Written instructions pertaining to poultry inspection that may be issued by the Branch from time to time.
After you read the chapter “General information” – please answer the following questions:

1. What is the purpose of poultry inspection?
2. Name the responsibilities of the Poultry Meat Inspector in the poultry plant.
3. When and how is your Poultry Meat Inspector license renewed?
SECTION II - MICROBIOLOGY

This chapter provides basic microbiology information that can be useful to all who are involved in meat and poultry production. However, this chapter does not cover all information needed to produce safe and unadulterated product.

Definitions:

a. **Bacteria:** Bacteria are tiny, single cell, living organisms; so small that they can only be seen with the use of a microscope. One tiny speck of dust can carry thousands of them. Bacteria are responsible for most of the food borne diseases in man. They cost the meat/poultry industry millions of dollars each year through spoilage of products, lost sales and through lost time by employees.

b. **Spores:** Some bacteria, in order to survive, have the ability to form a protective coating around themselves when some unfavorable condition is encountered, such as loss of one of the elements which they need to grow in; loss of moisture, extremes of heat or cold, etc. While in this state they are called "spores." Bacteria in the spore form have been known to survive freezing temperatures indefinitely and boiling temperatures for several hours. While in the spore state they stop all activity, they do not feed or multiply. When conditions are again right for their growth they again start their cycle of reproduction. Bacteria with this ability to form a protective coating are known as "Spore Formers." Examples are bacteria from Clostridia group.

c. **Toxins:** During the process of growing and multiplying some bacteria give off a poisonous substance called "toxins." Some toxins cause food poisoning in man. While normal cooking temperatures will destroy bacteria organisms in food, such temperatures may not destroy the toxins produced by e.g. Staphylococcus aureus.

d. **Lag Phase:** Bacteria have another unique characteristic. When they are transferred from one environment to another, such as from a meat surfaces to a table, they will stop their cycle of reproduction for a period of from one and one half to two hours. This period of inactivity is known as the "lag phase". **Bacteria don’t do any damage to the meat while in this phase.** The recommendation that some equipment in any meat plant be sanitized every two hours is to take advantage of the lag phase.

e. **Growth Phase:** During this phase bacteria undergo their maximum growth rate and it is during this period that the incredible increase in bacterial numbers appear. In this phase meat will develop grossly detectable signs of spoilage and may actually be decomposed.

f. **Resting phase:** At this time bacteria are dying about as fast as they are being reproduced.

g. **Death phase:** There is an acceleration of the downward trend that begun in the resting phase.
Bacteria are found in most environments; the air we breathe, the food we eat, the water we drink, in our hair, on our clothing, and hands, and are present in large numbers in the intestinal tract of all animals. In fact, bacteria are found almost everywhere.

**Shape:**
Bacteria are grouped according to shape: spherical forms known as cocci, straight rods called bacilli, and curved or spiral rods known as spirilla.

**Reproduction:** Bacteria reproduce themselves by dividing. Under favorable conditions (mainly once being the right temperature, food and moisture present) in a given time bacteria will multiply. Multiplication and growth of bacteria is a simple process involving cell enlargement, followed by formation of a cell wall across the middle and, finally, separation into two cells. This process is known as binary fission. Thus one bacterium becomes two, two become four, four become eight, eight become sixteen, sixteen become thirty-two, thirty-two become sixty-four, and so on. Under ideal conditions this division of each cell can take place in as short a time as fifteen minutes. If we started with a standard plate count of 10,000 bacteria per centimeter, which is the allowable count for certified, grade A, raw milk and far below the count we would expect to find on most poultry carcasses, the 10,000 could become 2,565,000 bacteria in two hours.

We must be aware of factors described below that decide if bacteria will be controlled or eliminated.

1. **Temperature:** Majority of bacteria reproduce at temperatures between 40° and 140° Fahrenheit. Their most rapid multiplication takes place at temperatures of between 80° and 110° Fahrenheit. As temperatures are reduced to 40° F. and below, their growth is slowed significantly. At freezing temperatures their growth has stopped altogether. Freezing does not usually destroy bacteria but it does completely halt their cycle of feeding and reproduction. As soon as a product that has been frozen is thawed, bacterial growth and reproduction will be renewed. Hence the regulations governing thawing of frozen poultry. As temperatures approach 140° F. bacterial growth is again significantly slowed and as temperatures of 160° F. or above are reached, and depending on the length of time they remain at this temperature, most of them will be destroyed. For all practical purposes a temperature of 180° F and above will destroy instantly most of the bacteria of concern in the processing field except some spore formers.

2. **Food:** Any organic matter will provide sufficient food for bacteria to grow and multiply, providing that all three of the needed elements are present for a significant period of time; proper temperature, moisture, and food. A thin film of organic matter left on a boning table or grinder as a result of inadequate (insufficient) cleaning process will support millions of bacteria.

3. **Moisture:** Bacteria absorb food through their cell walls through a process called osmosis. The food must be in a liquid or semi-liquid state. Pans that have been cleaned and then nested while wet will not dry, hence the requirement that pans "shall not be nested", but stored in a manner that will allow for the free circulation of air around them.
GASEOUS ATMOSPHERE AND BACTERIAL GROWTH

- **Aerobic bacterium (aerobe)** – Grows in the presence of air.
- **Anaerobic bacterium (anaerobe)** – Grows in absence of air.
- **Facultative anaerobe** – Grows in the presence or absence of air.
- **Microaerophilic bacterium** – Grows in an atmosphere of less oxygen than in air.

TEMPERATURE AND BACTERIA GROWTH OR SURVIVAL

On the surface of meat exposed to the air in chill rooms we expect the growth **psychrotrophic** aerobic bacteria. However, on vacuum packaged meats, other bacteria, many psychrotrophic facultative anaerobes such as the lactic acid bacteria, will grow.

- **Psychrotrophic bacteria** – Capable of growth at commercial refrigerated storage temperatures.
- Most psychrotrophic bacteria grow best at 15 - 25°C (59- 77°F), but continue growth at a slower rate under refrigerated temperature. That is way these bacteria's are common meat and poultry spoilage bacteria.
- These characteristics are of great significance in newer packaging technology applied in the meat industry.

GROUPING OF BACTERIA ACCORDING TO THEIR ACTIVITIES IN FOODS AND SIGNIFICANCE TO PUBLIC HEALTH

Certain bacteria are useful as they can produce the desirable body, texture, and flavor in foods. For example, fermented sausage, pickles, cheese, yogurt, sauerkraut, olives, sourdough bread, and vinegars.

- **Spoilage bacteria** – bacteria that during growth cause quality deterioration and, ultimately, spoilage of food and in most cases are not considered a serious threat to human health. Consumption of spoiled food/meat normally causes only mild alimentary symptoms. However these bacteria change appearance of meats and make them unattractive to consumers.

- **Pathogenic bacteria** – bacteria that are capable of causing serious condition/disease in humans. They are definitely unwanted but they may be present on poultry or any other meat. When consumed in sufficient numbers they may cause food poisoning in man without the meat showing/being in a decayed or spoiled condition that is not noticeable to the inspector's senses of sight, feel and smell.

FOODBORNE DISEASE OR FOODBORNE ILLNESS

- **Foodborne disease or foodborne illness**: Infection or intoxication caused by microbial or chemical contaminants in foods.
- Some foodborne illness, such as **salmonellosis** and **staphylococcal food poisoning** can be caused by consumption of a food that contains only a few microorganisms or toxin.
- Other foodborne illnesses result from eating compounds, such as naturally occurring
WHICH BACTERIA ARE RESPONSIBLE FOR FOODBORNE ILLNESS?

Some bacteria cause more serious illness than others, but only a few are responsible for the majority of cases. Foodborne illnesses are the important public health problem in the USA. Data from various sources suggest that foodborne microbial pathogens may cause up to 7 million cases of illnesses each year, and 7,000 deaths. Of these, nearly 5 million cases of illnesses and more than 4,000 deaths may be associated with meat and poultry products.

The examples of bacteria that poultry operator should know:

- **SALMONELLA (over 1600 types)**
- **CAMPYLOBACTER**
- **ESCHERICHIA COLI O157:H7**
- **LISTERIA MONCYTOGENS**
- **SHIGELLA (over 30 types)**

**Most of them share these characteristics**

- **Found**: Intestinal tracts of animals, soil, water, sewage, feces etc.
- **Transmission**: Contaminated water, meat, or person-to-person by dirty hands.
- **Common symptoms**: Diarrhea, cramps, chills, vomiting, fever, headache, muscle pain etc. Symptoms can appear with a few hours to a few days from consumption of the contaminated food. Some of these bacteria like E.Coli, Clostridia and other can be deadly, specially for very young or old people.

**SALMONELLA (OVER 1600 TYPES)**
- Found: Intestinal tract and feces of animals; *Salmonella enteritidis* in raw eggs.
- Transmission: Contaminated raw or undercooked eggs, poultry and red meat, raw milk and dairy products; seafood.
- Symptoms: Stomach pain, diarrhea, nausea, chills, fever, and headache usually appear 6 to 48 hours after eating; may last 1 to 2 days.

**CAMPYLOBACTER**
- Found: Intestinal tracts of animals, birds, raw milk, untreated water, and sewage sludge.
- Transmission: Contaminated water, raw milk, and raw or under-cooked meat, poultry.
- Symptoms: Fever, headache, and muscle pain followed by diarrhea (sometimes bloody), abdominal pain and nausea that appear 2 to 5 days after eating; may last 7 to 10 days.
CLOSTRIDIUM PERFRINGENS

- Found: Soil, dust, sewage, and intestinal tracts of animals and humans. Grows only in little or no oxygen.
- Transmission: Called “the cafeteria germ” because many outbreaks result from food left for long periods in steam tables or at room temperature. Bacteria destroyed by cooking, but some toxin-producing spores may survive.
- Symptoms: Diarrhea and gas pains may appear 8 to 24 hours after eating; usually last about 1 day, but less severe symptoms may persist for 1 to 2 weeks.

ESCHERICHIA COLI - O157:H7

- Found: Intestinal tracts of some mammals, raw milk, unchlorinated water; one of several strains of E. coli that can cause human illness.
- Transmission: Contaminated water, raw milk, raw ground beef, unpasteurized apple juice or cider, uncooked fruits and vegetables; person-to-person.
- Symptoms: Diarrhea or bloody diarrhea, abdominal cramps, can begin 2 to 5 days after food is eaten, lasting about 8 days. In very young and old people may cause kidney failure and death.

There are many other pathogens that are transmissible from meat and poultry to man. Since thorough cooking destroys most of them, people can become a victim of these diseases causing organisms through handling of the raw products. Bacteria are considered hitchhikers, riding from place to place on specks of dust, moisture droplets in the air (such as in a sneeze or cough) by the hands of workers equipment surfaces, etc. For this reason, keeping equipment sanitary, good personal hygiene and good sanitary practices during operation and after hours are very important to all meat, poultry and processing plant employees. Please also remember that most consumers handle packaged meat or poultry products without sanitizing package material before opening.

Control: The very nature of meat and poultry products, with the exception of some canned meat/poultry products, makes it impossible to eliminate or destroy all bacteria. They can be outside and inside of each slaughtered animal and poultry and it is almost impossible to harvest/produce bacteria free fresh meat or poultry. However, through careful handling, sanitary processing procedures, use of sanitary equipment, and proper temperature control and/or cooking, their numbers can be reduced and their reproduction can be controlled. In order to control bacteria, a few simple facts concerning their growth must be understood and utilized. Control can be said to fall within three main areas: exclusion, inhibition, and destruction.

a. Exclusion: Bacteria are excluded through many means: through keeping bacterial ridden dust, dirt, flies, rodents and other vermin out of the plant and off the product; through the use of sanitary equipment and careful sanitary processing procedures. The trimming off of all contaminated surfaces is the recommended method of removing visible contamination from all freshly harvested meat.

b. Inhibition: The growth of bacteria is inhibited (slowed or stopped) by proper chilling, cooking, curing, handling and storage. There is an old saying among food handlers, “Keep food below forty degrees or above one-hundred-forty degrees Fahrenheit.” This
temperature range is called the Danger Zone.

c. **Destruction:** Bacteria are destroyed through the use of hot water, sanitizing chemicals such as chlorine or lactic acid solution and through proper cooking temperatures when this type of processing is used.

**Yeast and Molds:**
Yeast and molds are both fungi and contain no chlorophyll. They are not in the same classification as bacteria but have many characteristics in common. Yeasts and molds are aerobic and generally **not considered harmful.** Some molds may create a health hazard.

**Here are few tips how to stay healthy and make a safe and healthy product**

- Wash your hands thoroughly before and after all food preparation.
- Thoroughly wash food preparation implements/equipment before using them on other foods.
- Refrigerate meats and leftovers promptly.
- Don’t work at the same time with raw and cooked product at the same room as food can became contaminated by juices from raw poultry.
- Don’t eat while working.
- Wash your hands thoroughly when re-enter processing room.
- Wear clean garment and head cover when in the poultry processing room.

Bacteria are always present around us and on the raw meat/poultry products being processed and the inspector should always monitor quality of plant sanitation. Mostly bacteria and their toxins may cause disease in man and cause meat/poultry products to be spoiled.

While many text books have been written covering the subject, and a degree in the science of bacteriology requires a four-year course of study in a school of higher learning, for all practical purposes it can be said that the law and regulations that regulate the meat/poultry processing industry are based on the facts concerning bacteria as stated above.

If inspectors will always keep in mind these few facts concerning bacteria, they will be successful in carrying out their primary mission of "Protecting the Health of the Public." The reader who needs more detailed information is referred to any public library.

**Water requirements**
Each plant working under state inspection must have a certificate to prove that water used in the plant meets California drinking water standard for potability. In practice this water must be free from **E.Coli and other Coliform bacteria.** Water should be collected inside the plant and tested by one of the California licensed Lab. If plant is connected to municipal water (city water) the one test result that meets drinking water standard is good enough until some visible or known contamination happened. If this happened effective water treatment must be ordered and then water retest must prove its potability. If plant uses well water the water testing must take place at least every 6 months or anytime there is reasonable suspicious that water was contaminated. If ice is made (only ice from recognizable and tested source can be use in state inspected plants) the
same rules of potability apply.
Pathogen Reduction Interventions

Reduction of bacteria number on the fresh meat, poultry meat and whole poultry carcasses can be accomplished by anti-microbial interventions applied postmortem in the slaughter operation. The number of bacteria, including foodborne pathogens attached to poultry internal and external surfaces can be drastically reduced by applying one of the approved methods - electrolyzed oxidizing (EO) water, acidic EO water [EO-A; pH 2.6, chlorine (CL) 20 to 50 ppm, trisodium phosphate or other chemicals approved for that purposes. It is recommended that before any antibacterial intervention is used in the plant to reduce number of bacteria on the final product the sufficient research is done so only approved chemicals and methods will be implemented exactly as recommended by manufactures.
After you read the chapter “Microbiology” – please answer the following questions:

1. What are bacteria and why do we need to know about them?
2. Explain the role of spore forming bacteria and toxin producing bacteria.
3. Define the bacterial lag phase and growth phase and how to take advantage of each phase.
4. Name factors that control or eliminate bacteria.
5. What are spoilage bacteria and what are pathogenic bacteria?
6. Define foodborne disease.
7. Name a few bacteria responsible for the most common foodborne diseases related to poultry.
8. What are yeast and molds?
9. What are the main requirements related to plant water?
10. What are the pathogen reduction interventions?
SECTION III - SANITATION

A. Management's Responsibilities

1. It is mandatory that Management maintain the establishment and all plant equipment in a sanitary manner during operation hours. Management must create and have ready to implement upon inauguration of operation the SSOP program that addresses all cleaning and sanitizing issues in the plant.

2. Follow sanitary dressing and product handling procedures.

3. Use clean approved containers that will adequately protect poultry meat and poultry meat products from possible contamination.

4. Employ good personal hygiene practices.

B. Poultry Meat Inspector (PMI) Responsibilities

1. At least one PMI with the current license shall be present on the premises when poultry slaughter operations are conducted.

2. Conduct sanitation inspection of the establishment and equipment before operations for the day begin and record the findings.

3. Make periodic operational sanitation inspections throughout the day to determine if the plant and equipment are maintained in a sanitary condition and record all findings. PMI on duty should order the midday cleaning and sanitizing of all equipment when needed.

4. Inspect to ensure that sanitary dressing and product handling procedures are followed.

5. Verify that product is packed or stored in clean containers that will adequately protect the product from contamination.

6. Order the establishment not to begin or to stop operations at any time that the establishment fails to meet the sanitary requirements contained in the regulations.
C. Plant Sanitation

BASIC SANITATION OF EQUIPMENT AND FACILITIES

Agreement

Per regulation, when State inspection is granted to an establishment, a responsible plant official agrees to conform to State regulations and orders pertaining to inspection. The plant official thereby agrees to produce a wholesome product in a plant that will be maintained in a sanitary condition. (Food and Agricultural Code, Chapter 4.1. California Meat and Poultry Supplemental Inspection Act, §18970-18977, California Code of Regulations § 927-934, and Article 5, § 1204 Poultry Inspection). California Meat Inspection Regulations, California Code of Regulations and Referenced Federal Regulations, Subchapter 1 of Chapter 4, Division 2, of Title 3, 9 CFR (2006)

This statement emphatically establishes that plant management has the responsibility to produce clean product in a clean plant under good hygienic conditions. This also includes cooperation with MPESB personnel and providing information necessary for him/her to do a proper inspection job.

This chapter references applicable laws and regulations that obligate each establishment under state inspection to comply with sanitary requirements that should lead to production of wholesome products. Furthermore, this chapter provides only general information and some examples how to create and maintain a sanitary environment in state inspected establishments and it is not the intention of this chapter to provide detailed prescription that fits all plants on how to accomplish the goal of good plant sanitation. MPES Branch employees can offer assistance and better explanation on cleaning procedures or mandated plant SSOPs but it is still plant management’s responsibility to create and implement the SSOP.

Inspected establishments must meet two sets of regulations concerning sanitation: The Sanitation Standard Operating Procedures (SSOP) requirements and the Sanitation Performance Standards (SPS). Compliance with both is necessary if an establishment is to prevent the creation of insanitary conditions that can cause the adulteration of product. Under the SSOP requirements, each establishment must develop, implement, and maintain written cleaning procedures that are conducting daily, before and during operations, to prevent product from direct contamination and adulteration. More information about plant SSOP creation and SSOP samples are in the separate chapter of this manual. Each slaughterhouse maybe different and requires individual approach to meet these sanitary requirements.

Most of the SPS address conditions within and around the establishment (e.g., ventilation, lighting, facility and equipment construction, and maintenance of the grounds). A few address plant operations and may be met through the establishment’s SSOP (e.g., cleaning and sanitizing food contact surfaces). SPS are an integral part of the overall public health picture of a facility or a plant. They are used in conjunction with SSOP requirements to ensure that wholesome products are produced in a sanitary environment.
SPS carry as much regulatory weight and enforceability as any other part of MPESB/FSIS’s regulatory food safety system. The enforcement strategy, however, is different. The SPS rule requires the following businesses to operate in a sanitary environment.

- Federal and State inspected meat and poultry establishments
- Import/Export facilities
- Identification (ID) warehouses
- Custom-exempt operations

Each official establishment must have a competent Poultry Meat Inspector assigned to be responsible for sanitation requirements. His/her responsibilities include activities as described in the Sanitation Standard Operating Procedures (SSOP) and Sanitation Performance Standards (SPS) including but not limited to pre-operational inspection of the plant and equipment prior to the start of operations and inspection activities during operations.

**Training**

Plant management has the responsibility to train plant supervisors and employees in the hygienic handling of product and other sanitary requirements to ensure cleanliness in the preparation and handling of edible product. *(Food and Agricultural Code §18983)*

**Sanitation Performance Standard**

Performance standards set the results to be achieved, but they don’t prescribe the step-by-step procedures to produce safe meat and poultry product. Simply put, the expected result is defined in the regulation, but the methods to achieve that result are not specified. The performance standards allow establishments the flexibility to develop and employ innovative and unique sanitation procedures to achieve the desired results. Although plants can use varying means to meet the performance standards, the required results are always the same.

**Plants must:**

1. Operate under sanitary conditions,
2. Ensure product is not adulterated, and
3. Operate in a manner that does not interfere with MPES inspection and enforcement of the standards.

**Sanitation Standard Operating Procedures**

SSOPs are written descriptions of the procedures that a meat or poultry processor uses to prevent contamination or adulteration of their product. These include the actual procedures they perform to clean their equipment, utensils and facilities and other procedures they use to insure their product is not contaminated. Meat and poultry processors under Federal or State inspection must meet the specific requirements for SSOP’s outlined in Federal Law. These requirements can be found in the Code of Federal Regulations at 9 CFR 416.11 through 416.17.
1. Need for a Plant Sanitation Program.
Experience has shown that without a planned program, plant sanitation is apt to be inconsistent. Regardless of the shift or supervisors involved in cleanup activities, sanitation should be ongoing and consistent. Therefore, a good sanitation program is recommended and should be developed by plant management as a guideline for plant employees to follow. The plant may submit the sanitation program to the Branch inspector for review to determine whether it complies with all applicable rules and regulations.

2. Establishing and Maintaining a Sanitation Standard Operating Procedures (SSOP’s) Program.

To develop a good program; the plant should determine what is to be done, how it is to be done, and who is to do it.

Most problems can be avoided by proper training of supervisors and employees in effective cleaning techniques and by proper selection and use of cleaning agents, disinfectants, and sanitizers. A good maintenance program keeps gradual deterioration in check, prolongs facilities and equipment life, and makes sanitation easier.

Authority
Proper sanitation is a fundamental requirement of the State meat and poultry inspection laws that the Branch enforces. The law is quite clear: Meat and poultry products produced, packed, or held under insanitary conditions where they may have become contaminated with filth or may have been rendered injurious to health are deemed adulterated, without any further showing required by MPES.

Title 3. Food and Agriculture  Division 2. Animal Industry  Chapter 4. Meat Inspection

Subchapter 1.

\(^{1}\)Article 3. Facilities for Inspection and Sanitation

§ 902.10. Implementation of Sanitation SOP's.


§ 902.11. Maintenance of Sanitation SOP's.


§ 902.12. Corrective Actions.

Each official establishment shall take corrective actions in accordance with 9 CFR section 416.15 (2006).

§ 902.13. Records Retention.

Each official establishment shall keep and retain records in accordance with 9 CFR section 416.16 (2006).


The Department shall verify the adequacy and effectiveness of each official establishment's Sanitation SOP's in accordance with 9 CFR section 416.17 (2006).
Sanitation Standard Operating Procedures (SSOP) Reference: 9 CFR 416.11 through 416.17

§ 416.11 General Rules
Each official establishment shall develop, implement, and maintain written standard operating procedures for sanitation (Sanitation SOPs) in accordance with the requirements of this part.

Sanitation Standard Operating Procedures (SSOPs) are written procedures that an establishment develops and implements to prevent direct contamination or adulteration of product. The establishment must also maintain daily records sufficient to document the implementation and monitoring of the SSOPs and any corrective action taken. The establishment is required to maintain these written procedures on file, and they must be available to MPES upon request. It is the establishment’s responsibility to implement the procedures as they are written in the SSOPs. If the establishment or MPES determines that the SSOPs fail to prevent direct contamination or adulteration of product, the establishment must implement corrective actions that include the appropriate disposition of product, restoration of sanitary conditions, and measures to prevent recurrence.

§ 416.12 Development of SSOPs
(a) The Sanitation SOPs shall describe all procedures an official establishment will conduct daily, before and during operations, sufficient to prevent direct contamination or adulteration of product(s).
(b) The Sanitation SOPs shall be signed and dated by the individual with overall authority on-site or a higher level official of the establishment. This signature shall signify that the establishment will implement the Sanitation SOPs as specified and will maintain the Sanitation SOPs in accordance with the requirements of this part. The Sanitation SOPs shall be signed and dated upon initially implementing the Sanitation SOPs and upon any modification to the Sanitation SOPs.
(c) Procedures in the Sanitation SOPs that are to be conducted prior to operations shall be identified as such, and shall address, at a minimum, the cleaning of food contact surfaces of facilities, equipment, and utensils.
(d) The Sanitation SOPs shall specify the frequency with which each procedure in the Sanitation SOPs is to be conducted and identify the establishment employee(s) responsible for the implementation and maintenance of such procedure(s).

Establishment Responsibilities

The establishment has the responsibility to develop written SSOPs that contain procedures that the establishment will implement to prevent direct contamination or adulteration of product. It is also required that SSOPs describe the procedures that the establishment will take to prevent direct contamination or adulteration of product. The establishment and inspection personnel should understand that there are not separate SSOPs for different operations or different shifts. The SSOPs cover the entire establishment and all shifts of operation.
These written procedures must:

1. Contain all the procedures the establishment will conduct daily, before and during operation.

2. Identify the procedures to be conducted prior to operations (pre-op) and address, at a minimum, the cleaning of food contact surfaces of facilities, equipment, and utensils.

3. Specify the frequency with which each procedure in the SSOPs is to be conducted and identify the establishment employee or position responsible for the implementation and maintenance of the procedures.

4. Be signed and dated by the individual with overall authority on-site or a higher-level official of the establishment. This signature signifies that the establishment will implement the SSOPs as written and will maintain the SSOPs in accordance with the requirements of this part.

MONITORING

§416.13 Implementation (Monitoring) Requirement

a) Each official establishment shall conduct the pre-operational procedures in the Sanitation SOPs before the start of operations.

b) Each official establishment shall conduct all other procedures in the Sanitation SOPs at the frequencies specified.

c) Each official establishment shall monitor daily the implementation of the procedures in the Sanitation SOPs.

1. Establishment Responsibilities

The establishment is responsible for developing written procedures that are sufficient to prevent direct contamination or adulteration of product. The establishment also has the responsibility for implementing the procedures in the written SSOPs. If the establishment writes a procedure in its SSOP, it must implement that procedure and monitor it daily. In other words, the establishment is responsible for doing what it said it would do.

MAINTENANCE

§416.14 Maintenance Requirement

Each official establishment shall routinely evaluate the effectiveness of the Sanitation SOPs and the procedures therein in preventing direct contamination or adulteration of product(s) and shall revise both as necessary to keep them effective and current with respect to changes in facilities, equipment, utensils, operations, or personnel.

1. Establishment Responsibilities
Before State inspected meat or poultry establishments are permitted to operate, they must develop SSOPs that prescribe sanitation measures to prevent product adulteration or contamination. This means establishments can only speculate about which sanitation measures should be included in their SSOPs to prevent the occurrence of unsanitary conditions in their production process. The effectiveness of these measures is unknown initially. Therefore, it is necessary for establishments to evaluate the effectiveness of their SSOPs once they are implemented.

Each establishment has two primary obligations it must meet to comply with the requirements for the SSOP maintenance regulation. The first responsibility requires establishments to evaluate the effectiveness of all SSOPs that have been implemented in their production operations and the second requires that the company revise the SSOP as needed in order to ensure that it is reflective of the operation and that the SSOP is effective. This regulatory requirement encourages establishments to develop a system for the evaluation of their written SSOPs in order to prevent direct contamination or adulteration of product.

Although establishments must identify the members of their management team who will be responsible for implementation and evaluation of their SSOPs, they are not required to identify the method the individuals employ to perform the evaluations. The methods used within the establishment’s evaluation system will vary from one plant to the next. The regulation only requires that establishments perform an evaluation of the effectiveness of their SSOPs; it does not dictate how establishments should perform this evaluation. The establishment must sign and date the SSOPs any time modifications are made. However, there is no regulatory requirement that the plant personnel notify MPES inspection personnel of the change.

CORRECTIVE ACTION

§416.15 Corrective Action Requirement

(a) Each official establishment shall take appropriate corrective action(s) when either the establishment or MPES determines that the establishment’s Sanitation SOPs or the procedures specified therein, or the implementation or maintenance of the Sanitation SOPs, may have failed to prevent direct contamination or adulteration of product(s).

(b) Corrective actions include procedures to ensure appropriate disposition of product(s) that may be contaminated, restore sanitary conditions, and prevent the recurrence of direct contamination or adulteration of product(s), including appropriate reevaluation and modification of the Sanitation SOPs and the procedures specified therein or appropriate improvements in the execution of the Sanitation SOPs or the procedures specified therein.

1. Establishment Responsibilities

These regulations require the establishment to take corrective actions when either the establishment or MPES determines the **SSOP failed to prevent direct product contamination or adulteration.** Regardless of the type or cause of the failure, corrective actions must be taken. There are three parts to corrective action and all three of these requirements must be met and recorded each time product contamination occurs. The corrective actions include appropriate disposition of product.
NOTE: Most of the time product will not be involved during pre-operational sanitation monitoring. When the establishment finds direct food contact surfaces that are unclean during its monitoring of pre-operational sanitation and cleans the surfaces before product passes over that surface, there is no noncompliance. In these situations, the establishment’s SSOP has worked as intended. The establishment is not required to notify inspection personnel when product contamination occurs, but has the responsibility to implement corrective actions that will meet the requirements of §416.15.

The establishment should take full responsibility for the corrective actions meeting the three requirements of the regulation.

Those three regulatory requirements are:

1. Appropriate **Disposition** of products that may be contaminated;

2. **Restoration** of sanitary conditions;

3. **Prevention** of recurrence of direct contamination or adulteration of products.

**RECORDKEEPING**

§416.16 Recordkeeping Requirement

(a) Each official establishment shall maintain daily records sufficient to document the implementation and monitoring of the Sanitation SOPs and any corrective actions taken. The establishment employee(s) specified in the Sanitation SOPs as being responsible for the implementation and monitoring of the procedure(s) specified in the Sanitation SOPs shall authenticate these records with his or her initials and the date.

(b) Records required by this part may be maintained on computers provided the establishment implements appropriate controls to ensure the integrity of the electronic data.

(c) Records required by this part shall be maintained for at least 6 months and made accessible available to FSIS. All such records shall be maintained at the official establishment for 48 hours following completion, after which they may be maintained off-site provided such records can be made available to MPESB within 24 hours of request.

1. **Establishment Responsibilities**

§416.16 require the establishment to maintain **daily** records sufficient to document the implementation and monitoring of the SSOPs and any corrective actions taken. The establishment must have records documenting that monitoring has been conducted daily for each of the procedures specified in the SSOPs. If the establishment has specified a monitoring frequency in the SSOP that is more frequent than daily, the documentation would have to reflect that the monitoring activities had been conducted at the specified frequencies. The establishment employee specified in the SSOPs as being responsible for the implementation and monitoring of the procedures shall authenticate these records with initials or signature and the date.

There must also be a written record of any corrective actions required by §416.15. These records must be maintained daily. **The establishment has until the beginning of the same shift the following business day to complete these records.**
§416.16(b) provides the establishment the flexibility to maintain these records on a computer system provided the establishment implements appropriate controls to ensure the integrity of the electronic data. The records must be kept on-site for 48 hours and must be maintained for at least 6 months. After the initial 48 hours, the records may be kept off-site as long as they can be retrieved for a program employee within 24 hours of the request.

**Functions of Plant Inspectors**

**Poultry Meat Inspectors (PMI)** must function as sanitarians, in addition to their other duties, in plants in which they are employed as inspectors. The importance of the part that good plant sanitation plays in the production of clean wholesome meat/poultry products in a sanitary environment cannot be overemphasized. In order for inspectors to function adequately in the field of sanitation, they must understand and use the information concerning bacteriology contained in section II of this handbook. They must have a thorough knowledge of the plant, its equipment, methods of operation, and approved tools, methods used in the cleaning process and proper sanitation inspection procedures.

a. **Frequency of Sanitary Inspections:** The PMI inspecting plant sanitation is required to make a thorough pre-operational sanitary inspection of the plant prior to start of operations (custom slaughtering) and its operational sanitation at a minimum once daily.

b. **Technique of Inspection:** The PMI should have a flashlight, green "Reject"/"Retained" tags and the Monthly Sanitation Report. Poultry Meat Inspector performs organoleptic inspection making use of his/her sense of sight, feel and smell. Surfaces of equipment should feel clean to the touch. Even though a slight film left on equipment is not readily seen, it is quickly detected by the sense of feel when the hand is passed over it. The inspector's sense of sight quickly tells him whether the plant is in order (looks clean). The sense of smell (smells clean) will also quickly inform the inspector if there is any spoiled product stored on the premises or some organic residue such as blood being left on equipment due to insufficient cleaning. The inspector's sense of smell as well as sight will quickly lead him to the source of trouble.

c. **Preoperational** inspection should be planned to start at the point where the plant operations begin and should follow the path of the flow of product. This often permits the cleaning or re-cleaning of items of equipment or rooms found to be in an unsanitary condition without undue delay of the plant's operations. The inspector should be thorough and follow the same routine each day in making sanitary inspections. Plant personnel and cleanup crews soon come to know the inspector that is lax and consequently will slight areas of cleanup where they know the inspector seldom looks.

d. **Operational** - PMI must perform an operational sanitary inspection of the plant as described in the plant's SSOP, as well as being alert for any insanitary condition that may develop during operations. These inspections must be performed at a minimum of once daily.
Most operations under state inspection are done under room temperatures and due to that all equipment on which edible products are handled, or come in contact with, is recommended to be cleaned and sanitized every 5 ½ hours of operations. The importance of providing sanitary surroundings and sanitary equipment in red meat, poultry or meat processing operation cannot be over emphasized. Remember the growth and feeding habits of bacteria.

The state inspected Poultry Plant must be run in the sanitary manner. The customer/consumer expects clean and wholesome poultry meat that is free of visible defects and safe to be processed. Often customers do not have enough knowledge to determine the sanitary quality of the meat/poultry product they obtained/purchased and they rely on plant management and employees, licensed Poultry Meat Inspectors (PMI) and the Meat, Poultry and Egg Safety Branch.

**Plant management is responsible for cleaning and sanitizing** all plant equipment(s), tools and parts of the premises that are integral parts of a good plant sanitation plan. In plants that operate every day, the cleaning and sanitizing should take place on a daily basis to assure that only a cleaned and sanitized plant is in operation. Plant cleaning can even be considered as one of the most important activities in the meat plant, as these measures provide the necessary environment for proper meat handling and processing. It is highly recommended that the manager or designated person regularly check if cleaning and sanitizing procedures are conducted as described in SSOP, using the chemicals in the way recommended by manufacture, to accomplish the desirable sanitary result.

Efficient plant cleaning and sanitizing is often neglected as it requires extra work and the positive effects are not immediately visible. However, failures in plant hygiene can cause high financial losses in the long run. **Unhygienic** conditions in a meat plant result in;

- foodborne diseases
- spoilage of valuable food and/or
- unattractive, tasteless products

Proper cleaning and sanitizing is becoming increasingly important in modern meat/poultry plant as more perishable and hygienically sensitive products come to consumers. The microbial load of such produced product must be as low as possible to guarantee wholesomeness of it, adequate shelf life and to avoid its spoilage.

**Facilities and equipment** have closely associated requirements: Both require prior approval by MPES, both must be constructed of approved materials, and both must be susceptible to being readily and thoroughly cleaned and maintained in a sanitary manner.

Any problem with facilities or equipment will very quickly affect the ability of the establishment to maintain a sanitary plant environment. One method of ensuring the proper design and construction of the establishment is the requirement that blueprints be approved by MPES. Prior to construction of or significant modification of a facility.
Cleaning is a process of removal of all visible dirt, rust, lubricating compounds and all organic substances, such as fat, blood and other protein particles, from surfaces of walls, floors, tools and equipment. Through the cleaning procedures, high numbers of microorganisms (90% and more) present on the mentioned objects will be removed. A piece of equipment that is “clean” - looks clean, smells clean, and feel clean.

However, many microorganisms stick very firmly to surfaces, in particular in tiny almost invisible layers of organic materials, so called biofilms, and will not entirely be removed even by profound cleaning but persist and continue multiplying.

It is very important that cleaning chemicals are strictly used according to the specifications given by the manufacture.

Sanitizing follows cleaning. It is a process of applying a sanitizer on cleaned surfaces of plant equipment or other parts of the establishment (walls, floor, personal tools etc.) with the purpose of inactivating (kill or reduce) the greatest possible number of microorganisms that survived cleaning. Inactivation of those microorganisms treatments using hot water or chlorine solution or through the application of other approved sanitizers. These sanitizers are chemical substances, strictly used according to the specifications given by the manufacture to kill/reduce microorganisms and should not affect human health through hazardous residues.

When starting cleaning and sanitizing measures all food products (meat) must be removed from the area because:

- Physical cleaning with pressurized water may stir up dirt or produce contaminated water droplets (aerosol), which could contaminate meat present in such rooms.
- Chemical cleaning/sanitizing may produce toxic residues when in contact with remaining meat.

Cleaning Tools, Detergents and Sanitizing Agents:

a. Steel Wool: Steel wool is NOT approved for use in poultry plant cleaning process. Small bits of the steel wool are prone to break off and contaminate the equipment and may find their way into the product. If these bits of metal should be ingested by the consumer, severe gastric disorder could result. In addition, steel wool often rusts and cannot be completely cleaned of the organic material it picks up during use.

b. Metal Sponges: These scrubbing tools are fabricated from large strips of metal and if broken off the pieces are readily seen and removed from the equipment. Therefore, there is little danger that they may contaminate the product and be ingested by the consumer. Approved.

c. Cloth Towels and Rags: The use of cloth towels and rags is prohibited in any cleaning process. They pick up and retain bacterial laden organic matter, bacteria and do little more than distribute them evenly around the equipment. They are seldom cleaned after use and become a source of off odors in the plant as well as a source of contaminants.
d. **Disposable paper:** towels may be used when desired, provided they are discarded after each use.

e. **Brushes:** of either fiber or synthetic bristles should be used for scrubbing equipment. They should be of such quality that they hold their bristles under hard usage. The use of nylon bristled brushes with hot water is not recommended due to the heat softening the bristles until they are of little use.

f. **Scratch/scouring (green) pads:** acceptable provided they do not fragment, leaving pieces on equipment, they should be readily cleansed of organic material or be disposed after each use.

Cleaning tools can be an important source of bacterial contamination of equipment and product. They must be kept clean and sanitized frequently and must be replaced when they become so worn out that they are not effective and cannot be properly maintained.

**Detergents** are used to “clean” facilities and equipment. An effective detergent should have the following properties:

1. Be noncorrosive to surfaces on which they will be used.
2. Have good wetting ability.
3. Have the power to emulsify and suspend soils such as grease or oils in solution.
4. Be able to dissolve organic and inorganic solids.
5. Be easily rinsed from surfaces.
6. They should not contain any masking odor or perfume

**Detergent Classification:**

1. **Strongly Alkaline:** These detergents are highly effective in dissolving fats, oils, protein residue and other organic deposits, and are moderately effective in removing burned or dried on material. They have the disadvantage of being corrosive to tin, aluminum, and oil based painted surfaces. They cause deterioration of wood and many fabrics. In addition, they are difficult to rinse from surfaces. Examples: lime, sodium phosphates

2. **Mildly Alkaline:** Mildly alkaline detergents are effective in removing many deposits and have the advantage of being either noncorrosive or only slightly corrosive to painted surfaces and most metal encountered in food plants. At concentrations employed for ordinary cleaning, they do not constitute a hazard to personnel using them. Examples: most soaps and general-purpose detergents.

3. **Strongly Acid:** Strong acid cleaners are highly effective on both organic and inorganic matter, but their use is recommended for very difficult cleaning jobs only. Strong acid cleaners are dangerous to both personnel and equipment. Examples: Phosphoric acid, hydrochloric acid, sodium bisulfate.
4. **Mildly Acid**: Mild acid cleaners are usually satisfactory for removing deposits left by hard water and are relatively noncorrosive to most metal surfaces.

*All detergents used in State inspected establishments must be used strictly for the purpose they were made for and according to manufacture recommendations and specifications.*

**Sanitizers**

**Sanitizing Agents** are used to reduce in number/kill bacteria remaining on facility and equipment surfaces after cleaning. A “sanitized” piece of equipment is one that has been cleaned and that treated with a sanitizer to kill/reduce bacteria.

1. **Hot Water** to be effective sanitizer, but must be at least 180 degree F. at the point of contact with the surface you wish to sanitize. Used as a rinse after cleaning, it has the advantage of effectively removing soils taken into solution in the cleaning process and destroying any bacteria on the surface through heat. In most cases hot water dries rapidly from surfaces, thus removing one of the elements which bacteria need to multiply. However hot water can easy create steam leading to unwanted condensation on walls, ceiling, equipment etc.

2. **Chlorine**: Clear solutions of 50 to 200 parts per million of available chlorine are very effective as sanitizers. Many detergents have chlorine combined with them in one form or another. Since organic matter and heat inactivate chlorine, the chlorine solution must be made always with cold water and applied to clean cool surfaces to be effective.

*Even when in-plant chlorination of the water supply is available, this should never be used as a substitute for a good sanitation program. There is no substitute for thorough cleaning and rinsing with clear hot water. In-plant chlorination is highly effective in reducing the number of bacteria present during processing and its use for this purpose is recommended.*

3. **Steam**: **NOT recommended as a sanitizer.** Steam is often used in the mistaken belief that it is a good sanitizing agent. While steam is an effective sanitizer as it issues from the nozzle of the steam hose, it loses its effectiveness just a few inches from the nozzle. Steam under pressure is also useful in the removal of heavy deposits of organic matter from equipment before cleaning and sanitizing.

4. **Other Sanitizing Agents**: There are many other chemical sanitizing agents, such as those derived from iodine and quaternary ammonium products. Some of them required to be rinsed off the equipment after being used and others don’t require rinsing.

*In general, all sanitizers should be approved prior to use. To accomplish the purpose of sanitizing they must be applied only on cleaned surfaces and must be applied according to the manufacture’s recommendations. It is advisable to contact Branch to insure any chemicals (cleaners and sanitizers) to be used in the plant are acceptable.*
Storage of Cleaning Tools, Detergents and Sanitizing Agents

A special storage place in the plant, away from edible products, is to be provided for these items. All cleaning tools, brushes, etc., should be cleaned and sanitized and hung on racks to dry after use. Detergents and other chemicals used in the cleaning of the plant should be stored in tightly covered, properly labeled containers. There should be no possible contact between these items and edible products or raw products used in the manufacturing processes. All hoses should be stored on hose racks off the floor.

Good plant sanitation is essential in the production of wholesome meat and poultry products. It also results in more efficient operations, better workmanship, fewer accidents, and in greatly improved consumer/industry relations.

How to carry out plant cleaning and sanitizing

Please note that more detailed information about after work cleaning procedures (plant cleaning and sanitizing) is provided in the SSOP Requirements chapter.

General

a. Outside premises: There should be no organic matter accumulated outside plant that can provide food for flies and other vermin. Outside premises should be kept reasonably free of clutter to promote frequent cleaning. Unused equipment stored outside should be stored on racks or pallets in a manner that will permit the circulation of air around and under it. Tall grass and weeds to be eliminated. This prevents it from becoming a harborage for rodents and other vermin.

b. Cleaning of Plant and Equipment: Refuse/inedible material must be taken from the operational area at least once in the end of each operational day. This material should be picked up daily by a licensed Rendering Company or burned in an incinerator or stored in a properly marked and tightly closed containers in the designated area under refrigeration until a Renderer collects it. It is required that the plant and equipment be cleaned prior to start of each day’s operations as described in the establishment’s written Sanitation Standard Operating Procedure (SSOP).

Most establishments conduct plant cleaning and sanitizing right after processing in the plant is finished for a day. It is an easiest way to clean plant and highly recommended by the Branch. However, the cleaning also can take place just before operation starts as long as it produces cleaned and sanitized plant in which to operate. Cleaning is a plant management responsibility but should be verified and checked for accuracy (findings to be recorded) before each day of operation by the licensed Poultry Meat Inspectors.
Preconditions for efficient cleaning and sanitation are:

- Premises and equipment must be “cleaning-friendly”, which means
  - easy and practicable access to all dirty areas,
  - smooth surfaces and impermeable materials for building structures and equipment to be cleaned.
- Proven methods for meat plant cleaning and sanitizing must be available.
- Acceptable cleaning and sanitizing chemicals used
- Personnel must be regularly instructed and trained how to properly clean, sanitize and maintain good sanitary conditions.

When to use the REJECT/RETAINTED tag

When the Poultry Meat Inspector notes that a piece of equipment that is unsanitary, he/she may attach a green "Reject" tag until it has been properly cleaned. This prevents its use before cleaning. The use of "Reject" tags is particularly important on pieces of equipment that are not needed for immediate plant operations and are shunted aside for later cleaning. During the inspection, if the inspector notes any product that may need some further attention to place it in an acceptable condition, such as that packed in unclean containers, the green "Retained" tag should be attached to the product until it is returned to an acceptable condition. Of course, any spoiled or contaminated products should be immediately condemned and denatured. The use of "Reject" / "Retained" tags is not intended as punishment, but is simply one of the tools an inspector can employ to make sure that the plant and equipment are sanitary when used and that the products processed therein are clean and wholesome when offered for sale.

A. Rejected/Retained Tag (Red in color) (79-107)
   1. Used to tag unsanitary or otherwise unsatisfactory equipment or facilities (Rejected), or to hold product, packaging material, non-meat product ingredients, etc., pending re-inspection and/or disposition (Retained).
   2. Removed, following re-inspection and disposition, only by Branch employee.

B. Rejected/Retained Tag (Green in color) (79-107A)
   1. Used to tag unsanitary or otherwise unsatisfactory equipment or facilities (Rejected) or to hold product, packaging material, non-meat product ingredients, etc., pending re-inspection and disposition (Retained).
   2. Applied and removed, following re-inspection and disposition, by Branch employee or Poultry Meat Inspector (PMI).
ACCEPTABLE STANDARDS

**CLEAN**—an article that is free of dust, dirt, grease, and any other foreign matter and is clean to the sight, touch and smell (organoleptically clean).

**SANITARY**—free from dirt, filth and contamination and free from any other substance or organisms (e.g. bacteria) which are known to be injurious to human health or which would render the product adulterated.

**SSOP**
The failure of most written Sanitation Standard Operation Procedures (SSOPs) is that they are not written with sufficient detail or specifics to completely explain and reflect the establishment’s actions or activities as related to sanitation. The written (narrative) Sanitation Standard Operating Procedure (SSOP) describes the what, when, where, and how sanitation activities, observations and recordings are performed by specified plant personnel.

The written SSOP plan must describe the PROCEDURES the establishment will conduct before and during operations and the FREQUENCY at which they will be conducted to prevent direct contamination or adulteration of products(s).

**SEE SSOP GUIDELINES**

Cleaning and sanitizing procedures in the meat industry are complex processes depending on the surfaces to be treated and the kind of contamination to be removed. More complicated pieces of equipment must be disassembled for cleaning. Selection of suitable chemicals may require some knowledge as efficient cleaning and sanitizing is of utmost importance for product quality and safety.

**PLANT CLEANING STEPS AND TECHNIQUES**

**Physically removal:** The first step is to physically remove scraps, i.e. coarse solid particles (inedible material), with a brush or broom and shovel and deposit it in enclosed containers clearly marked INEDIBLE under refrigeration.

**Rinse or high pressure rinse:** High pressure water is efficient for surface cleaning. It serves for the removal of remaining small solid parts, blood and dirt from the entire floors and walls of processing sections as well as for the removal of meat and fat particles and layers of protein from tools and equipment.

**Manual cleaning:** More profound clean-up procedures require water in sufficient quantities. Manual cleaning using brushes or scrapers is widely applied in small-scale operations although they are labor and time intensive. It is absolutely essential that this cleaning step as well, as the previous one, is not done with hot water that could cook organic matter on the equipment and thus make it more difficult to clean.
**Higher pressure cleaning:** It is method commonly used in the meat industries. The pressurized water is applied by high pressure units and special spraying lances. If warm water is used, the temperature should be 120°F at the nozzle in order to achieve sufficiently high temperatures at the surfaces, in particular for fat removal. Cleaning with equipment producing a **pressurized steam/water-mix** is even more efficient. The **disadvantage** of this method is the intense fog and aerosol formation, which may not only cause unwanted **microbial spreading** by water droplets (aerosol) but also affect installations and equipment through high humidity and excessive condensation. **Please note that usage of the high pressure water in cleaning, if not done properly, may create additional problems. Therefore it is not recommended for all plants.**

**Chemical cleaning:** The removal of loose dirt and meat/fat residues by water does not mean that cleaning was complete. Sticky layers of fat or protein will still exist and must be removed. For this purpose chemical cleaning solutions can be very effective. Application can be by using hand brushes on dismantled equipment or for smaller surfaces to be cleaned. Mechanical cleaning with high pressure equipment together with cleaning solutions is used for larger floor and wall areas as well as working tables, containers and equipment. Traditional cleaning substances for manual use are **alkaline.**

The plant and plant premises must be cleaned as stated in the plant’s SSOP. The cleaning of production area floors, floor drains, walls, and ceilings must be identified. Overhead fixtures, such as lights, pipes and overhead conveyors, must be cleaned. SSOP should be specific to each facility where meat or poultry products are produced or processed. Various cleaning schedules, including daily, weekly, monthly and annual duties, should be integrated to provide a well rounded sanitation plan.

**Remember, one grain of dust sifting down from these fixtures can carry thousands of bacteria.**

**General Sanitation:**

1. **Utensils/tools** must be cleaned and sanitized and stored on racks in a manner that will permit them to dry. Employees should not be permitted to take favorite knives, scissors, etc. home with them. If this practice is permitted, some of these utensils will not be properly cleaned or will often be re-contaminated in transit.

2. **Containers** etc., must be cleaned and sanitized and stored in a manner that will permit them to dry. Any bacteria that may remain on such equipment cannot multiply without moisture. It is for this reason that regulations forbid the nesting of pans. All bird cages must be cleaned and disinfected after each use.

3. It is recommended that **equipment** over which edible products pass or come in contact (product contact surfaces) must be cleaned and sanitized every four hours and be rinsed with hot water every two hours during processing.
This is usually accomplished during break periods. This takes advantage of the bacterial "lag phase". All equipment should be rinsed with hot water prior to resumptions of operations to remove any dust, dirt that may have collected on it during the night.

**General Sanitation non-production areas:**

1. **Toilets, break rooms, and workers dressing rooms** must be cleaned and kept clean and the cleaning frequency of these rooms will depend mainly on how many people work in the plant, how often plant operates etc. Aprons, boots, etc., must be cleaned before storing and stored in a manner that will permit them to dry. Hand washing basins, both in toilets and in processing rooms, must be cleaned and kept clean. Employees will seldom use a dirty hand wash basin or one in which unused utensils are stored. Clean toilets, dressing rooms, and hand washing basins encourage employees to practice sanitary personal habits. Garments and hats used in production area shall not be worn outside this area. All processing workers upon immediately entering the production area from outside areas of the plant must wash and sanitize their hand before resuming product handling.

2. **Dry storage areas:** must be clean and dry. Any spilled grains, bird food etc., must be swept up and disposed of. Spilled grains are an open invitation for rats, mice and other vermin to enter the plant. Cereal grains that have become wet and left to sour will draw flies in large numbers. **Cleaning Chemicals** should be stored in separate rooms or store in a manner that will be protected and safe. If on pallets they should be on **racks 12 inches off the floor**. **Packaging materials** must be stored in a manner that will protect them from dust, dirt, any vermin that may gain access to the plant, and from contamination from cleanup activities. It is recommended that some are stored in tightly closed containers.

3. **Coolers** must be cleaned and stay free from mold and objectionable odors when in use. Products stored on pallets (only plastic pallets are recommended to be used) must be frequently moved if on **racks** or shelving **12 inches off the floor** to protect them from water that may collect on the floor or which may back up into coolers from clogged drains. (Inspectors who note standing water on cooler floors or clogged drains should immediately notify the proper supervisory personnel and require that the condition be corrected).

   Cooler temperatures must be maintained at 40° Fahrenheit or below with free air circulation around stored products. As the keeping of perishable product constantly under the right temperature inside the cooler is important, it is recommended that temperature measuring devices be checked regularly for accuracy.

4. **Freezers** if they exist must be clean and free from excessive ice buildup. Products stored on pallets must be frequently moved if on **racks** or shelving **12 inches off the floor**. All products to be stored in secondary containers and there should be no exposed product.
SANITARY PRODUCT HANDLING

**General:** Due to the nature of the finished product (poultry carcass) that is highly perishable the Poultry Harvesting Operation must enforce basic sanitary requirements during entire operation.

a. Sanitary poultry carcass harvesting and handling is an absolute must if the Branch is to accomplish its primary purpose of "Protecting the Health of the Public." Every effort must be made by each plant employee and Branch Inspectors to eliminate bacterial contamination of the meat produced and to prevent the growth of those bacteria that are unavoidably present in or on the product.

b. Each plant is an individual problem. Due to the variety of poultry slaughtered and different layouts of each plant there are no exactly set of rules formulated to cover every situation which the inspector may encounter. **Poultry Meat Inspector** must use their ingenuity, keeping in mind those facts concerning bacteria as set in Microbiology section of this manual, how they affect the product, and the possible effect on the consumer.

c. In order for the **Poultry Meat Inspector** to effectively carry out his duties, he must familiarize himself with every aspect of the operation under his jurisdiction: the physical layout of the plant; equipment in use and how it operates; proper stunning methods, bleeding, defeathering and eviscerating techniques as well as proper marking and distributing of the finish product cuts to the customers; in fact, anything and everything that may have some effect on the sanitary quality of the final product.

The **Poultry Meat Inspector** is responsible for inspecting every aspect of production and to set an example for other coworkers to follow, from stunning, sanitary bleeding and eviscerating procedures, as well as sanitary inspection, cutting and marking according to regulations and sanitary distribution of the poultry carcass or poultry product to the consumers. Regular food safety and sanitation training is highly recommended for all production workers.

d. The major factors contributing to filth and poor sanitation in a poultry plant are:
   - Human behavior
   - Personal hygiene
   - Improper dress
   - Worker health
   - Inadequate supervision of personnel (work habits)
   - Flies, rodents and other vermin
   - Dirty equipment and utensils
   - Insanitary procedures
   - Improper handling, and distribution of poultry product cuts or parts of carcasses
   - Insanitary toilets and dressing rooms

e. In order to maintain wholesome and sanitary production of poultry carcasses and poultry, the **PMI** must pay attention to the following:
1. Inspection of all poultry/carcasses/viscera.

2. Sanitary handling of poultry carcasses/poultry products.

3. The maintenance of plant and product sanitation during the operation and distribution.

4. Exercising control over personnel regarding personal hygiene, sanitary work habits, and cleanliness of dress.

5. Detection and elimination of possible sources of contamination and possible cross contamination.

PRODUCT HANDLING AND SANITATION

Establishments need to control their operations to prevent contamination of product with pathogens during entire operation.

Cross-contamination of product can occur from situations such as the following:

1. Use of the same equipment without cleaning and sanitizing for longer than 5 hours or after being used on other species.

2. Using the same utensils or containers (e.g., buckets, gondolas) for different poultry species without cleaning and sanitizing between species.

3. Condensation or dusting

In addition to equipment sanitation, the establishment should address the following sanitation issues:

1. Employee hygiene - washing hands upon resuming duties after breaks and before putting on gloves.

2. Wearing separate or color-coded frocks in outside and inside areas of the plant.

3. Training employees in proper hygiene practices, and monitoring their practices.

4. Restricting movement of personnel to and from clean and dirty areas.

EMPLOYEE PRACTICES

1. Employees with diagnosed communicable disease (like tuberculosis, which is transmissible from person to person or by indirect means), shall be excluded from the food facility/preparation of food.
2. Gloves shall be worn if an employee has cuts, sores, and rashes.

3. No employee shall commit any act that may contaminate or adulterate food, food contact surfaces, or utensils.

4. No employee shall eat, drink, or smoke in any work area.

OPERATIONS

1. Hand washing soap shall be provided in dispensers, dispensers to be maintained in good repair.

2. All chemical substances such as detergents, bleaches and other cleaning compounds shall be stored separate and far away from production area, utensils, packaging materials and food contact surfaces.

3. Food contact surfaces/ utensils shall be cleaned and sanitized each time there is a change in livestock species or contamination occurred.

4. All plant employees are required to wash their hands
   a. Before beginning work
   b. Before handling food/equipment/utensils
   c. As often as necessary, during preparation to remove soil and contamination
   d. When switching from working outside to inside plant
   e. Any time contamination may have occur
   f. Upon entering the prior to handling product.

5. All employees preparing, serving or handling food or utensils shall wear clean, washable outer garments or uniforms.

6. All employees in food areas that contain exposed product direct contact surfaces shall wear a hairnet, cap, or other suitable head covering to confine hair.

7. Gloves shall be worn if any employee has artificial nails, nail polish, or fingernails that are not clean and neatly trimmed.

PRODUCT RECONDITIONING

The majority of product/products that are accidentally or incidentally soiled (not contaminated) may be reconditioned if acceptable procedures are written, verified and the required facilities are available and properly utilized.
After you read the chapter “Sanitation” – please answer the following questions:

1. What are the plant management responsibilities related to sanitation?
2. What are the plant Poultry Meat Inspector responsibilities related to sanitation?
3. What are the Sanitation Standard Operating Procedures (SSOP) and Sanitation Performance Standards (SPS)?
4. What is a function of a Poultry Meat Inspector related to sanitation?
5. Define cleaning.
6. Define sanitizing.
7. Name a few approved cleaning tools.
8. Name a few cleaning tools that are not approved to be used at a licensed poultry plant.
9. Name a few detergents commonly used in a poultry plant cleaning process.
10. Name a few sanitizers commonly used in a poultry plant.
11. Describe the main steps of plant cleaning and sanitizing procedures.
12. What principles guide the cleaning of the non-production area?
13. What are the requirements of poultry product handling in the plant?
SECTION IV - INSECT and RODENT CONTROL

No matter how small or big plant is or how old or new plant is, a Pest Control program must be implemented in each plant. Management is responsible for ensuring that a Poultry Processing/Slaughter Establishment has an effective pest control program that is monitored and documented.

The Poultry Meat Inspector is responsible for inspecting for the presence of or evidence of insects and rodents or any other pests in the plant, both during the preoperational inspection and during operations. The PMI should look for flies, evidence of cockroach infestation (look in cracks, crevices, electrical boxes and panels, etc.), rodent feces along floor-wall junctions, etc. If he or she detects a pest problem, the PMI must take whatever action is necessary to insure that the identified problem is remedied by plant management. This could include retaining affected product, suspending operations while the problem is addressed, rejecting affected areas and/or equipment, and alerting the Branch to deficiencies in the plant pest control program. The PMI must also inspect to insure that only approved methods of pest eradication are employed and that every precaution is taken to prevent contamination of product with pesticides.

RODENTS IN GENERAL

- Rodents have been responsible for more human illnesses and deaths than any other group of mammals.
- They spread diseases, directly by contaminating human food with their urine or feces, or indirectly, by way of rodent fleas and mites.
- Rodents cause enormous economic loss.
- They consume or contaminate vast quantities of food and animal feed.
- They destroy property.

EVIDENCE OF RODENTS

- Rodent droppings in the plant and outside and nests and burrows (outdoor nesting sites, trash dumps, or piles or rubbish).
- Gnaw marks (hole gnawed through a building or in products; old rat holes will be smooth from use, new ones will be rough with splintered edges).
- Urine stains, observed as fluorescing under an ultraviolet light; and characteristic musty odor.
RODENT CONTROL

- MPES Branch has implemented regulations on rodent and pest control.
- The regulations specify that every practical precaution *shall* be taken to exclude pests from official establishment. Those pests that do gain entrance *shall* be eliminated in a safe manner.
- The effective control of pests is by proper exclusion and sanitation (often backed up with appropriate chemical treatments).
- These controls are necessary to ensure a sanitary environment for producing safe and wholesome meat and poultry products.
- *Pest control* means those physical and chemical methods used to control pests.

**Methods** used to **prevent or eliminate** pest infestation.

- The physical or primary controls
  1. *Construction*
  2. *Maintenance*
  3. *Exclusion, and*
  4. *Sanitation*

The chemical or secondary controls refer to pesticide applications and the use of traps and other devices to supplement the primary controls and thus prevent infestation and eliminate or control established ones.

An integrated pest control program incorporates both the primary controls of pest infestation prevention and the secondary controls of pesticides and pest-controlling devices.

EPA regulate (through the Federal Insecticide, Fungicide, and Rodenticide Act) the registration of all pesticides.

**PRIMARY CONTROLS**

- **Sanitation.** A sound sanitation program removes the food and water supply that attracts and supports a pest population. It also eliminates the debris that provides nesting and hiding places.
**Construction.** A sound construction program creates a barrier that prevents pest entry. It also impedes or stops their movement within the building.

There should be tight fitting screens on windows, self-closing tight fitting doors, vestibules (two doors with a small room in between), air screens, and other such exclusionary devices. There should not be gaps around pipes or conduit entering the building or other holes where pests might enter.

**Maintenance.** A good maintenance program ensures that breaks in the construction barriers are promptly corrected. Maintenance must close cracks and crevices in inner and outer surfaces to prevent access to pests.

**Exclusion.** An exclusion program prevents pest entry through the necessary openings (doors, windows, etc.) in a building.

If there are sound sanitation, construction, maintenance, and exclusion programs enforced in the plant, insects and rodents inside the plant should not be a problem. However, if pests gain entry to the plant interior, prompt and approved measures must be taken to get rid of them.

**SECONDARY CONTROLS**

- If necessary, approved chemical pesticides can be used both inside and outside the plant. They must be handled and applied by competent trained plant personnel or by commercial pest control firms. Because of the extreme risk of chemical contamination of product from pesticides, they must be approved for the intended use, handled and applied according to label instructions, and properly stored.

- Residual insecticides not only kill when they are applied, they also deposit a residue that has a prolonged lethal effect.

- Baits, pallets, and powders. Sugar baits and tracking powders may also be used in inedible areas and on outer premises. They *must* be distinctly colored blue or green to preclude confusion with food ingredients.

- Automatic systems. Automatic insecticide systems may only use non-residual insecticides.

- These systems are allowed in processing and storage areas, provided the dispenser is operated only when products are not being processed or stored in open containers.
When the system is in use, product in the affected rooms must be covered to prevent falling insects or spray residue from contaminating them.

After dispensers have been used, all utensils and equipment must be thoroughly washed with an effective cleaning compound and rinsed with potable water to remove dead or dying insects or residues that may remain on any surface before operations begin.

The automatic system may be in use without time limitations, provided that sufficient precautions are taken to preclude entrance of insecticide mist or affected insects into work areas via open windows, ventilating systems.

Rodenticides. In general, rodenticides may not be placed in edible product departments until operations have ceased for the day and all uncovered products are removed from the area. These baits come in two forms, liquid and dry.

Liquid baits may be used in bait fountains provided the solution has a distinct green color. These fountains are housed in bait boxes.

Dry baits are usually mixed with cereal or other vegetable meal. These baits must be an obvious blue or green color.

Chemicals (pesticides) must not be allowed to become the plant’s primary insect and rodent control tool. They are poisons and, therefore, can result in dangerous chemical contamination of product. Also, pests can sometimes bypass the poisons or become resistant to them.

Rodent baits must be approved and must be in approved bait boxes. Strict account must be kept of the location and number of bait stations and the locations must be approved by the Branch. Sticky boards and traps may be used in all departments provided their use does not create a nuisance.

PEST AND RODENT CONTROL PROGRAM

If the plant has an integrated pest control program, it should be on file.

The plant’s written program should designate a responsible plant employee.

The program should include sealing all openings or holes where vermin may gain entrance, eliminating harborage, using bait boxes, and surveying the premises on a weekly basis.

A contract with a recognized extermination firm (if applicable) or an effective plant program.
A map should be on file showing the actual locations of all pest control devices (bait boxes, ketch-alls, sticky boards, fly zappers, etc.) on the official premises.

PEST IN PRODUCTION AND RELATED AREAS

- The production and production-related areas shall be properly maintained for pest control.
- No bait boxes or tracking powder are in evidence during operations. Tracking powder is illegal in the state of California.
- No evidence of pest or rodents is noted during an inspection specific to this task.

PESTICIDE/RODENTICIDE LABELS AND USE

- An up-to-date list of pesticides currently being used on the official premises needs to be maintained by the plant and kept on file.
- Pesticide labels should be reviewed to determine if the pesticides are properly identified, EPA-approved, used as stipulated on the label, and that this use is in accordance with MPES Branch regulations.

PESTICIDE/RODENTICIDE STORAGE

- Pesticides and rodenticides that are stored on the official premises need to be in a designated area or in locked cabinet.
- This area is to be properly maintained to ensure good sanitation.
- The poisons must be in closed containers and properly identified.

*Non-chemical methods of trapping or killing insects and rodents are preferable to chemical use. These include electric insect traps, glue boards, mouse or rat traps, sticky strips or strings, etc. If used, the location of these devices must be identified on a plant diagram, they must be routinely monitored and cleaned and/or replaced.*
After you read this chapter, “Insect and Rodent Control”, please answer the following questions:

1. Who is responsible for ensuring that each Poultry Establishment has an effective pest control program?
2. Name a few common pests that most Poultry Establishments have to control.
3. Why must an effective pest control program be implemented at each Custom Livestock Slaughterhouse?
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SECTION V - DUTIES AND RESPONSIBILITIES IN CDFA LICENSED POULTRY ESTABLISHMENTS

A. **Duties of Management**

1. Complete and have on file a current Schedule of Operations (Form 79-038). Notify the Branch inspector sufficiently in advance if there is any change in the schedule of operations.

2. Maintain and make available to the PMI the name and address of each customer who poultry slaughter service was provided to.

3. Provide assistance to the PMI or Branch Inspector to conduct routine inspections, ante-mortem if needed and post-mortem inspections.

4. Provide conditions (water, food, cleaned cages etc.) that insure all poultry can be handled in full compliance with humane handling and humane slaughter laws.

5. Provide needed manpower and equipment to handle live poultry prior slaughter, conduct poultry processing according to the current California laws, and store poultry carcasses and parts in a manner that will prevent any contamination or adulteration of product.

6. Insure adequate trim of visible contaminants from poultry carcasses and parts in a manner that will effectively remove any contamination and will prevent further contamination.

7. Follow the instructions of the PMI or Branch Inspector in the disposition of poultry and of poultry carcasses and parts.

8. Develop, implement and maintain the Sanitation Standard Operating Procedures (SSOP) in the plant.

B. **Duties of Poultry Meat Inspector (PMI)**

1. At least one PMI is to be present on the plant premises when poultry slaughter is occurring.

2. The PMI shall restrict plant operations to the days and hours specified on the plant Schedule of Operations (Form 79-038), unless the schedule has been changed with approval of the Branch Inspector.

3. The PMI on duty shall conduct ante-mortem (before death) inspection of each individual poultry species that is required to receive ante-mortem inspection by law and shall conduct post-mortem (after death) inspection of all poultry (carcasses and viscera) harvested to insure
that only poultry that is wholesome and fit for human consumption will reach the consumer. All inspections must be conducted according to current laws.

4. The PMI must insure that all poultry are handled humanely and they are killed according to the humane slaughter act and regulations.

5. The PMI should inspect to insure that sanitary dressing and handling procedures are being followed by plant personnel. This is critical to prevent contamination of product in the plant. If the PMI detects problems in this area, he or she must retain affected product pending its disposition, notify plant management of the problem, and make sure the problem is addressed and corrected.

6. The PMI shall supervise addressing of any contamination on poultry carcasses and/or parts and then re-inspect such carcasses and parts to insure that no contamination remains.

7. The PMI may use green Cal Retained Tags on product and Cal Rejected Tags on facilities and equipment. The PMI may remove the tags after re-inspection of the tagged items.

8. The PMI shall insure containers holding poultry harvested in the plant and passed as wholesome are properly labeled as required by law.

9. The PMI shall inspect to insure that carcasses and parts condemned on post-mortem inspection are denatured with an approved denaturant in a manner that will prevent them from being used for edible purposes.

10. When needed, the PMI will assist the Branch Inspector in collecting samples for laboratory tests.

11. The PMI should report to Branch Inspector all incidents of noncompliance with any of the laws or requirements.
After you read this chapter, “Duties and responsibilities in CDFA licensed poultry establishments”, please answer the following questions:

1. What are the main duties of management in the poultry establishment?

2. What are the main duties of the Poultry Meat Inspector in the poultry establishment?
SECTION VI - FORMS AND MARKINGS USED IN POULTRY ESTABLISHMENTS

A. **Schedule of Operations (Form 79-038)**

Contains current days of the week and hours of operations in plant. Completed by plant management whenever there is a permanent change in schedule of plant operations.

B. **Sanitation Standard Operating Procedures (SSOP) - Clean-Up Procedures**

Cleaning and sanitizing procedures used in the plant before and during operations shall be described in detail as a part of plant SSOP. The SSOP must be developed by plant management to prevent product contamination. Detergents, sanitizers, and cleaning tools used in the plant should be listed and described how they are used. SSOP should be reviewed periodically by plant management, PMI, and Branch Inspector to keep it current.

D. **Daily Sanitation Report (Form 79-034)**

A sanitation inspection (pre-operational and operational) must be completed by the PMI on duty on each day of plant operations and findings must be recorded on check list as required by SSOP.

   a. Mark A for Acceptable, N for Needing Improvement, U for Unacceptable, or NA for Not Applicable in the box for each item under the date of inspection.

   b. Remarks Area - Note items that need to be cleaned, repaired, replaced, etc. that do not have to be addressed prior to start of operations but will need to be taken care of after operations or placed on a long term maintenance schedule. Example: A burned out light bulb.

As a part of plant SSOP, pre-operational and operational check lists must fully reflect current plant setup and must be unique to each plant’s operations.

F. **Daily Report of Poultry, Rabbits, and Ratites Inspected (Form 79-060)**

Detailed information of all poultry slaughtered and further processed in the plant during each day of operations should be provided. Completed by plant management.
G. **Monthly Summary—Poultry, Rabbits, and Ratites Slaughtered (Form 79-061)**

This form should be completed each month by PMI or plant representative and should contain all added slaughter information from Daily Report of Poultry, Rabbits, and Ratites Inspected (Form 79-060) of the month. Original given to Branch inspector or sent to Area Office and copy retained in plant file.

H. **Sample for Laboratory Inspection (Form 79-185)**

1. Submitted to laboratory with collected sample

I. **Plant’s Approved California Identification Number and Mark of Inspection**

Each official poultry establishment must have assigned identification number. An official mark of inspection (sufficient size and color) shall be used, when required, on labels of inspected and passed poultry carcasses and parts and poultry product in a licensed poultry plant. The mark of inspection is in the form of a cross and the wording should be read as follows:

**INSPECTED FOR WHOLESOMENESS UNDER SUPERVISION CALIFORNIA DEPT. OF FOOD AND AGRICULTURE.**

J. **Rejected/Retained Tag (Red) (Form 79-028)**

This is used to tag unsanitary or otherwise unsatisfactory equipment or facilities (Rejected) or to hold product pending re-inspection and disposition (Retained). It is applied and removed, following re-inspection and disposition, only by a Branch employee.

O. **Rejected/Retained Tag (Green) (Form 79-026)**

This is used to tag unsanitary or otherwise unsatisfactory equipment or facilities (Rejected) or to hold product pending re-inspection and disposition (Retained). It is applied and removed, following re-inspection and disposition, by a Branch employee or a PMI.
After you read this chapter, “Forms and markings used in poultry establishment”, please answer the following question:

1. Please explain all forms used in licensed poultry establishments.
SECTION VII - SANITARY PROCESSING

Conducting sanitary operations that follow all required procedures is a crucial aspect in the production of wholesome ready-to-cook poultry meat. It does little good to start with a clean sanitary plant and equipment, and to perform a perfect job of inspection of the product, if unsanitary practices in the plant's operations are permitted to exist.

Sanitary poultry operation can be defined as killing and processing poultry in a manner that prevents contamination of the carcass and parts with fecal material, ingesta, or anything else that might contain physical, chemical, or microbiological hazards. This is probably the most critical element in producing a safe wholesome product. Keeping a plant in perfect sanitary condition is ineffective if workers are untrained, unskilled, and careless in the dressing of poultry.

It is the responsibility of the PMI to know what are and are not sanitary procedures and to inspect during the course of operations for improper techniques that may cause contamination of product. The PMI must also know how to deal with contaminated product when it is discovered. When the PMI detects such a problem, he or she must take appropriate action to protect product and to insure that the error(s) is not repeated. This might include discussing the observations with the worker(s) involved, explaining or demonstrating correct technique, directing the trimming of contaminants off of the product, retaining product if necessary, notifying management of the problem, etc.. The PMI must use his or her best judgment in how to handle the situation, keeping in mind the fundamental principle of protecting product from contamination. It is recommended that all processing procedures are conducted by licensed PMIs. However, after being properly trained and under PMI supervision, most processing procedures can also be conducted by unlicensed plant workers.

Slaughtering and Evisceration

**Stunning and Slaughter Cuts:** Poultry covered by the Humane Slaughter of Poultry regulations must be handled, stunned, and bled by approved methods. The killing or slaughter cut for all poultry must be made in a manner that will result in minimal pain and struggle and complete bleeding of the carcass. Both carotid arteries should be cut rapidly and simultaneously. This results in almost immediate unconsciousness. Sharp implements must be used in making slaughter cuts. Pulling the head off is not permitted. Rough edges from dull blades and stretching of the arteries and veins results in premature coagulation and inadequate bleeding.

It is recommended that birds should be removed from feed a sufficient time before slaughter to prevent potential contamination of the neck tissue by esophageal or crop contents. Such contamination is extremely difficult to remove.
Bleeding Time: Birds should be completely bled out and breathing must have stopped before entering the scalder. Remember the respiratory system of birds and how extensive the air sacs are. If the bird is still breathing when it enters the scalder, it will suck the scald water into the respiratory system. Birds that have been permitted to enter the scalder alive have later been dissected (cut into parts) and scald water has been found in the wing joints and wing bones and even in the breast muscles. The heat in the scald water is not sufficient to destroy bacteria and the water is constantly being seeded with bacteria-laden material so all carcasses from birds that enter the scald tank alive must be condemned as unfit for human consumption. Bleeding time has a very definite effect on wholesomeness of the end product. Generally, a bleeding time of 90 seconds prior to the bird entering the scalder is considered sufficient for fryers with a correspondingly greater length of time being required for heavier birds. Of course, the real requirements are that the bird must be completely bled out and have stopped breathing before entering the scald water.

Scald Water: If large number of birds are slaughtered and a relatively small scalder is used, it is recommended that water in this scalder is changed often but at least twice daily. The necessity of these requirements becomes readily apparent when the inspector thinks of the materials that enter the scalder - blood, feathers, dust, dirt and fecal matter. Scald water is very rapidly seeded with heavy loads of bacteria. When one thinks of the scald water, it is easy to understand why it is required that birds that have been mutilated in subsequent picking be condemned, and why it is required that dressed birds be washed prior to making any eviscerating cuts, including the removal of the feet.

“New York dressed” is a term for poultry that seems to have appeared about 1902. It is poultry that is "rough plucked," with the feathers removed and the blood drawn, but with the head, feet and entrails (internal organs) intact.

Singeing: After picking and before the NYD bird wash, carcasses may be singed (exposed to flame) in a manner that will result in complete removal of hair from the finished product.

New York Dressed Wash: Dressed carcasses must be washed either by passing them through a system of sprays of fresh clean water under pressure or under clean flowing water utilizing a scrubbing action.

New York Dressed Holding Tanks: In smaller plants where it is desired to hold dressed birds in tanks of water, this may be permitted provided that the dressed carcasses have been vented (milking out the vent to remove any fecal matter that might be present) prior to the NYD wash and further provided that a supply of fresh clean water is added to the tanks at all times while in use. The water in NYD holding tanks should be clear and free from floating debris at all times. There is no minimum time set for how long dressed carcasses may remain in NYD holding tanks, but they should be removed as rapidly as possible consistent with good plant operations. It must also be remembered that the chilling times as set forth in the regulations must be complied with.
**Feet Removal:** Feet may be required to be removed prior to inspection. This permits the inspector to examine the hocks for evidence of synovitis (characterized by pus fluid that can be squeezed or milked from the hock joints). The removal of the feet must not be accomplished prior to the NYD bird wash or, if NYD holding tanks are used, before carcasses are removed from holding tanks. Removal of the feet before washing the carcasses and/or placing in holding tanks will cause the fluid to be washed from the hock joints making it impossible for inspectors to detect evidence of synovitis. This also permits the exposed hock joints and tendon sheaths to become contaminated by the wash water or the water in the holding tanks. Feet are removed by cutting through the joint so as to expose the joint tissue.

**Opening Cuts:** It is essential that opening cuts be made in a manner that will prevent fecal contamination and the excessive absorption of moisture. If intestines are cut while opening cut is made, the body cavity of the bird will become contaminated with the intestinal contents. The contents of the intestines are digested, or partially digested, materials and have the same characteristics as fecal matter. If the area between the rib cage and thighs is opened, pockets are formed which catch and hold debris resulting from the washing operation. If the cut is longer than necessary for vent removal, moisture accumulates between the back and skin.

**Bar Cut:** When the bar cut is permitted, extreme care must be taken to prevent contamination of the fat surrounding the vent area and the bar. In making the bar cut, the vent is circled and the transverse cut is made high enough above the vent to leave a skin strap or “bar.” The vent is then pulled out with three or four inches of the intestine and milked out under a spray of water and the resultant contaminants washed away. The vent is then pushed back into the body cavity and bought out over the bar. Drawing is then accomplished through the opening made by the transverse cut. When the bar cut is allowed, inspectors should be particularly alert to detect contaminated fat around the vent area and on the bar and to trim away any contaminated tissue found.

**Drawing:** The term "drawing a chicken" means to cut the foul open and remove (draw out) the entrails. The removal of the viscera (drawing) must be accomplished with care. Careless drawing can result in the thigh areas being torn. If the operator pulls too sharply, the intestines may be torn resulting in the contamination of the body cavity with fecal material; livers may be crushed which requires that they be condemned.

**Giblets:** If harvested, they should be trimmed and washed immediately after they are removed from the body cavity. The practice of piling giblets with the viscera for later harvesting is a very unsanitary and not recommended as gizzard fat and livers become easily contaminated. In addition, it is very likely that the time and temperature requirements for chilling giblets will not be adhered to.

1. **Hearts:** Properly trimmed hearts have had the pericardial sac (heart sac) removed and the cap containing the main blood vessels trimmed away. After trimming, the heart should be washed and any blood clots remaining removed in the wash.
2. **Livers**: Livers should be removed by cutting through the tissue which connects them to the viscera. The properly trimmed liver has had the bile sac and connective tissue removed. It often happens that when hearts are removed from the viscera the pericardial sac (heart sac) remains attached to the liver, this should also be removed.

3. **Gizzards**: Operators should use care in opening gizzards and removing their contents to avoid contamination of the gizzard fat. In the event this fat does become contaminated, it should be stripped from the edible tissue and the gizzard washed. Gizzards should be trimmed to remove all portions of the intestines attached thereto. In some plants it is the practice to remove the gizzard and pass it on to another operator for opening and cleaning. This is not a good practice, but if it is done, the gizzard should be removed by cutting through the sphincter muscle just above the proventriculus (stomach). This will help to prevent the gizzard contents from draining back onto the fat. Gizzards should never be accumulated for later cleaning. After trimming, cleaning, and rinsing, the gizzard skin should be removed immediately. Remember the inner skin, or lining, has been in contact with the contents and these contents are partially digested matter and as such have all the properties of fecal material.

**Viscera Removal**: Final removal of the viscera must be accomplished in a manner that will insure removal of all the viscera and will prevent fecal contamination by intestinal contents.

1. **Sex Organs**: The testicles must be removed in all male birds. The ovaries in young female birds need not be removed provided they are not diseased or have not reached the "cluster" stage, or stage of maturity, where developing ova (eggs) are visible.
2. **Lungs**: There are several methods used for the removal of lungs from ready-to-cook carcasses. Some plants use lung rakes, some vacuum guns, and in some plants the lungs are removed by the drawers when the bird is drawn. Regardless of the method used, all of the lung tissue must be removed from the ready-to-cook carcass. Remember the lungs are full of blood and thus are subject to very rapid spoilage.
3. **Cropping**: The crops with their contents must be removed in a manner that will prevent contamination of the edible tissue. The esophagus and trachea (gullet and windpipe) should be removed with the crop. When cropping is accomplished, the area at the junction of the neck and body of the eviscerated carcass must be opened sufficiently to permit the free and rapid drainage of the inside wash water from the body cavity.

**Final Wash**: A thorough and effective final wash of the inside and outside of the carcass is very important and necessary.
After you read this chapter, “Sanitary processing”, please answer the following questions:

1. Define “sanitary poultry operation”.
2. Describe the correct stunning process.
3. What is the minimum sufficient bleeding time for birds?
4. What is the function of the scald vat and rules applying to bird scalding?
5. What is New York dressed poultry?
6. Describe the feet removal process and opening cuts procedures.
7. What is drawing?
8. What are giblets and how are they harvested correctly?
9. What are the required steps to follow in the process of viscera removal?
SECTION VIII - WHOLESOMENESS AND CONDITIONS

Definitions

"Wholesome" means that the poultry or poultry meat is free from all of the following:
(a) Physical evidence of any disease which is injurious to human health.
(b) Diseases or conditions which have rendered or would render the poultry meat unsuited for human food.
(c) Serious destruction of the flesh by disease or injury.
(d) Contamination by any substance which is injurious to human health.

"Dressed poultry" - slaughtered poultry with head, feet and viscera intact and the feathers and blood have been removed.

Inspection for wholesomeness: It is important that all diseased carcasses and/or parts be detected by the inspector and condemned. The proper technique may be varied according to the type of plant operations, but the technique used must result in a thorough inspection of each carcass. To be effective, the technique must become a routine habit with the inspector. It is also important that the inspector use care and good judgment in his work to prevent the condemnation of wholesome poultry products.

Please read below description of examples of common conditions and diseases that can be found on the poultry during postmortem inspection as well as judgment call on each condition.

a. Bruises: All flesh is composed of cells. When flesh is bruised, small blood vessels are broken, the flesh cell walls are ruptured, and the blood diffuses through the cellular structure of the meat. Blood stays inside meat tissue and can’t be washed away. It becomes an ideal media for the growth of bacteria and the broken cells permit their easy invasion. Therefore, all bruised tissue and/or parts must be condemned. In the event that the bruising is so extensive that the entire carcass or big part of it is affected (reddish color of flash), the entire carcass should be condemned.

b. Misbleed or "Pink": The misbleed, or so called "pink," is a carcass that has not been completely bled. A noticeable amount of blood stays in blood vessels instead of being removed during bleeding process. This gives the carcass the pinkish appearance. The poultry may have died by means other than slaughter, usually by drowning in the scalding. Such carcasses are subject to rapid spoilage. In addition, many people object, on religious grounds, to eating meat from which the blood has not been properly drained. Such carcasses are always condemned as unfit for human consumption.

c. Mutilated Carcasses: Carcasses that have been mutilated (having a part of the body slashed or torn) must be carefully inspected before carcass condemnation or, if not too extensive, have the mutilated flesh trimmed away and condemned. The final decision will depend on scope of the mutilation and information revealed by inspection showing at which stage of dressing the
mutilation happened. Bacteria are present in large numbers in the feathers of the birds, in scalders, on pickers and on workers' hands and equipment and when carcasses have been mutilated, the bacteria and filth have easy access to the flesh and get into the subcutaneous tissues. At this stage they cannot be effectively washed away or treated any other way. Areas of the poultry carcass where the skin has been broken during any of the dressing operations must be considered as mutilated and judge accordingly.

d. **Broken Bones:** Bone splinter is a fragment of a bone that can penetrate or purposefully inject into other part of body and create a health hazard. This is especially true in the case of the very old and in very young children. A broken bone that shows evidence of bruising (blood in surrounding tissue), must be considered as a bruise. Splintered bones, broken bones accompanied by bruising, and broken bones that protrude through the skin, must be removed by trimming at the next joint between the body and the break, and condemned.

The practice of breaking down or flattening out the rib cage (usually done with turkeys with poor conformation) to give a carcass a better appearing conformation is prohibited as this results in the splintering of the ribs. This is also a form of fraud against the public.

e. **Breast Blisters:** Breast blisters are often full of pus and bacteria, many of the food poisoning variety. These blisters must be trimmed and condemned. Care must be exercised in the trimming of these blisters to avoid contaminating the flesh with the contents of the pouch of the blister. The very small dry callus need not be trimmed. The rest of the carcass after blisters were carefully trimmed can be passed as wholesome.

f. **Swollen Hock Joints:** Hock joints that are swollen and/or have a pus colored fluid in them should be trimmed by removal at the thigh and leg joint. If that joint shows no further involvement, the remainder of the carcass may be salvaged. If both hock joints are involved and removal of the legs show no involvement beyond the hock joints, the remainder of the carcass may be passed as wholesome. A swollen hock joint in conjunction with a breast blister, a swollen liver, a deterioration of body condition, or any one of these conditions is an indication that the disease has progressed beyond the hock joints and has become generalized throughout the carcass. Such carcasses should be condemned. The pus, straw or cream colored fluid, is often filled with bacteria. The inspector should not confuse this pus fluid with the excessive fluid (either clear or tinged with blood) that may have been caused by birds being confined for too long a period at close quarters on trucks.

g. **Air Sac or "CRD" Disease:**

1. A normal air sac is formed by a thin, transparent membrane which may show deposits of fat or may have a cloudy, translucent (clear) appearance on the internal carcass surface.
2. A simple involvement of the air sacs is indicated by a cloudy or smoky appearance and a thickening of the membranes without a visible accumulation of exudates (pus). Carcasses with such involvement can be passed as wholesome provided that the carcass is of good color and good flesh.

3. In carcasses showing only evidence of a moderate inflammation, the legs may be passed when all exudates are found to have undergone solidification, and provided that the carcass is of good color and good flesh. If the carcass is of poor color or dehydrated, the entire carcass shall be condemned.

4. When only the posterior thoracic and/or abdominal air sacs are involved and the carcass is in good flesh and good color, the carcass may be passed as wholesome after removal of the kidneys, exudates, and air sac tissue. If the air sacs are in the liquid or frothy stage of inflammation, the carcass is to be condemned. Drawer’s hands will smear this frothy exudates around the inside of the body cavity and, therefore, the carcass is contaminated.

5. Carcasses with air sac disease having large amounts of exudates or evidence of toxemia (characterized by distended blood vessels and redness of the skin) shall be condemned.

6. The above are only general guidelines in the disposal of carcasses with air sac disease. Conditions vary from flock to flock and it is impractical to describe air sac disease in all of its various ramifications. For example, the equipment available for salvaging carcasses will have some bearing on their disposition. The Branch Inspector is to be consulted in making disposition of carcasses affected with air sac disease.

h. Contamination: During the act of making the opening cuts and drawing poultry, the carcass often becomes contaminated with intestinal contents to a greater or lesser degree. The intestines of all animals are reservoirs of bacteria, some of which may be of the food poisoning variety or other disease producing varieties. In any event, carcasses contaminated with intestinal contents are subject to very rapid spoilage. When the fat, inside surfaces of the carcass, or any cut surface becomes contaminated with intestinal contents, such contamination can only be removed by removal (cutting off or trimming) of the affected tissue. It may be possible to wash away the visible contaminants, but the bacteria will cling to the exposed tissue and to the soft fat and cannot be washed away. Thus the only way that such contaminated tissue can be disposed of is by trimming and condemning the affected parts. During drawing, the bile sac is often ruptured. Bile is bitter tasting and tissue contaminated with bile fluid must be condemned. Carcasses that have been contaminated with bile fluid or intestinal contents only on unbroken skin surfaces may be salvaged by washing away the contaminants.

1. Volatile Oils, Paints, etc.: Carcasses contaminated with volatile oils, paints, lubricating grease, insecticides, etc., must be condemned or the affected parts condemned, depending upon the degree and extent of such contamination.
2. Inspectors that observe an abnormal number of carcasses being contaminated by the carelessness of employees, or by defective equipment, should notify supervisory personnel in order that the condition causing the contamination can be corrected and to prevent the condemnation of otherwise wholesome products.

i. **Overscald:** Carcasses that have been overscalded to the extent that the flesh takes on a "cooked appearance" must be condemned. Heat breaks down the cellular tissue of the skin and flesh and permits the easy invasion of bacteria. Remember this carcass has been through the scalder where uncountable millions of bacteria are present and, in addition, it has picked up loads of organisms from picking equipment and workers hands as well as from every piece of equipment it comes in contact with. Since the protective barrier of skin has been all but removed, the overscalded carcass cannot be effectively washed. Such a carcass will spoil very rapidly. Also the conditions existing in such a carcass are conducive to the growth of bacteria, some of which may be disease producers.

j. **Leukosis:** When bird carcass shows evidence of being affected with leukosis (even one sign of the disease is positively identified) this carcass and all organs must be condemned. This disease is sometimes characterized by enlargement of the reproductive organs. In the female bird the ovaries may be enlarged and have the appearance of a cauliflower. In the male bird the testicles may be enlarged, elongated, and have the appearance of having depressed rings around them. When the spleen and kidneys are affected, the spleen will be enlarged, the kidneys swollen, gray in color, and may show evidence of a well defined, light colored tumor. Occasionally this disease will affect the long bones of the body; namely, the thighs, shanks and the large bones of the wings. When the bones are affected thy will be greatly enlarged in circumference. (This is the disease listed in the regulations as "osteopetrosis" and is often referred to by those in the industry as "piano" or "elephant" leg). Another form of avian leukosis is that of numerous tumors on the skin. In more advanced stages of leukosis there may be tumors along the intestines and in any of the soft tissue in the body cavity. These many small tumors may have the appearance of light colored, gravelly masses. This condition is most often noted in old hens.

k. **Water Bellies:** This is the more common term used for peritonitis, which is an inflammation of the thin membrane that surrounds the viscera in an abdominal cavity. This inflammation has many causes, usually an infection of some kind. When this condition is present (usually seen in old hens), the inspector will note a large amount of water-like fluid that will almost gush from the body opening. Hence the term "water belly." This fluid will contain large numbers of bacteria and the entire inner surface of the carcass will be contaminated with these bacteria. Such carcasses must be condemned in their entirely.

l. **Giblets:** This is a culinary term for edible offal of a fowl, typically including the heart, gizzard, liver, and other visceral organs. As a part of the internal organ inspection giblets of each harvested poultry in a state inspected plant are required to be inspected on post-mortem by observation and palpation. More detailed procedures are required to be followed when specific giblets are harvested for human consumption.
1. **Livers**: Regulations list several conditions that require the condemnation of livers. Generally the inspector should condemn any liver that shows any abnormality. The liver acts as a filter of the blood in the animal and the liver that is swollen, scarred, abnormal in color, has small pin points of blood (petechial hemorrhages), well defined light spots, or any other abnormality, must be considered as diseased and be condemned. The liver also has another function, it stores fat. A fat liver is of a uniform, light, creamy color and will be of normal size and consistency except that it may be slightly softer than the non-fat liver and be more easily torn during drawing. Such livers are normal and should not be condemned. Livers that have become mutilated during the drawing or harvesting process should be condemned.

2. **Hearts**: The normal heart will be covered with a thin clear membrane and will have a collar of at around the cap. Conditions most often noted by inspectors requiring condemnation of the heart are a thickening of the thin membrane surrounding the heart, or the membrane is slimy and the fat around the heart cap and may be tinged with blood. These conditions are indicative of serious disease in the carcass and the inspector should make a careful examination of the entire carcass. It may be that he will find conditions that require condemnation of the whole bird. In any case, the heart must be condemned.

3. **Gizzard**: The specialized stomach constructed of thick, muscular walls used for grinding up food. When the heart sac and fat are found to be slimy, the fat of the gizzard may also be slimy and orange in color. Such gizzards should be condemned. Gizzards that are ulcerated or eroded should be condemned. The ulcerated or eroded gizzard is usually found only after harvesting and washing and the inspector has little opportunity to detect these conditions at the inspection station. Therefore, plant management should instruct personnel engaged in the harvesting, washing, and skinning of gizzards to discard all such gizzards noted. The inspector can make occasional checks of the prepared gizzards to assure himself that this is being done.

4. All the giblets from carcasses with evidence of leukosis or of air sac disease should always be condemned regardless of the disposition made of the carcass.

**m. General**: The above covers some of the more common diseases and conditions the inspector will encounter when performing post-mortem examinations of poultry. When the PMI encounters some condition with which he/she is unfamiliar, or not sure, he/she should hold the poultry until it can be examined by a Branch Inspector. Such poultry carcasses should be placed in a container and tagged with a "retained" tag and placed in a part of the cooler away from wholesome products. In emergency a Branch Inspector who regularly visits your plant should be contacted directly or call to the area office of the Meat, Poultry and Egg Safety Branch should be made.

*Remember, it is important that all diseased and/or contaminated tissue be condemned, but it is also important that the inspector does not discard healthy, edible tissue.*
n. **Ante-Mortem Inspection (AM) of Poultry:** Ante-mortem (before death) inspection of each individual fowl and small game birds is not mandated and is not conducted in most state inspected plants but may be required by the Meat, Poultry and Egg Safety Branch. It is always required for ratites (ostrich, emu, rhea) and for rabbits. Ante-mortem inspection is to be done by a licensed Poultry Meat Inspector (PMI) on the plant premises and all poultry showing signs on ante-mortem inspection of systemic disease are to be condemned or withheld from slaughter.

o. **Post-Mortem Inspection (PM) of Poultry:** Post-mortem (after death) inspection of all type of harvested (slaughtered) birds and rabbits (each individual poultry) at state inspected plants is mandatory. It must be done only by a licensed Poultry Meat Inspector (PMI) on the plant premises so only carcasses/organs fit for human consumption will reach the consumer. The PMI must use all known senses to try to detect any condition or disease that may affect final product.

**PM Procedures for Birds**

1. **Observe Carcass Exterior Surfaces** and look for the following conditions/changes:
   a. Breast blisters
   b. Leukosis
   c. Dehydration
   d. Overscald
   e. Misbleeds
   f. Toxemia/Septicemia
   g. Preen glands
   h. Feathers
   i. Contamination
   j. Mutilation / Broken Bones

2. **Observe Hock Joints** for signs of synovitis

3. **Observe and Palpate Viscera** (Heart, Liver, Spleen, Proventriculus, Gizzard, Intestines) and look for following changes:
   a. Exudates (Pus, watery fluid, etc)
   b. Enlargement
   c. Hemorrhage
   d. Tumors
   e. Contamination
   f. Processing Defects
4. Observe Inside of Carcass - Air Sacs, Lungs, Kidneys, Sex Organs, Body Walls and look for following conditions/changes:

a. Airsacculitis
b. Pneumonia
c. Exudates
d. Enlargement
e. Hemorrhage rf. Tumors
g. Contamination
f. Processing Defects
p. **Rabbits:**

1. **Ante-mortem Inspection:** While ante-mortem inspection is not always required on other classes of poultry, it is **always required on rabbits**. Many disease conditions in rabbits, not observable on post-mortem examination, can be noted while they are still alive. The healthy rabbit's eyes will be bright, the nose moist, the ears erect and in almost constant movement, the body fur smooth and glossy. The inspector looks for evidence of roughened fur, liquid fecal matter around the vent and rear legs. The sick rabbit's ears may lie flat, the eyes will be dull and his general appearance is one of droopiness, he will show little interest in what is going on around him. **If there is evidence of disease, the extreme cases should be destroyed and not allowed to enter the plant. Others showing signs of disease should be held back from slaughter and/or slaughtered last to avoid contaminating equipment and workers' hands and thus contaminating the wholesome carcasses.**

2. **Post-mortem Inspection:** This inspection is done to determine if rabbit carcass and its parts are fit for human consumption. PMI concerned with findings during this inspection should consult with the veterinarian assigned to their plant for specific instructions and guidelines for disposition of rabbit carcasses and parts. Several of the diseases and conditions listed in [Section 1250 of the Poultry Inspection Regulations](http://example.com) are applicable to rabbits only.

   a. **Observe all outer surfaces of carcass** for any sign of contamination, inflammation, abscesses and/or pus, neoplasms, cysts, lymph node enlargement, improper or incomplete dressing, etc.

   b. **Observe flesh** to determine proper bleeding, abnormal tone, cyanosis, etc.

   c. **Observe thoracic, abdominal, and pelvic cavities and diaphragm** to look for peritonitis, pleuritis, adhesions, abscesses, cysts, neoplasms, bruises, contamination, complete and proper dressing, tapeworm cysts, etc.

   d. **Observe kidneys** for presence of hemorrhages, necrotic foci, pitting, etc.

   e. **Observe and palpate all surfaces of the liver** and look for signs of cirrhosis, hemorrhage, abscesses, icterus, necrotic foci, tumors, coccidiosis, tapeworm cysts, etc.

   f. **Observe viscera (spleen, stomach, intestines, cecum)** and look for enteritis, peritonitis, neoplasms, tapeworm bladders, enlargement of the spleen, necrotic foci, hemorrhage, etc.

   g. **Observe and palpate heart and lungs** to look for any sign of pericarditis, pneumonia, abscesses, lymph node enlargement, contamination, etc.
After you read this chapter, “Wholesomeness and conditions”, please answer the following questions:

1. Define wholesome poultry.
2. Define the term “dressed poultry”.
3. Name and briefly describe the common conditions/diseases that can be found on in poultry during postmortem inspection.
4. What is antemortem inspection and in what poultry species is it required?
5. What is postmortem inspection and why is it required?
6. Describe the postmortem inspection procedure of rabbits.
SECTION IX - COOLING POULTRY

General: Rapid cooling of freshly processed poultry and poultry product is the most effective technique available to retard the growth of bacteria in poultry. All poultry shall be cooled immediately after processing. The golden rule is – the faster poultry or poultry product is chilled to an internal temperature of 40°F or below and kept there, the longer the shelf life of the poultry and poultry product will be.

Chilling is also one of the most dangerous processes in poultry harvesting operation. This is due to the fact that one contaminated poultry carcass can contaminate all the other carcasses in the chill tank (still the most commonly used and cheapest method to chill slaughtered poultry). For this reason, only properly inspected, trimmed and washed carcasses should be placed in chill tanks and only clean tanks should be used. The ice and water in the tanks must be changed and the tank cleaned whenever the contents appear unclean.

a. Ice and water chilling

1. Only ice manufactured or produced from potable water may be used. Sufficient clean, crushed ice shall be used to provide for rapid chilling of poultry.

2. Poultry carcasses weighing less than 4 pounds shall be chilled to 40 degrees F. or below in less than 4 hours; carcasses weighing 4 to 8 pounds shall be chilled to 40 degrees F. in less than 6 hours; and carcasses weighing more than 8 pounds shall be chilled to 40 degrees F. or below in less than 8 hours.

3. If poultry is to be held overnight in chilling tanks, the temperature of the ice and water must be held at 40 degrees F. or less. If held longer than 24 hours, the carcasses or parts must be repacked with crushed ice in continuously draining clean tanks.

b. Air chilling

1. Dressed poultry is to be placed in a refrigerated room with moderate air movement and a temperature which will reduce the internal temperature of the carcasses to 40 degrees F. or lower within 24 hours.

2. Ready-to-cook carcasses shall be reduced to an internal temperature of 40 degrees F. or lower within 16 hours.

c. Giblets - giblets shall be chilled to 40 degrees F. or lower within 2 hours from the time they are removed from the inedible viscera.
d. **Shipping**

1. If poultry is to be shipped from the plant in packaged form, it must be cooled to and maintained at a temperature of 40 degrees F. or lower prior to shipment.

2. If poultry is held in excess of 24 hours, it shall be held at 36 degrees F. or lower.

e. **Exception to the chilling requirements**

   *If poultry is slaughtered, dressed and/or eviscerated at a retail customer's order, while the retail customer waits for delivery, it can be removed (without being chilled) from the plant by the customer, providing that the package or wrapping bears, in conjunction with the inspection mark or label, the statement "The poultry meat contained herein has not been chilled, and therefore should either be chilled or cooked immediately."*

f. **Rabbits**

1. Dressed and washed rabbit carcasses are placed in a clean container containing continuously overflowing cold water. This rapidly reduces the internal temperature of the carcasses.

2. After being in the overflowing water for a brief period of time the rabbit carcasses are either air or ice/water chilled. *They must reach an internal temperature of 40 degrees or below within 24 hours.*
After you read this chapter, “Wholesomeness and conditions”, please answer the following questions:

1. Define wholesome poultry.
2. Define the term “dressed poultry”.
3. Name and briefly describe the common conditions/diseases that can be found on in poultry during postmortem inspection.
4. What is antemortem inspection and in what poultry species is it required?
5. What is postmortem inspection and why is it required?
6. Describe the postmortem inspection procedure of rabbits.
SECTION X - FURTHER PROCESSING

General: Further processing is defined as any process that changes the conformation or characteristics of whole bodied, eviscerated poultry or poultry product. Generally, further processing plants must meet the same sanitary requirements as those for slaughtering and eviscerating plants. In addition, further processing plants, depending on the type of operations and products produced, present some special problems to the inspector, some of which are dealt with in this section.

a. The sanitary handling and processing of further processed poultry products is an absolute must if the Meat, Poultry and Egg Safety Branch is to accomplish its primary purpose of "Protecting the Health of the Public." Every effort must be made to eliminate bacterial contamination of the products produced and to prevent the growth of those bacteria that are unavoidably present in or on the product. It must be remembered that cooking temperatures will not always destroy bacterial toxins.

b. Due to the variety of poultry processed and the production methods utilized, no set rules can be formulated to cover every situation which the inspector may encounter. Inspectors must use their creativity and knowledge – keeping in mind those facts concerning bacteria as set forth in Section II of this manual, how they affect the product, and the possible effects on the consumer.

c. In order for the inspector to effectively carry out his duties, he must familiarize himself with every aspect of the operation under his jurisdiction: the physical layout of the plant; equipment in use and how it operates; harvesting methods in use; any quality control methods in use; sources and methods of handling poultry; methods in use for the storage and distribution of finished products; in fact, anything and everything that may have some effect on the sanitary quality of the final product.

The Poultry Meat Inspector is responsible for inspecting every aspect of production, from the receipt of live poultry, sanitation and sanitary operating procedures, on through manufacturing processes until the final product is shipped from the plant.

d. The major factors contributing to filth and poor sanitation in poultry plant are:

Human behavior
Personal hygiene
Improper dress
Worker health
Inadequate supervision of personnel (work habits)
Flies, rodents and other vermin
Dirty equipment and utensils
Condition of produced raw poultry and their storage and handling
Unsanitary processing procedures
Improper storage, chilling, handling, and shipment of finished product
Unsanitary toilets and dressing rooms

e. The following are some possible sources of cross contamination in poultry plant:

1. Personnel working in or moving freely between areas in the plant where live poultry and finished products are handled.

2. Using the same equipment such as racks, knives, aprons in both areas without proper cleaning and sanitizing.

3. Combining equipment used in both areas during cleaning operations.

4. Moving contaminated material through the final processing area.

5. Inspectors should remember that the area where live poultry is handled is considered a contaminated area and should be isolated from the final processing area.

**Personnel** engaged in handling edible products must wear clean outer clothing, aprons and/or smocks. They must wear a protective head covering. Employees that handle edible products should not wear jewelry with settings, beads, dangling earrings, nail polish, etc. It is not uncommon to find ring settings, strips of nail polish, or a bead from a broken set of beads in a finished product. Employees must be required to wash their hands before reporting at their work stations, after visiting rest rooms, and after leaving their work stations for any reason. Workers' hands are among the most common sources of bacterial contamination of food products.

a. Personnel with infected cuts, open sores, and boils on their hands or exposed parts of their bodies shall not be permitted to handle edible products unless such cuts or sores are properly covered with some clean, moisture proof material that will protect the product from contamination. The worker with a boil on his neck will, from time to time, rub the sore and immediately return to handling the product he is working with. Many bacteria of the food poisoning variety can be found in such infected cuts and sores. These bacteria have also been found in the material expelled by persons with colds and coughs. For this reason, personnel with colds and coughs should be given work other than handling edible products until their condition has cleared up.

b. Regulations forbid the employment of any person with a communicable disease in a transmissible state in any department where poultry or poultry products are handled or prepared. If it is suspected that an employee is suffering from a communicable disease, the proper supervisor should be notified and the person should be required to consult a physician and not be permitted to return to work until the disease is cured or is no longer in a transmissible stage.
c. Supervisory personnel should be thoroughly trained, and in turn instruct all employees, in the need for all personnel to practice good personal hygiene and sanitary work habits. The inspector must set the example for all other employees in this. When an inspector notes infractions by employees of the above rules, the proper supervisor should be notified. If correction is not obtained, the Branch employee assigned to the plant should be notified.

Rodents, flies and Other Vermin: See Section IV of this manual. When it is necessary to spray for flies during plant operations, operations must be halted and all products removed from rooms to be sprayed or otherwise protected from insecticides and dead flies. After spraying, all equipment must be rinsed with hot water to remove dead flies and insecticide residue before operations are resumed.

Sanitation: See Section III of this manual.

Receipt, Inspection and Storage of Raw Poultry/Poultry Product:

a. All poultry carcasses and/or poultry meat received in the state inspected plant must have originated in a plant inspected by the State of California or Federal Inspection Service. Containers should be properly labeled and bear the inspection mark of the appropriate inspection service. Containers should be clean and in good condition. Enough of the boxes should be opened by the inspector to make sure that the contents are sound, wholesome, and free from contamination.

1. Poultry received into the official plant should be immediately stored in the cooler, or freezer if received in a frozen state. Storage should be arranged in such a manner that the oldest products in storage are used first. As the poultry or poultry meat is removed from storage for use, the inspector must again examine enough of it to make sure it is in a sound and wholesome condition.

2. If any poultry products are received from an unapproved source, it must be rejected and none of it allowed to enter the plant. If any are received in an unsound or unwholesome condition, the inspector should either condemn and denature it or require that it be loaded back onto the delivery vehicle for return to the supplier. In the latter case "retained" tags should be affixed to the containers, a record made of the tags, and a Branch employee notified.

Processing Procedures:

a. Inspectors must be alert to detect unsanitary work habits by employees. For example; the worker that will pick up refuse from around the work station and then return to handling the edible product without washing hands or workers who handle boxes, pallets, etc. and do not wash their hands before returning to work on the processing line. Frequent washing of worker's hands and aprons and sanitizing of hand utensils is a must in further processing plants. Remember, workers' hands are one of the most common sources of bacterial contamination in finished products.
b. Care must be taken to prevent products from remaining at room temperatures for excessive periods of time. Raw poultry should be permitted to remain at room temperatures for not longer than two hours before it is returned to the cooler or is included in the final product for immediate freezing or cooking.

c. When frozen poultry is thawed in water, it must be thawed in tanks with a continuous overflow of water. If the water is heated to speed the thawing, it must not be heated to a temperature of over 70°F. The continuous overflow of water provides some dilution of the numbers of surface bacteria on the carcasses.

When frozen poultry is thawed in air, this should preferably be done under refrigeration. If the poultry is thawed at room temperature, there will be uncountable millions of bacteria on the surface of the carcasses by the time they are completely thawed. Even when thawed under refrigeration, the carcasses must be thoroughly washed prior to inclusion in a product.

e. It is good commercial practice that poultry to be used in further processed items be thoroughly inspected. Any pin feathers, contaminated tissue and inedible portions of the carcasses must be removed and the carcasses be thoroughly washed prior to use.

f. Any method of deboning poultry carcasses must result in all of the bone being removed and inspectors should make frequent examinations of the boned meat to make sure that all bones are being removed.

1. When cooked boning is done, the operation must be conducted in a manner that will insure rapid handling of the meat and the entrance of the boned meat into coolers as rapidly as possible. These temperatures are within the ideal range for the growth of bacteria. The boned meat should be spread over shallow trays as it is stripped from the carcasses and placed in coolers as rapidly as each tray is filled. In no case may the boned meat be permitted to stand at room temperature longer than one hour after boning. Even this length of time is too long to be termed "good sanitary handling." If the meat is to be used in a product that is to be cooked or frozen, it may be moved directly to the area of such operations without chilling, provided the meat is used without undue delay and provided the product it is included with is either cooked, canned or frozen immediately after processing.

2. Raw boning operations should be conducted in a manner that will prevent the boned meat from rising above a temperature of 57 degrees F before it is either included in a product that is to be cooked, canned, or frozen or it is returned to the cooler to reduce the internal temperature of the meat to 40 F or below.
After you read this chapter, “Further processing”, please answer the following question:

1. What is further processing and what conditions must be met?
DISEASES AND CONDITIONS OF RABBITS

This chapter provides basic information about most common diseases and conditions of rabbits. However, there are more other conditions that may be found and observed during processing of rabbits.

GENERAL

Most rabbit’s diseases are not transmissible to humans.
However, there are many conditions which will render the meat unsavory or of poor quality.

Some diseases produce lesions or changes in the carcass which are easily recognizable by the ultimate consumer. Such conditions may or may not affect the quality of the meat. From an esthetic standpoint these diseases render the meat unsatisfactory and should not be passed for food.

Other diseases may not affect the taste or quality of meat and cannot be recognized by the ultimate consumer. Yet the consumer places his trust in the fact that this meat has passed inspection. For this reason the inspector should exercise integrity in making decisions regarding such cases.

All animals should be first examined ante-mortem (prior to slaughter) – see previous chapter.
In an effort to cover as thoroughly as possible the various disease conditions of rabbits, this discussion will approach the subject from the standpoint of anatomical systems, to include all major organs in the animal.

We will commence with diseases of the external portions, which are visible before opening the animal. This includes the following: diseases of the skin, bones joints, eyes, nose, anus, external genitals and mammary glands. The condition known as "emaciation" also belongs in this group.

Abscesses and Pimples. These are very common in rabbits. They are usually caused by Staphylococci (pus germs) or sometimes Pasteurella or other pus-producing bacteria. As a rule, they can be easily detected as lumpy swellings beneath the skin. When incised with a knife, a soft, cheesy white material is usually found. These may vary in size from that of a pinhead to swellings as large as an egg. The small "pimple-like" abscesses are more common in younger animals. They are frequently located on the inner portions of the legs and on the flanks and belly. Sometimes the infection may be found around the eyes, especially of young animals. The large abscesses are most commonly seen on the neck, beneath the jaws, but may be found any place on the body.

Sore Hocks. This condition may sometimes be found in conjunction with abscesses and pimples. These are easily recognized as large, scabby or raw bleeding areas in the region of the hocks. If scabs are removed, frequently a white pus beneath can be observed. Usually Staphylococcus germs are found to be complicating or causing the trouble.
**Arthritis.** This condition is usually characterized by lameness (ante-mortem) and swelling around one or more joints. If the joint is opened, a white pus will frequently exude. This also is usually caused by the Staphylococcus bacteria.

**Mastitis.** This is an infection of the mammary glands. It is characterized by abnormally swollen breasts, which may be hot and feverish or hard and cold. When the soft swellings are incised, white pus will usually appear. Again Staphylococcus bacteria are usually found to be the cause of the trouble. All cases of mastitis should be considered very carefully before accepting for food. If accompanied by fever, such animals should never be accepted.

**Note:** Special attention to the above conditions has been made because of the involvement in all of Staphylococcus bacteria. These organisms have been incriminated as the most frequent cause of food poisonings in humans. The germs have the ability, if not properly refrigerated, to produce toxins or poisons which are not destroyed by ordinary cooking, and which could offer a public health hazard.

Also, when any of the above conditions are found, special care should be given to examination of the internal organs, since frequently the infection may enter the bloodstream and produce a condition called pyemia, resulting in abscesses in various internal organs. Only if the infection is local, with no evidence of spread to internal organs, is the meat satisfactory for food. All cases of mastitis or abscesses which affect internal organs should be considered dangerous and unfit for food.

**Favus Infection.** This is contagious skin disease, especially common in young rabbits of fryer age. Parts most commonly affected are nose, around ears, the legs and paws. The lesions vary in size from pinhead to that of a dime. They occur frequently as depressed cups, frequently covered with a yellow to grey colored crust. If the crust is removed, the hairs on the lesion are seen to be broken and split. This infection is a form of ringworm and special caution should be taken by butchers and inspectors to avoid contacting the lesions, since it can cause difficult-to-heal infections in humans. If the animal is in good condition, favus infection should not affect food quality.

**Skin Mange.** This disease is caused by a microscopic mite which burrows into the skin. It produces reddened, scaly skin, with hairless areas. Yellow crusts of dried blood serum may be present. Infected animals usually show intense itching and biting. If condition is so extensive and of long duration, to produce emaciation, animal may not be fit for food.

**Ear Canker.** This condition usually originates from a mite infection (ear mange), which eventually becomes infected. Animals with extreme infections may be emaciated and thin or sometimes the infection may spread to the brain (causing a condition known as wry neck) or a twisted neck. Advanced cases, resulting in emaciation or wry neck, would make the meat unfit for consumption. Mild infections, showing no generalized effect, should not affect meat quality.
Hernias (ruptures.) These are caused by breaks or spreading of muscles, allowing the internal organs to bulge through the openings, being covered only by the skin. Such hernias are most common in the belly region, next to the navel, but may occur in other portions. If they are small, there will probably be no effect on meat quality. However, if large, they can result in emaciation and unfit meat.

Prolapse. This is a condition in which the rectum or female genital organs may be forced out through the anus or vagina, appearing like large masses of raw meat protruding from the vent region. Such animals are not fit for food.

Vent disease (Sometimes called spirochetosis or rabbit syphilis) is characterized by an inflammation of delicate membranes in and about the external genital organs. Yellowish or brownish crusts may cover these parts, with swelling, cracking, and bleeding or pus formation. If the condition does not affect general condition or cause fever, the animal is suitable for meat purpose. If the infection extends to vagina and uterus of the female, or the testicles of the male, the animal may not be suitable for food.

"Scabby Nose". This is an infectious condition, sometimes observed, characterized by scabby lesions around nose and face. As a rule the disease has very little generalized effect on the animal and should not be harmful to quality of meat.

Skin Tumors. Hard tumors of various size are found on the skin or body surface. If small and confined to only one or two tumors which appear local, they should not affect edibility of meat. However, special examination should be made of internal organs to be certain that no malignant tumors of internal organs are present, which would make the carcass unfit for food.

Myxomatosis. This virus infectious disease, although rare, has occurred in California meat rabbits. The early lesions are swelling in the region of the nose, lips and genitals. The ears thicken and usually droop. The eyelids frequently are swollen and inflamed. Frequently pus develops in the nose and eyes. In some forms of the disease, wart-like tumorous growths occur around the face and ears. The internal organs usually show marked enlargement of the spleen and lymph nodes. Infected animals are not fit for food.

Snuffles or Colds. This is sometimes called nasal Pasteurellosis. It is characterized by sneezing, watery eyes, rubbing the nose with the front feet, and frequently mucus discharge from the nostrils. Such animals should be marked and carefully examined postmortem for evidence of pneumonia or generalized Pasteurellosis (septicemia). Carcasses show pneumonia or septicemia are not fit for food.

Bruises, Injuries and Fractured Bones. They may occur as a result of rough handling, or accidents in transit. Animals with fractured bones should not be considered fit for meat. Bruises and hematomas (blood blisters) frequently occur and judgment should be used by inspector as to extent of damage to animal, regarding edibility of meat.
Ejaciation. Animals which are extremely thin, in which the muscles appear abnormal and degenerated, are emaciated. Often the carcass shows a slimy condition of tissue where normally fat is found. Care should be made to distinguish such a degenerative condition from mere leanness, since absence of fat doesn't make an animal unfit for food. Emaciated carcasses are unfit for food.

Diseases of the Respiratory System

Snuffles or Colds. See above.

Pleuritis. This is an inflammation or infection of the sac-like membranes which surround the lungs. Usually this is characterized by thick, white pus completely enveloping the lungs. Sometimes instead of soft pus, a thick, fibrous material is present between the pleura and lungs. Almost always when pleuritis is present, there is also a pneumonia. Carcasses with pleuritis would be considered unfit for food.

Hydrothorax. Occasionally as a result of circulatory disturbance, the chest cavity and lungs will be found to contain large quantities of watery fluid. If this is extensive, the animal would be unfit for food.

Diaphragm. This is the thin sheet-like muscular organ which separates the chest cavity from the abdominal cavity. Occasionally abscesses and tumors may be found here. In rare cases a hernia or rupture may occur, allowing organs from one cavity to fall into the other. Animals with hernias of the diaphragm or large abscesses or tumors of the organ would be usually unfit for food.

Tumors and Abscesses. Tumors or abscesses may be found in any portion of the body. The lungs and sinuses are frequent locations for tumors of various kinds. Animals/carcasses with extensive tumorous growths and/or abscesses of the respiratory organs are unfit for food.

Diseases of the Digestive Tract

Mouth, lips and gullet (esophagus). These organs are subject to various disease conditions which could result in diseased or poor quality meat. Such conditions as faulty teeth, injuries, tumors, abscesses or foreign bodies in these parts will hinder normal intake of food, with consequent malnutrition. Judgment and common sense should be used in determining whether or not such animals should be used for meat.

Stomach. This organ frequently is a source of sickness and poor condition. Impactions with hair or other foreign material, ruptures, tumors and irritations from faulty food are common stomach conditions. Disturbances in normal digestion may result in absorption or toxins or poisons from the intestinal tract into the bloodstream. Therefore, animals with stomach or intestinal disease should be considered carefully before accepting for food. Extreme digestive disorders would render meat unacceptable for food.
**Intestinal coccidiosis.** This infection is caused by an organism in the group known as protozoa. The parasite can only be seen with a microscope. Advanced cases of this disease produce diarrhea, a thin body and pot belly. On postmortem the small intestines and cecum show an unusual appearance. They may be speckled with small pinpoint red spots; they may be grayish-white colored with fine red cross streaks; or they may be dark red. On opening, the internal lining of the intestines often appears dead and mushy. Advanced cases of coccidiosis would render the carcass unsatisfactory for food.

**Mucoid enteritis.** This condition is commonly known as "scours" or "bloat." Affected animals usually stand in a hunched position with ears down and eyes squinted. The coat is rough, with hair erect. Usually the abdomen is bloated and, as a rule, the hind quarters are coated with tarry appearing feces. If the animal is shaken, a gurgling sound usually can be heard in the belly. On postmortem the stomach will frequently contain much water, the cecum, which is the largest part of the intestine, and which is the portion which appears first when opening the abdomen, is often impacted with a hard, clay-like mass of feces. The small intestines usually contain clear, colorless, jelly-like material. Animals with mucoid enteritis are considered unfit for food, since the condition produces toxins (poisons) in the intestines which may be absorbed into other portions of the body.

**Hemorrhagic enteritis.** This type of intestinal disease is characterized by the presence of dark, bloody, liquid material throughout the intestines. Animals with this condition should not be passed for food.

**Peritonitis.** When the peritoneum, which is the membrane covering the abdominal organs, becomes infected or inflamed, the condition is known as peritonitis. This may be localized or it may affect practically all or the organs in the abdomen. It is characterized by formation of pus or fibrous, cheesy masses which frequently result in adhesions among organs. Only animals with very small, local types of peritonitis, which are completely healed, should be accepted for food.

**Other intestinal diseases.** Animals with intestinal impactions, telescoped bowels, twisted bowels, tumors, abscesses or ruptured intestines should not be accepted for food.

**Diseases of the Liver**

The liver, a glandular organ, is usually included as part of the digestive system since bile which the liver produces is so important in helping to digest foods, particularly fats. The organ, however, has many other very vital functions. For this reason when the liver is diseased the entire body is often affected.

**Liver coccidiosis.** This infection is caused by a parasite similar to that which causes intestinal coccidiosis. Liver coccidiosis produces small pinpoint to pea size yellowish-white areas on and throughout the liver. If these are incised with a sharp knife, they will be soft and cheesy in early infections, or firm and fibrous if of long duration. The degree of infection may vary from a few small nodules to so many that the liver tissue may be almost replaced by the diseased material. When only a few small lesions are present, the liver only should be condemned.
The remainder of the animal in such a case usually would not be affected. If the liver is extensively involved the entire animal should be considered unfit for food.

**Bladder worms** (tapeworm cysts). These are the larval stage of dog tapeworms. The parasites produce white channels and streaks, usually on the liver surface. The cysts (bladder worms) are more commonly found in the membranes supporting the intestines (mesentery) and on the outside surface of the intestines. Livers and other internal organs with evidence of this parasite should be discarded. If the infestation is heavy, the entire carcass should be condemned.

**Fatty Degeneration.** Although this condition may affect many organs, in the rabbit it is most frequently seen in the liver. The liver is paler and yellower than normal. It is soft in consistency. The edges are swollen and rounded and the cut surface may be slightly greasy. In advanced cases it becomes hard and fibrous (cirrhosis). Certain infectious diseases and chemical toxins result in abnormal accumulation of fat in the liver cells, producing the condition.

Care must be made to differentiate fatty degeneration from a normal condition known as fatty infiltration. Possibly the best method of differentiating the two conditions is to note the general condition of the animal in relation to the fatty liver.

Fatty degeneration is associated with a disease such as food, drug or bacterial toxicity. It may also be found in a condition known as **ketosis** which is seen only in animals of advanced pregnancy or those which have recently kindled. Since animals in advanced pregnancy or recently kindled animals would not be usually acceptable for meat inspection, this would not be a problem. Animals with fatty degeneration usually do not show excessive fat in the body cavities and frequently other disease conditions can be recognized.

**Fatty infiltration.** Frequently animals which have been fed a high carbohydrate or fat diet will be found to have large quantities of fat accumulated in the body cavities, under the skin, and between the muscles. Associated with this the liver and other organs such as heart and kidneys will frequently have a yellow color. This is known as fatty infiltration which does not render the animal unfit for food. Over-zealous condemnation of such organs may cause considerable difficulty between the inspector and owner of the animals or slaughtering establishment.

**Toxic Liver.** One of the important functions of the liver is to remove poisons (toxins) from the body. When the liver becomes overloaded with such toxins, varying amounts of injury to the liver will occur. It is not always possible to recognize such a condition by the appearance of the liver alone. However, if an animal appears sick on ant-mortem examination with a normal or subnormal temperature - toxic conditions should be kept in mind. In certain toxic conditions the liver will appear normal in size or smaller than normal. Frequently it will appear pale or of a peculiar color. Sometimes it will be hard and rubbery. In some type of poisoning, such as sulfaquinoxal poisoning, the liver and spleen may appear larger than normal with many red, bloody areas. With this type of poisoning there will also be seen hemorrhages in other parts including the skin, muscles, and intestines.
As a result of toxic conditions, such as that resulting from mucoid enteritis, permanent injury to portions or all of the liver may occur, with parts of the tissue dying. These dead portions will usually be replaced by scar tissue if the animal recovers. This is known as cirrhosis. The scars appear as fibrous grayish-white areas or the entire liver may be hard and fibrous. If large portions are involved the liver should be condemned. If the animal appears in good flesh, the remainder of the carcass can be passed for food. However, as a rule, if the majority of the liver is replaced by fibrous tissue, the animal will be thin. The presence of a few minute scars on the liver are of no harm and it is usually judicious to pass them for food. An inexperienced inspector will occasionally become over-zealous in condemning such livers and will mistake them for liver coccidiosis or tapeworm cysts.

**The liver in septicemia.** In bacterial infections in which the germs invade the blood, the condition is called septicemia. In rabbits pasteurella infections are the most common cause of septicemia. Certain virus infections such as myxomatosis also will invade the blood stream. This is known as viremia. In both those types of infection the numerous other organs like an enlarged dark spleen and enlarged red lymph glands throughout the body can be observed. The postmortem effect on the liver of rabbits is similar in both types of infections. As a rule, the liver will appear enlarged, dark or discolored. Sometimes there will be tiny pinpoint grey spots throughout the liver. When cut into, it will be soft and dry or of a mushy consistency. Animals with septicemia should never be passed for food.

**Other liver diseases.** The liver is a common location for tumors of various types. It is also a common location for abscesses. In pyemia (pus germs in the blood stream) the liver may contain many small pinpoint to pea sized abscesses containing white cheesy pus. In any of these conditions the entire carcass would be considered unfit for food.

**Diseases of the Urinary and General Organs**

These two groups of organs (urogenital system) are so closely connected they will be considered together.

**Nephritis.** Any inflammation or infection of the kidneys is classified as nephritis. A vital function of the kidneys is to eliminate waste materials from the body. If this function is hampered the undesirable materials will remain in the body. For this reason, in severe cases of nephritis the quality of meat may be affected.

Many types of nephritis are found in rabbits. The kidney may be small, shrunken and fibrous, particularly in old animals. Sometimes a condition characterized by the presence of small cysts occurs. The kidney is a very common location for pyemic abscesses. Frequently the central hollow portion of the kidney will be found to contain large quantities of pus (pyelonephritis). Occasionally tumors of the kidney will occur.
Cystitis. This is an infection or inflammation of the bladder. Diseases of this organ are relatively rare in rabbits. Occasionally a stone will develop in the urethra (tube leading to the external genitals). In such cases the bladder will be so distended with urine as to occupy the major portion of the abdomen. Such animals are usually affected with uremic poisoning and would be unfit for food.

Colors of urine. A great variation in color and consistency of urine occurs in rabbits. Normal urine will vary from light yellow to amber. Frequently the urine appears thick and milky. The cause of milky urine is unknown but it does appear to be due to a disease.

 Bloody urine is occasionally seen in kidney diseases or certain types of poisoning. It also occurs occasionally with mucoid enteritis. Animals with bloody urine should be carefully examined before passing for food.

Vaginitis. Infection of vagina and uterus occasionally occur in connection with vent disease.

Metritis. This usually refers to an infection or inflammation of the uterus. It frequently occurs as a complication following or accompanying pregnancy. It can usually be recognized by an inflamed appearance of the uterus. When the organ is opened it will be found to contain pus or bloody material. Frequently the remains of an undelivered fetus or unexpelled afterbirth will be present. These conditions render the animal unfit for food.

Dystocia. This condition is the inability of a pregnant doe to have normal delivery of its young. Occasionally a doe which has been unable to deliver its young will be submitted for slaughter. Since most bred does are kept at the rabbitry until after raising young, finding of pregnant animals at slaughter might indicate that it had dystocia. Such animals should be carefully examined ante-mortem and postmortem. Torsions of the uterus, unborn babies crosswise in the neck of the uterus or vagina, ruptured uterus, abdominal pregnancies and the like, would render an animal unfit for food.

Ovaries and Fallopian tubes. Occasionally tumors or abscesses of the organs are found. However, diseases of these organs are relatively rare.

Orchitis. This is an infection or inflammation of the testicles. These organs are quite frequently found to be abscessed. Staphylococci or pasteurella are the usual causes of the complication. Such animals, as is the case in all infections with pus-producing bacteria, should be very carefully considered before passing for food.

Diseases of the Spleen and Lymph Nodes

The spleen in rabbits, in contrast to some other animals is of minor importance in relation to meat inspection. Occasionally in bacterial or virus infections, such as generalized pasteurellosis or myxomatosis, the organ becomes enlarged and swollen. It is a rather frequent location for tumors.
Lymph nodes. These small oval-shaped glandular organs are located throughout the body. They are located under the skin and within the body cavities, usually closely associated with the internal organs. The function of these small glands is to filter out bacteria and other foreign substances which may get into the blood stream. In case of septicemia, these nodes will become enlarged, red and swollen. Such a finding may be a clue to the presence of a generalized infection.

Heart and blood vessels. Disease of these organs is rarely found in rabbits. In cases of pleuritis or pneumonia the heart sac (pericardium) occasionally becomes similarly infected. Occasionally tumor of the heart may occur.

Diseases of the Nervous System

Encephalitis. Infection or inflammation of the brain is called encephalitis. Animals with such conditions are usually detected at ante-mortem inspection. They may show twisted necks, walk in circles, or show paralysis or stupor. Such animals are not fit for food.

Paralysis. The most common cause of paralysis in rabbits is due to injuries of the spinal cord. Paralyzed animals are not usually fit for food.

Other Diseases and Conditions

Yellow Fat. Occasionally an individual rabbit will be found to have fat which is of a deep yellow color. The cause of this condition in rabbits is believed to be hereditary and is not considered harmful from a food standpoint. Possibly from a sale ability standpoint the slaughterer will not wish to use this type of animal.

Tularemia and Bubonic Plague. These two bacterial diseases will be only mentioned here. To date these infections, which are dangerous from a public health standpoint, have been found only in wild rabbits and rodents. Both infections are septicemias caused by different species of pasteurella. If an unusual type of septicemic disease should be detected, veterinary supervisors should be consulted.
After you read this chapter, “Diseases and conditions of rabbits”, please answer the following question:

1. Describe a few common rabbit conditions/diseases observed during postmortem inspection and which require total condemnation?
AVIAN AIR SACS

WHAT THEY ARE, HOW THEY FUNCTION, AND HOW TO FIND THEM

The respiratory system of all modern birds includes, in addition to the lungs, a number of air sacs widely distributed through the body; air cavities in the principal bones, and a complex system of tubes which carry air from the bronchi to almost all parts of the body structure, including the quills of the feathers. This system is unlike that of other vertebrates except for certain reptiles, particularly the lizard Chameleon, which has peculiar lungs with extended sac-like pouches.

The membranes composing the walls of the bird's air sacs and tubes are extremely thin and transparent. They are formed of two layers of tissue: a mucous layer in contact with the air and a serous surface in contact with the body structure and organs.

Air, drawn in from the exterior, flows down the trachea, into the bronchi, through the lungs, and into the air sacs proper. From here, it follows a pathway of small tubes which eventually branch out to the spaces between the internal organs, between the muscles, beneath the skin, between and around the joints of the cervical vertebrae, and into the air cavities of the hollow bones.

There are four distinct pairs of air sacs and a large single sac in fowl starting from the head of the bird. First, the single interclavicular air sac connects the hollow spaces of the wing bones with the anterior, or forward, ends of the lungs. Next, the cervical air sacs, which lie close to the interclavicular sac (and, in the diagram, seem to be part of this sac) connect the cervical and thoracic vertebrae with the lungs. After the cervical sacs, the anterior and posterior thoracic air sacs, two pairs of sacs lying in the chest cavity, connect with the lungs only. Finally, the large abdominal air sacs occupying the spaces between the abdominal organs and the body walls connect the hollow spaces of the leg bones with the lungs.

Because of their extremely delicate nature, the air sacs are usually destroyed in the process of performing a post-mortem examination. However, if care is taken, the posterior thoracic and abdominal air sacs may still be found. Some difficulty is generally experienced by the beginner in differentiating the abdominal air sacs from the also-delicate, thin-walled mesentery membranes. Upon examining the mesentery, one can find large blood vessels running across its surface, whereas air sacs are mostly devoid of circulation.

Since the walls of the air sacs are not supplied, to any great extent, with a capillary network, they are not directly respiratory in function, that is, the exchange of gases which normally takes place in the lungs does not take place in the air sacs.

Air sacs have at least six different functions. They act as bellows, balloons, ballast, and friction pads, heat-retainers, and reservoirs. In the role of bellows, they provide a mechanical aid for efficient circulation of air through the lungs. In birds, the lungs themselves do not expand appreciably, therefore it is the duty of the air sacs to keep a flow of fresh air moving through the lungs.
The air sacs cause the specific gravity of flying birds to be materially lessened. Without the air sacs, the bird would have to exert considerably more muscular effort to keep its body aloft for long periods.

As ballast, the air sacs are so arranged in the body that a proper center of gravity is established in flight, and equilibrium is easily maintained. Air sacs between muscles lessen friction, thereby giving flexibility and grace to the movements of the birds.

When filled with warm, moist air, the sacs help maintain and regulate body temperature by permitting the diffusion of water from the blood to be excreted from the lungs in the form of vapors.

Finally, in flying birds the air sacs act as "reserve tanks" for air. This is especially helpful to fast-flying birds, whose violent muscular action would tend to interfere with breathing and would cause them to "get out of breath," were it not for the air sacs with their reserve air supply.

**Air sacculitis** – inflammation of air sacs.

It is a common condition in the birds. Any bird may suffer from air sacculitis. The air sacs are extremely susceptible to both infection and inflammation due to their anatomy. Infection can be bacterial or fungal. Often developed as a secondary infection leading to fibrinous lesions and presence of exudate inside the sacs. Visible cloudy membranes of the sacs are often the first indication (observe on postmortem inspection) of this condition. Untreated air sacculitis can lead to septicemia/toxemia and then to entire carcass condemnation. In some cases after removing affected parts the carcass can be passed for human food and in others it may not be worth to salvage.

9 CFR 381.84 requires that establishments completely remove and condemn tissues affected with airsacculitis, including exudates, in carcasses not condemned. In addition, 9 CFR 381.84 requires condemnation of the whole carcass if there is evidence of extensive involvement of the air sacs, or if there is systemic change to the carcass. Establishments may have procedures in place to salvage carcasses by ensuring the removal of all affected tissues and exudates in a sanitary manner. Salvaged carcasses are subject to reinspection per 9 CFR 381.76(b)(3)(iii)(c).

More information about carcass judgment with air sacculitis is in Section VIII of this manual.
After you read this chapter, “Avian air sacs”, please answer the following question:

1. What are air sacs, how do they function and how are they located during postmortem inspection?
POST-MORTEM INSPECTION OF POULTRY – ARTICLE 16

a) A careful post-mortem examination and inspection shall be made of the carcasses and parts thereof of all poultry slaughtered at official establishments. The post-mortem inspection shall be made on a bird-by-bird basis on all poultry eviscerated in an official establishment. No viscera or any part thereof shall be removed from any poultry processed in any official establishment, except at the time of post-mortem inspection, unless their identity with the rest of the carcass is maintained in a manner satisfactory to the inspector until such inspection is made. If a carcass is frozen, it shall be thoroughly thawed before being opened for examination by the inspector. Each carcass, or all parts comprising such carcass, shall be examined by the inspector, except for parts that are not needed for inspection purposes and are not intended for human food and are condemned. Such inspection and examination shall be made within 24 hours of the time of slaughter, except when special permission is obtained from the Branch Chief of the Meat, Poultry and Egg Safety Branch.

(b) Conveyors shall be operated at such speeds as will permit a sanitary eviscerating operation and will permit adequate inspection for condition and wholesomeness.

(c) In order to facilitate the work of the inspector and keep the line speed at its optimum, the inspector may be furnished a trimmer or helper.

(d) Each carcass, including all parts thereof, in which there are any lesions of disease, or other condition that might render such carcass or any part thereof unfit for human food, and upon which for that reason a final decision cannot be made by the inspector, shall be retained for further inspection by a qualified inspector. The identity of each such carcass, including all parts thereof, shall be maintained until a final examination has been completed by affixing a “State of California Rejected/Retained tag. These tags shall not be removed except by an inspector.

(e) Such devices, i.e., (racks) and methods as may be approved by the chief of the Meat and Poultry Inspection Branch may be used for the temporary retention of carcasses, parts, or organs in need of reprocessing or further inspections.

(f) Carcasses and parts found to be sound, healthful, wholesome, and fit for human food shall be passed as wholesome and marked as provided in these regulations.

(g) Each carcass to be eviscerated shall be opened so as to expose the organs and the body cavity for proper examination by the inspector and shall be prepared immediately after inspection as ready-to-cook poultry.

(h) In all instances the opening cut must be made in such a way as will permit thorough inspection of the abdominal and thoracic cavities, and will permit the removal of viscera in a sanitary manner.
h) The use of acceptable skin straps suitable for trussing the legs after carcasses have been eviscerated are permitted. A transverse cut through the abdominal wall, commonly known as the “bar cut” is not permitted, except on turkeys, capons, and old hens, providing that such operations are performed in such a manner that contamination of the inner surface of the skin strap does not occur.

i) The giblets shall be separated from the inedible viscera immediately after removal from the body cavity, and shall be immediately cleaned, trimmed, and washed under a continuous flow or spray of water.

j) Confucian exemption may be requested by the clerical official or the responsible leader of the Chinese Benevolent Association.

The **technique of the post-mortem inspection** must conform to the following basic procedure:

(a) **Right Hand Operation.**

1. Grasp one leg, run hand down leg to determine bone disease.

2. Open body cavity to view internal surfaces.

3. Turn body to view outside of bird (including head) for disease, abnormalities and dressing imperfections.

(b) **Left Hand Operation.**

1. Place hand over liver to feel for consistency, texture and lesions, viewing simultaneously.

2. Slip fingers around liver lobe and grasp spleen between thumb and finger, rolling spleen to determine texture and presence of abnormal growth. In case of fryers and broilers it is not necessary to roll the spleen. Simultaneously view other viscera while checking spleen. For those who find it more convenient, the left hand can be used for operations under subsection (a) and the right hand for operations under subsection (b), however; hand motions must be consistent.

The carcasses or parts of carcasses of all poultry inspected at an official establishment and found at the time of post-mortem inspection, or at any subsequent inspection to be affected with any of the diseases or conditions named in other sections of this regulation shall be disposed of according to the section pertaining to the disease or condition.
Owing to the fact that it is impracticable to formulate rules covering every case and to designate at just what stage a process becomes loathsome or a disease noxious, the decision as to the disposal of all carcasses, parts, or organs not specifically covered by these regulations shall be left to the inspector. If the inspector is in doubt concerning the disposition to be made, specimens from such carcasses may be taken by the Department for laboratory analysis and diagnosis.

**Diseases and Conditions Requiring Condemnation of Affected Carcasses.**

(a) Carcasses of poultry affected with or showing lesions of any of the following-named diseases or conditions shall be condemned:

1. Acute ornithosis.
2. Tuberculosis.
3. Erysipelothrix septicemia.
4. Salmonellosis septicemia.
5. Tularemia.
6. Anthrax.
7. Hemorrhage septicemia.
8. Pyemia.
9. Leukemia.
10. Sarcomatosis.
11. Metritis.
13. Emaciation in rabbits.
15. Toxemia.
(b) The lesions of septicemia, viremia and toxemia include cyanosis, hyperemia, anemia, edema, dehydration, hypertrophy, atrophy, and hemorrhagic or necrotic manifestations in any of the body structures. It must be understood that many of these processes may be reactions to local injury and do not alone necessitate condemnation of the carcasses. However, systemic reactions that result in dark dehydrated musculature, doughy skin and flesh, or markedly anemic (pale) musculature shall be condemned, even though other lesions are not apparent at the time of post-mortem examination.

(c) Fowl and rabbits from pathological laboratories shall not be brought onto any official establishment premise.

**Diseases Requiring Condemnation of Carcasses or Parts, Exceptions.**

(a) Carcasses of poultry affected with any of the following diseases shall be condemned, excepting that when recovery has occurred, even though localized lesions persist, or when the lesions are of such character or extent that there is no apparent systemic disturbance, the carcass may be passed for food, after removal and condemnation of affected parts:

(1) Avian monocytosis.
(2) Mycotic infections.
(3) Fowl cholera.
(4) Fowl typhoid.
(5) Pullorum disease.
(6) Infectious coryza.
(7) Pseudotuberculosis.
(8) Infectious laryngotracheitis.
(9) Fowl pox.
(10) Trichomoniasis.
(11) Enterohepatitis.
(12) Coccidiosis.
(13) Newcastle disease.
(14) Infectious bronchitis.

(15) Airsac disease or chronic respiratory disease.

(b) Carcasses of poultry affected with avian leukosis complex shall be condemned.

(c) Any individual organ or part of a carcass affected by a tumor shall be condemned. When there is evidence of metastasis, or that the general condition of the carcass has been affected by the size, position, or nature of the tumor, the whole carcass shall be condemned.

(d) Carcasses of poultry showing any disease such as generalized melanosis, pseudoleukemia, and the like, which affects the system of the animal, shall be condemned.

(e) Any organ or part of a carcass which is badly bruised or which is affected by an abscess, or a suppurating sore, shall be condemned; and when the lesions are of such character or extent as to affect the whole carcass, the whole carcass shall be condemned. Parts of a carcass that show only slight reddening from a bruise, may be passed as wholesome. Parts of carcasses that are contaminated by pus shall be condemned.

(f) Any organ or part of a carcass that is affected by an inflammatory process shall be condemned.

(g) All carcasses of poultry so infected that consumption of the products thereof may give rise to food poisoning shall be condemned. This includes all carcasses showing signs of:

1. Acute inflammation of the lungs, pleura, pericardium or peritoneum.

2. Gangrenous or severe hemorrhagic enteritis or gastritis.

3. Polyarthritis and acute nephritis.

4. Tenovaginitis.

5. Abscess or suppurating sore if associated with general systemic disturbance.

6. Infectious synovitis.

(h) Carcasses showing any degree of icterus with a parenchymatous degeneration of organs, the result of infection or intoxication, and those which, as a result of a pathological condition, show an intense yellow or greenish-yellow discoloration without evidence of infection or intoxication shall be condemned.
(i) Carcasses of poultry (rabbits) affected with mange or scab in advanced stages, or showing emaciation or extension of the inflammation to the flesh shall be condemned. When the diseased condition is slight, the carcass may be passed as wholesome after removal and condemnation of the affected portion.

(j) Edible organs or parts of carcasses of poultry that are found to be infested with parasites, or that show lesions of such infestation shall be condemned.

(k) In the disposal of carcasses and parts of carcasses of rabbits showing evidence of infestation with parasites not transmissible to man, the following general rules shall govern:

1. If the lesions are localized in such a manner and are of such character that the parasites and the lesions caused by them may be radically removed, the nonaffected portion of the carcass, or part of the carcass may be passed as wholesome after removal and condemnation of the affected portions. Where a part of a carcass shows numerous lesions caused by parasites, or the character of the infestation is such that complete extirpation of the parasites and lesions is difficult and uncertainly accomplished, or if the parasitic infestation or invasion renders the organ or part in any way unfit for food, the affected organ or part shall be condemned. Where parasites are found to be distributed in a carcass in such a manner, or to be of such a character that their removal and the removal of the lesions caused by them are impracticable, no part of the carcass shall be passed for food.

2. Carcasses infested with hydatid cysts (Echinococcus granulosus) shall in all cases be condemned regardless of the degree of infestation.

(l) Carcasses of poultry too emaciated or anemic to produce wholesome meat, and carcasses that show a slimy degeneration of the fat or a serous infiltration of the muscles shall be condemned. Mere leanness should not be classed as emaciation.

(m) Carcasses of poultry affected with gout shall be disposed of as follows:

1. The whole carcass shall be condemned if marked deposits of urates are found in the organs or tissues, or if there is evidence of general systemic disturbance.

2. When slight deposits of urates are found in the organs or tissues and there is no apparent systemic disturbance the carcass may be passed as wholesome, after removal and condemnation of the affected parts.

Conditions Affecting Soundness, Requiring Condemnation of Carcasses or Parts.

(a) Carcasses or parts of poultry contaminated by volatile oils, paints, poisons, gases, or other substances that affect the wholesomeness of the carcass shall be condemned.
(b) Any organ or part of a carcass that has been contaminated following mutilation shall be condemned, and if the whole carcass is affected, the whole carcass shall be condemned.

(c) Carcasses of poultry deleteriously affected by post-mortem changes shall be disposed of as follows:

1. Carcasses that have reached a state of putrefaction or stinking fermentation shall be condemned.

2. Any part of a carcass that is “green struck” shall be condemned and if the carcass is so extensively affected that removal of the affected parts is impracticable, the whole carcass shall be condemned.

3. Carcasses affected by types of post-mortem change that are superficial in nature may be passed as wholesome after removal and condemnation of the affected parts.

(d) All poultry that have been suffocated in any way, and poultry that has entered the scalding vat alive, shall be condemned.

(e) Carcasses of poultry showing evidence of having died from causes other than slaughter shall be condemned.

(f) Carcasses of poultry that have been overscalded, resulting in cooked appearance of the flesh, shall be condemned.

(g) All rabbit carcasses to be passed as ready-to-cook shall have the entire skin, feet, head and viscera removed. The kidneys, liver and heart may be left attached to the dressed carcass provided they are thoroughly cleaned.

(h) Any carcass of poultry contaminated during slaughter with digestive tract contents shall not be condemned if promptly reprocessed under the supervision of an inspector and thereafter found not to be adulterated. Contaminated surfaces that are cut shall be removed only by trimming. Contaminated inner surfaces that are not cut may be cleaned by trimming alone, or at an approved reprocessing station away from the main processing line, by any method that will remove the contamination, such as vacuuming, washing, and trimming, singly or in combination. All visible specks of contamination shall be removed, and if the inner surfaces are reprocessed other than by trimming, all surfaces of the carcass shall be treated with chlorinated water containing 20 ppm available chlorine.

(i) An area may be designated as an approved reprocessing station only if the Department determines that reprocessing operations can be conducted in that area in accordance with all of the requirements of this part, and that the reprocessing methods to be utilized are capable of removing all visible specks of contamination on the inner surface of a carcass.
Livers Affected with Abnormal Conditions: Disposal.

(a) Livers showing any of the following pathological processes or abnormal conditions shall be condemned:

(1) Fatty degeneration resulting in visible, well-defined light spots.

(2) Petechial or larger areas of hemorrhages. (The typical paint brushed appearance is not to be considered significant.)

(3) Petechial or larger areas of necrosis.

(4) Inflammatory processes including abscessation.

(5) Neoplastic tissue.

(6) Cirrhosis.

(7) Atrophy.

(8) Cysts.

(9) Discoloration due to chemical toxins, bile duct or gall bladder disorders, and/or post-mortem changes. (Parts of livers showing bile stains should be trimmed off and the affected parts condemned.)

(10) Specific disease lesions such as enterohepatitis, leukemia, etc.

(11) Mutilated livers that have been contaminated with intestinal content in rough or careless handling in the evisceration operation or otherwise contaminated by or with extraneous substances or materials.
After you read this chapter, “Post-mortem inspection of poultry – Article 16”, please answer the following questions:

1. Discuss the steps taken in the postmortem inspection of poultry
2. Name a few diseases that require total condemnation of poultry.
Humane Handling - Article 15

Regardless of the humane method of slaughter employed, the handling of poultry in connection with slaughter shall meet the following criteria.

(a) Poultry shall be delivered to the stunning area in transport cages or other equipment that is of sufficient size to accommodate the size of poultry being presented for slaughter. Cages must be in good repair, free of broken wire, rough areas, holes, sharp projections, and other protrusions to avoid injury to the poultry.

(b) If improper or injurious conditions exist at delivery to the poultry slaughter establishment, the PMI or Branch inspector shall immediately halt slaughter activity until the discrepancy is corrected. A “State of California Rejected/Retained Tag” shall be attached to each cage identified with improper or injurious conditions by the PMI or Branch inspector. The unacceptable conditions shall be corrected immediately by poultry slaughter establishment or its designated representative. The “State of California Rejected/Retained Tag” shall be removed by the PMI or Branch inspector after corrective actions have been taken.

(c) Poultry delivered for slaughter shall be held in a location with adequate ventilation to prevent overheating and shall have protection from exposure to adverse weather conditions.

(d) Poultry shall be stunned, rendered unconscious, or killed before bleeding. Stunned poultry shall remain in a state of surgical anesthesia through completion of the bleeding process.

(e) Bleeding shall be accomplished by severing both carotid arteries or by decapitation. Sufficient bleeding time (approximately 2 to 3 minutes) shall be allowed to prevent the unacceptable condition known as “red skins” which may occur with insufficient bleeding.

(f) PMIs shall be trained in humane methods of handling poultry.

(g) Slaughter and handling of poultry shall be performed by operators in a proper and humane manner.

(h) Each poultry slaughter establishment shall ensure that poultry handlers, slaughterers, and operators have been instructed in the humane methods of handling poultry and operating stunning and slaughter equipment before being assigned to such duties.

(i) Non-commercial stunning or anesthetizing equipment shall not be used.
(a) The Department has determined that the following methods are acceptable and practical humane methods for use in the stunning and slaughter of poultry.

(1) Carbon dioxide, nitrogen, or argon used separately or in combination to produce gas-induced hypercapnea, hypoxia or anoxia.
(2) Electrical stunning.
(3) Electrocution to cardiac arrest.
(4) Captive bolt (ostrich and rabbit only).
(5) Cervical dislocation.
(6) Carotid artery severance.
(7) Decapitation.
(8) Other methods as approved by the Department.

(b) Any of the above methods may be used in combination to effect the most humane slaughter of poultry.

(c) Each poultry slaughter establishment shall be responsible for the selection of safe equipment and the safe use of such equipment.

(d) Establishments selecting gas, electrical stunning, or electrocution method shall install all equipment in accordance with the manufacturer’s specifications, or under the supervision of a licensed engineer. Such installations shall comply with all applicable building and safety codes as specified by local and state government.

(e) Nothing in this section shall be interpreted to contradict provisions of subsections (c) and (d) of this section. Poultry shall be stunned, rendered unconscious, or killed before being bled by simultaneous severance of both carotid arteries or by decapitation.

**Carotid artery severance and decapitation are not approved methods of stunning.**

(a) The stunning area shall be adequately ventilated and the employee exposure monitored in accordance with Title 8, section 5155 of the California Code of Regulations.

**Carbon dioxide** and **argon gas** are heavier than air, and therefore may accumulate in the stunning area.

(b) A record of the calibration and maintenance of all measuring instruments shall be available for inspection by the Department inspector or PMI. All maintenance shall be performed by qualified personnel.

(c) The carbon dioxide, nitrogen, and/or argon gas shall be administered in a chamber or, in the case of ratites, via a properly fitted mask or hood, which accomplishes effective exposure of poultry. Chamber operations shall be in accordance with manufacturer’s specifications and instructions.
(d) Chambers and all auxiliary equipment shall be designed to properly accommodate the species of poultry being stunned or killed.

(e) A uniform carbon dioxide, nitrogen, and/or argon gas concentration and distribution shall be maintained within the chamber to produce effective stunning. The system shall provide for mechanical agitation so that a concentration of carbon dioxide, nitrogen, and/or argon gas is sufficient to accomplish effective stunning and is uniform throughout the chamber. The poultry slaughter establishment shall sample the concentration of gas for analysis from a representative place or places within the chamber on a continuing basis.

(f) Neither carbon dioxide, nitrogen, and/or argon gas nor atmospheric air used in the chambers shall contain irritating gases.

Where electric current is used for the humane slaughter of poultry, it shall be subject to the following requirements.

(a) All equipment shall be installed and used in accordance with the manufacturer's instructions and specifications.

(b) Only electric current application equipment with pathways, compartments, current applicators, and all auxiliary equipment designed to properly accommodate the species of poultry being anesthetized or slaughtered shall be used.

(c) The delivery of poultry to the place of application of electric current shall be done with a minimum of excitement and discomfort to the poultry in accordance with the provisions contained in these regulations.

(d) The application of electric current to stun or induce cardiac arrest shall be performed by operators so as to assure proper handling and humane application.

(e) The electric current shall be administered so as to produce effective surgical anesthesia or death with a minimum of excitement and discomfort.

When electric current is used to stun the poultry, sufficient electric current shall be applied to the poultry during stunning to produce a state of surgical anesthesia or unconsciousness through the completion of bleeding.

Where electrocution to cardiac arrest is used for the humane slaughter of poultry, it shall be subject to the following requirements.

(a) Poultry may be stun-killed with this method.

(b) Sufficient electric current shall be administered to the poultry, depending on size and weight of the species slaughtered, to induce cardiac arrest without the poultry regaining consciousness.
(c) The proper voltage and current setting for each lot of birds may vary due to size and weight variations. Voltage may be adjusted to a higher setting to ensure that each poultry is delivered the appropriate amount of current to induce cardiac arrest.

(d) After each poultry has been electrocuted, it shall be immediately bled by severing both carotid arteries or by decapitation to allow proper bleeding. Adequate bleeding time shall be allowed for each bird. Since electrocuted poultry does not have heart pumping action to facilitate blood loss, more time (approximately 2 to 3 minutes) should be allowed to achieve complete bleeding before being introduced to the scalding tank.

Captive bolt is an acceptable method of humane slaughter of rabbits, ostriches and other similar large birds.

(a) Where captive bolt is used as the humane method of slaughter, the captive bolt device shall be of the appropriate size for the chosen species.

(b) The captive bolt device must be properly placed so that the cerebral hemisphere and the brainstem are adequately disrupted by the penetrating bolt to cause immediate unconsciousness. Immediate bleeding must follow use of the captive bolt device.

Where dislocation of the neck is used as the humane method of slaughter, it shall be subject to the following requirements.

(a) Dislocation of the neck by separating the cervical vertebrae from the base of the skull shall be performed quickly to induce rapid unconsciousness with a minimum of excitement and discomfort to the poultry.
(b) Bleeding shall immediately follow cervical dislocation.

Where carotid artery severance is used for the humane slaughter of poultry, it shall be subject to the following requirements.

(a) Carotid artery severance may be employed by manual or automatic means.

(b) Severing the carotid arteries shall be performed using a sharp instrument which is used to sever both carotid arteries simultaneously.

(c) Regardless of the method employed, it shall be performed quickly to induce rapid unconsciousness or death with a minimum of excitement to the poultry.

Where decapitation is used as the humane method of poultry slaughter, it shall be subject to the following requirements.

(a) Decapitation may be achieved by manual or automatic means.
(b) Decapitation shall be performed using a sharp instrument which achieves the complete severance of the head from the body by cutting all the major vessels of the neck and the spinal cord with a sharp instrument.

(c) Regardless of the method employed, it shall cause quick and complete severance of the carotid arteries and the spinal cord.

(d) All mechanical and automatic instruments used in this method shall be sharp and inspected frequently for sharpness. The poultry slaughter establishment shall ensure that all instruments and equipment are maintained in a satisfactory manner.

Tagging of Equipment, Cages, Pens or Compartments to Prevent Inhumane Slaughter or Handling in Connection With Slaughter.

(a) When a PMI or Department inspector observes an incident of inhumane slaughter or handling in connection with slaughter, they shall notify the poultry slaughter establishment management, or his or her designated representative, of the incident and request immediate corrective action. If the establishment management fails to promptly take corrective action, the inspector shall follow the procedures specified in subsections (b), (c), or (d) of this section, as appropriate.

(b) If the cause of inhumane treatment is the result of facility deficiencies, disrepair, or equipment breakdown, the inspector shall discontinue slaughter operations until the deficiencies have been corrected. The inspector shall attach a tag rejecting the equipment (State of California Rejected/Retained Tag) thereto. No equipment, cage, pen or compartment so tagged shall be used until such equipment is made acceptable to the PMI or Department-inspector. All poultry slaughtered prior to such tagging may be dressed, processed, or prepared under inspection. Upon correcting the deficiency, the establishment may request reinspection of the equipment for release. If corrected deficiencies are satisfactory to the inspector, slaughter operations may be commenced. If release is denied on reinspection, the poultry slaughter establishment may appeal to the Branch Chief, Meat, Poultry and Egg Safety Branch, for resolution of the matter.

(c) If the cause of inhumane treatment is the result of establishment employee actions in the handling or moving of poultry, the PMI or Department inspector shall attach a “State of California Rejected/Retained Tag” to the cage or cages in the stunning or killing area. After tagging, no more poultry shall be stunned or killed until the problem has been corrected. Establishment management shall be informed immediately by the PMI or Department inspector. The tag shall not be removed by anyone other than a PMI or Department inspector. All corrective actions shall be immediate. All poultry slaughtered prior to the tagging may be dressed, processed, or prepared under inspection.

(d) If the cause of inhumane treatment is the result of improper stunning, the PMI or Department inspector shall attach a “State of California Rejected/Retained Tag” to the
stunning area. All slaughter operations shall be discontinued until the appropriate corrective actions have been taken. Upon satisfactory completion of corrective actions, the PMI or Department inspector shall remove the “State of California Rejected/Retained Tag” allowing the plant to resume operations. Management is responsible for ensuring that such infractions do not recur. The tag shall not be removed by anyone other than a PMI or Department inspector. All poultry slaughtered prior to such tagging may be dressed, processed, or prepared under inspection. Upon correcting the deficiency, the establishment may request reinspection of the equipment for release. If release is denied on reinspection, the poultry slaughter establishment may appeal to the Branch Chief, Meat, Poultry and Egg Safety Branch, for resolution of the matter.

(e) Failure to comply with these regulations shall provide grounds for suspension, revocation of the PMI license, or suspension, or revocation of plant license and withdrawal of inspection by the Secretary of the Department of Food and Agriculture or his representative after notice and opportunity for hearing.

Ritualistic (religious) Slaughter.

(a) Where a method of slaughter is prescribed by Kosher or other rules of the Jewish faith, Islamic and other faiths and causes the poultry to lose consciousness through anemia of the brain resulting from the simultaneous severance of both carotid arteries with a sharp instrument, it shall be considered a humane method of slaughter.

(b) Confucian exemption may be requested by the clerical official or the responsible leader of the Chinese Benevolent Association.

(c) Exemptions for other methods of ritualistic slaughter of poultry may be obtained upon approval by the Chief, Meat, Poultry and Egg Safety Branch while effectuating the purpose of these regulations.

(d) The official establishment requesting an exemption shall provide a letter from the clerical official having jurisdiction over the enforcement of religious dietary laws that lists the specific requirements of the Food and Agricultural Code and these regulations from which the exemption is requested and that lists the provision(s) of the religious dietary laws in support of the requested exemptions.

(e) Exemptions may be granted to the extent necessary to avoid conflict with specific religious requirements. Any person processing poultry or poultry products under such exemption shall be subject to all other applicable provisions of the Food and Agricultural Code and these regulations.

(f) The Department may terminate an exemption at any time for failure on the part of the official establishment to comply with the conditions of the exemption, including but not
limited to inhumane handling and slaughter of poultry, unsanitary dressing procedures, unsanitary carcass handling, and failure to maintain the establishment in a clean and sanitary condition.
After you read this chapter, “Humane handling – Article 15”, please answer the following question:

1. Name and discuss humane methods of slaughter and humane handling of poultry in connection with slaughter.
GLOSSARY OF TERMS AND EXPRESSIONS

As used in this subchapter, unless otherwise required by the context, the singular form shall also import the plural and the masculine form shall also import the feminine, and vice versa. For the purpose of these regulations the following words, phrases, names, and terms shall be construed respectively to mean:

**Ante-mortem Inspection.** Examination of live poultry before slaughter to detect conditions that might render the poultry unwholesome.

**Area Supervisor** - means an official employed by the Department in charge of a specified geographical region in California.

**Bar cut** - Regulation Section 1247 (c); a method of making the abdominal cut in which a skin strap is formed (ask instructor to clarify)

**Branch.** The Meat, Poultry and Egg Safety Branch of the California Department of Food and Agriculture.

**Branch Employee.** An employee of the Meat, Poultry and Egg Safety Branch, of the California Department of Food and Agriculture, who is authorized by the Branch Chief to do any work or perform any duty in connection with plant sanitation or poultry meat inspection.

**Breast blister** - Pouch under skin of breast containing watery or diseased material.

**California Condemned** means that the poultry so identified has been inspected by an inspector and found to be in a dying condition, or to be affected with any other condition or disease that would require condemnation of its carcass or its affected parts.

**California Inspected and Passed** means that the poultry product so identified has been inspected by an inspector and passed under the regulations in this subchapter, and at the time it was inspected, passed, and identified, it was found to be not adulterated.

**California Rejected/Retained** means the Red or Green State of California Rejected/Retained tag and used as follows:

(A) When the Rejected box of the Red or Green tag is checked, it indicates that the compartment, room, utensil, or piece of equipment so identified is unacceptable for use in the official establishment and cannot be used until the condition that renders it unacceptable is corrected.
(B) When the Retained box of the Red or Green tag is checked, it indicates that the meat or poultry meat or meat or poultry product so identified is unacceptable for use in the official establishment and cannot be used until the condition is corrected.

(C) Only authorized employees of the Department of Food and Agriculture can release or remove the Red California Rejected/Retained tag; the Green California Rejected/Retained tag may be detached only by a Livestock Inspector, Poultry Meat Inspector, or an authorized employee of the Department of Food and Agriculture.

**California Suspect** means that the poultry so identified by an inspector is suspected of being affected with a disease or condition which may require its condemnation, in whole or in part, when slaughtered, and is subject to further examination by a program employee to determine its disposal.

**Carcass** - New York dressed or ready-to-cook body of poultry.

**Condition** - any state, including, but not being limited to, the state of preservation, cleanliness, or soundness of any product; or any circumstance, including but not limited to, the processing, handling, or packaging that affects such product.

**Crop or cropping** - to remove the feed from the crop of a New York dressed bird; also to remove the crop from a carcass.

**Denature** - to make unfit to eat (such as burning or pouring kerosene, colorful dye on and inside condemned/inedible material.

**Department** - California Department of Food and Agriculture.

**Dressed Poultry** - poultry that has been slaughtered for human food with head, feet, and viscera intact and from which the blood and feathers have been removed.

**Edible Poultry By-products** - any giblets or any edible part of dressed poultry other than eviscerated poultry.

**Free From Protruding Pinfeathers and Hair** - pinfeathers and vestigial feathers (hair or down as the case may be) have been removed so that the carcass is free from protruding pinfeathers and vestigial feathers that are visible to an inspector or Branch employee during an examination of the carcass. However, a carcass may be considered as free from protruding pinfeathers or vestigial feathers if it has a generally clean appearance (especially on the breast) and if not more than an occasional protruding pinfeather is in evidence during a more careful examination of the carcass.
**Giblets** - the liver from which the bile sac has been removed, the heart from which the pericardial sac has been removed and the gizzard from which the lining and contents have been removed: provided, that each such organ has been properly trimmed and washed.

**Hock joint** - joint between drumstick and shank.

**Immediate Container, or True Container** - the unit, can, pot, tin, or other receptacle or covering in which any poultry meat or product is customarily packed or shipped.

**Inspected for Wholesomeness** Under Supervision of the California Department of Food and Agriculture, California Inspected and Passed, or Any Authorized Abbreviation Thereof. That the poultry or poultry meat, poultry meat products, or poultry meat food products so marked have been inspected under these regulations, and that at the time they were inspected and so marked they were free from:
(A) Physical evidence of disease injurious to human health;
(B) Pathological conditions that have rendered or would render the poultry meat unsuited for human food;
(C) Serious destruction of the flesh by disease or injury; or
(D) Contamination by any substance injurious to human health.

**Inspection Mark** - mark or statement, authorized by these regulations, on a product or on the container of a product, indicating that the product has been inspected for wholesomeness by an inspector.

**Inspector** - Department employee employed as a Veterinarian (Meat Inspection), Meat Food Inspector, Supervising Meat Food Inspector, or Chief of the Meat, Poultry and Egg Safety Branch, or an industry-employed and Department-licensed Poultry Meat Inspector.

**Label** - term applies to any display of written, printed, or graphic matter upon any article or any of its containers or wrappers, or accompanying such article.

**Mislabel** - means the placing, or presence of any false, deceptive, or misleading mark, tag, brand, design, inscription, statement, billing, invoice, placard sign, or other descriptive designation.

**Major Reconstruction** - major reconstruction shall be construction other than that associated with normal or routine maintenance activities.

**Misbleed** - (pink) incompletely bled out carcass.
**Potable Water** - water which is free from disease producing organisms and injurious chemicals. It does not possess obnoxious tastes or odors, and is not turbid or colored to a degree that it is rendered repugnant to the consumer. Standards of tests to be used in determining potability shall be the same as the standards of the National Primary Drinking Water Standards, 40 CFR Part 141, sections 141.1, 141.2, 141.3, 141.4, 141.5, 141.6, 141.11, 141.13, 141.21, 141.22 and 141.23 (2007), which are incorporated by reference.

**Non-potable water** – water that is not of drinking water quality.

**Nuisance** - something causing trouble or annoyance, a sanitation hazard.

**Offal** - intestines, feathers, and other inedible parts of a carcass.

**Official Plant or Establishment** - any premises licensed by the Department where poultry is slaughtered or otherwise prepared for food purposes and where state inspection is maintained under these regulations.

**Poultry** - domestic fowl and domesticated rabbit to be used for human food. “Fowl” includes chickens, turkeys, ducks, geese, guineas, squab, quail, pheasant, ratites, and other domesticated birds.

**Poultry Meat Food Product** - any article of food, or any article intended or capable of being used as human food that is derived or prepared, in whole or in substantial and definite part from any portion of poultry.

**Producer** means a person who is engaged in the business of growing any poultry, which is marketed as poultry meat, for a period of three weeks or more for the purpose of increasing the size and weight of such poultry.

**Product** - dressed poultry, ready-to-cook poultry, edible poultry by-product and poultry meat food product.

**Ready-to-Cook Domestic Rabbits** - any domestic rabbit that has been slaughtered for human food, from which the head, blood, skin, feet, and inedible viscera have been removed, that is ready to cook without need of further processing, or any cut-up or disjointed portion of such domestic rabbit.

**Ready-to-Cook Poultry** - any dressed poultry that is free from protruding pinfeathers, vestigial feathers (hair or down as the case may be), and from which the head, shanks, crop, preen gland, trachea, esophagus, entrails, reproductive organs and lungs have been removed, and with or without the giblets, is ready to cook without need of further processing. Ready-to-cook poultry also means any cut-up or disjointed portion of poultry prepared as described in this paragraph.
Regulations or These Regulations - regulations contained in Subchapter 1, Chapter 5, Title 3, of the California Code of Regulations.

Required - demanded by law.

Retained for Further Inspection - means that each carcass, including all parts thereof so marked or identified, is held for further examination by an inspector or Department employee to determine its disposition.

Septicemia - bacteria in the blood; required total condemnation

Shipping Container - the box, bag, barrel, crate, or other receptacle or covering inclosing any product packed in one or more immediate or true containers.

Soundness - freedom from external evidence of any disease or condition that may render a carcass unfit for food.

Thoracic - chest.

Toxemia - toxins in the blood.

Viscera - internal organs.

“Wholesome” - means any poultry meat food product fit for human consumption.

For purposes of section 24713, Food and Agricultural Code, the term “immediate family” means producers, their spouses, children, brothers, sisters and parents. Other relatives of the producers by blood or by law will be considered as qualifying if they reside on the same property as the poultry operation or property that is contiguous to that property.
After you read this chapter, “Glossary of terms”, please get familiar with the terms and learn the meaning of them.
Meeting the Requirements for State Meat Inspection:

Developing Sanitation Standard Operating Procedures (SSOP) - guideline for all three types of operations
Foodborne illnesses are the most important public health problem in the USA. Data from various sources suggest that foodborne microbial pathogens may cause up to 7 million cases of illness each year and 7,000 deaths. Of these, nearly 5 million cases of illness and more than 4,000 deaths may be associated with meat and poultry products.

The Meat, Poultry and Egg Safety Branch is taking steps to improve the safety of meat, meat products and poultry products by implementing the Sanitation Standard Operating Procedures (SSOPs) throughout official state inspected operations.

California Code of Regulations sections 902.9 through 902.14 require poultry slaughter plants to develop, implement and maintain written Standard Operating Procedures for Sanitation (SSOP).

Sanitation Standard Operating Procedures (SSOP) are the sanitation procedures that meat and poultry plants use, both before and during operations, to prevent contamination of products or adulteration.

The next few pages provide general guidelines on how to create plant Sanitation Standard Operating Procedures (SSOPs) that meet regulatory requirements and reflect plant operations. This guideline doesn’t fit any particular plant that is currently under inspection. The management in each plant is responsible for creating and implementing a SSOP plan that is adequate for plant operations and successfully prevents contamination of product or product adulteration.
FIVE SSOPs REQUIREMENTS

The MPES Branch expects plants to monitor their preventive procedures and act appropriately if direct product contamination occurs. The Branch field inspector, after reviewing thoroughly each SSOP plan, will decide on its effectiveness to prevent and react to direct product contamination. During the SSOP verification process, the inspector makes sure that the SSOP fully reflects plant operations, plant setup and addresses the plant’s most common sanitation difficulties.

1. The first requirement is that the plant has a written SSOPs plan that describes daily sanitary procedures the establishment will conduct before and during operations and the frequency at which they will be conducted to prevent direct contamination or adulteration of product(s).

Specificity and detail on how the plant wants to accomplish this component is up to the plant. The emphasis of this requirement is the prevention of direct contamination or adulteration of product. Plants should develop procedures that can realistically be carried out given their size, management and empowerment philosophy, and nature of operations. The goal is to prevent direct product contamination and have procedures to immediately react to occurrences of direct product contamination.

A. Preoperational procedures (cleaning & sanitizing before operations)

This part must identify and describe all cleaning and sanitizing procedures performed on a regular basis to prepare processing areas for the next operational period. In other words, it is a clearly written description of the plant’s main cleaning and sanitizing process. In most plants cleaning takes place at the end of operations but they can also be conducted just before operations start. Different parts of the plant should be cleaned on various cleaning schedules, including daily, weekly, monthly etc. to prevent product contamination or adulteration. Outside premises, as part of the plant, should be kept reasonably free from any organic or hazardous material.

Different cleaning equipment (brushes, pads, buckets etc) should be used in different parts of the plant to prevent cross contamination.

Examples of pre-operational procedures:

- Cleaning and sanitizing tables, cutting boards, containers, trays, hooks, and other plant equipment before using them
- Cleaning and sanitizing walls, scabbards, aprons, and other tools etc.
- Cleaning restrooms, lunchroom, lockers etc.
B. Operational procedures (sanitation activities during operations)

The document must describe procedures that are performed during operations on a daily basis to prevent product contamination or adulteration.

Examples of operational procedures:

- Employees will wash their hands during production as necessary to prevent product contamination
- Pest (flies/rodent) control will be in place each day
- Aprons, helmets are not to be taken outside
- Washing & sanitizing hands after using bathroom, checking personal hygiene etc.
- Regular training about sanitary behavior during work hours
- Cleaning and sanitizing all use equipment every 5 hours of operation when working not under refrigerating temperature

2. The second requirement is that the written SSOPs plan be signed and dated by an official with overall on-site authority or a higher level official of the establishment. The SSOPs plan must be signed upon initiation and when modified.

The individual with overall authority on-site or a higher level official of the establishment must sign and date the SSOP (a) when they first begin using it and (b) anytime changes are made to it. Many facilities use signature log pages to meet this requirement.

3. The third requirement is that the SSOP plan identifies pre-operational sanitation procedures and distinguishes them from sanitation activities to be carried out during operations. These pre-operational procedures at a minimum must address the cleaning of food contact surfaces of facilities, equipment, and utensils.

This third requirement of SSOP may raise many questions by industry as to how specific in detail they are to get. Plants may, but are not required to, go into great detail in listing each specific piece of equipment for cleaning and monitoring in the written SSOP. However, all plant equipment used in poultry processing must be cleaned and sanitized.

Plants are expected to utilize chemicals, cleaning compounds and other tools strictly in the way recommended by product manufactures.
Methods used by a plant to monitor and maintain pre-operational sanitation procedures, and the frequency for doing so, may be met under this requirement or under requirement one. Effectiveness of pre-operational sanitation procedures will be determined through the verification/inspection process, NOT the evaluation process.

4. The fourth requirement is that the written SSOP identify individual(s) who are responsible for implementing and maintaining daily sanitation activities. Plants should identify these individual(s) by name or job title.

The written document must identify WHO is responsible for making sure that these procedures are performed as stated in the document. This may be one or more than one person or position.

**Example**: Bo Green, the owner of Bo’s Sausage, is responsible for insuring the SSOP’s are implemented as stated.

Effectiveness of responsible employee(s) in implementing and maintaining daily sanitation activities will be determined through the verification process, NOT through the evaluation function.

5. The fifth and last requirement is that establishments maintain daily records that demonstrate they are carrying out the sanitation procedures outlined in their SSOP plan, including the corrective actions taken.

Plant management has flexibility in designing such records. There is no set format required, only that a record is maintained. Records may be maintained on a computer in lieu of hard copy as long as they are accessible to inspection personnel.

**SSOP Corrective Actions**

Because no system is perfect, sanitation problems can occur. If a problem occurs, product may become contaminated or adulterated. Any time product has been contaminated or adulterated or direct product contact surfaces are unclean, the establishment must take appropriate corrective actions and document them!

**These actions must include:**

1. Ensuring the appropriate handling of affected product (if necessary)
   a. If product has been contaminated, it may need to be disposed of. In some situations, it may be reprocessed.
b. In some cases, product has not been affected. For instance, if a monitor checks a piece of equipment for cleanliness before it is used for processing, and finds a dirty spot, no product has been affected as the equipment had not been used yet.

2. Restoring sanitary conditions

a. The operation must take any measures necessary to correct the problem.

3. Preventing recurrence

a. The operation must identify actions they will take to prevent it from happening in the future.

There are many ways to document corrective actions; however, any documentation needs to include the three items identified above. A written corrective action might look like this:

<table>
<thead>
<tr>
<th>Date</th>
<th>Problem Identified</th>
<th>Handling of product</th>
<th>How sanitary conditions have been restored</th>
<th>Preventive measures</th>
<th>Initials of employee responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/15/05</td>
<td>Rust on the saw blade during preoperational monitoring</td>
<td>No product affected, equipment not in use yet</td>
<td>The rusty saw blade was removed and replaced with a new one</td>
<td>Blades will be inspected for rust and changed on a regular basis.</td>
<td>BG</td>
</tr>
</tbody>
</table>

**Implementing and Monitoring the written SSOP**

The establishment is responsible for developing written procedures that are adequate to prevent direct contamination of product during their operation. Each establishment must perform these procedures as written. Monitoring of these procedures is also required to ensure that the procedures are adequate and performed as written. If the establishment writes a procedure in its SSOP, it must implement that procedure and **monitor it at least daily**. They must document their monitoring procedures as a means of providing evidence that the procedures were adequate and performed as written.
**In short, the establishment must say what they are going to do, do what they say and then monitor and document it.**

There are many acceptable forms of documenting the monitoring procedures. All records must be initialed and dated daily by the employee(s) responsible for implementing and monitoring the SSOP. Each facility should use a form of documentation that accurately represents the monitoring procedures they use in their operation.

**Evaluating the Effectiveness of the SSOP**

To meet the regulatory requirements, the establishment must routinely evaluate the effectiveness of the SSOP in preventing direct contamination of product. This means that the establishment must review their procedures on a regular basis to be certain that they are effective. The establishment should also routinely review their SSOP monitoring records to determine if they need revising. If monitoring records indicate certain pieces of equipment are found to be dirty frequently or certain personnel are not following procedures correctly, the procedures in the SSOP may need to be changed to address these issues and/or employee(s) need to be retrained. Also, if changes are made in the facilities, equipment, utensils, operations, or personnel, the SSOP must be revised to keep it effective. Remember, the SSOP must be signed and dated when any modification is made.

**Records Retention**

The daily SSOP records and corrective actions must be kept on-site for 48 hours and must be maintained for at least 6 months. After the initial 48 hours, records may be kept off-site provided that they can be retrieved for inspection personnel within 24 hours of the request.
HOW TO MAKE YOUR OWN SSOP

General considerations

Plant sanitation is a plant responsibility and it must fully address facility setup, operational/processing equipment, and plant employees. These practices or procedures must be documented to validate that meat or meat product safety was maintained during time of production or processing. For the internal needs of an operation, documentation is the most efficient and accurate way to confirm that employee duties regarding sanitation have been performed. Documentation is also vital for external regulatory credibility, as written proof for regulatory agencies or inspectors of the plant’s cleaning and sanitation procedures.

SSOP should be specific to each facility where poultry or poultry products are produced or processed. Various cleaning schedules, including daily, weekly, monthly and annual duties, should be integrated to provide a well rounded sanitation plan.

Good sanitation helps ensure that meat contact surfaces remain free of previously processed products and other contaminants.

Regulations require that plant rooms, compartments, equipment, and utensils used for processing or handling meat or poultry be kept clean and in sanitary condition (cleaning and sanitizing on a regular schedule). Cleaning is removing the dust, debris or other visible contaminants from a surface. Once the surface is clean, it should be sanitized to remove the potential for microbial contamination. Sanitizing is not effective without cleaning the surface first.

Operations with poor sanitation in the meat food environment can significantly increase the risk of contaminating final product. Pathogenic microorganisms may be found more often there, on the equipment in use, on the hands of employees, on the floors or in any other places in the plant.

Sanitation procedures and evaluation

Plant must identify individual(s) who have responsibility for implementing and maintaining daily sanitation activities.

Sanitation procedures must be documented, describing chemicals used, cleaning procedure for various equipment, plant utensils, rooms, etc.
Contact time required for cleaning compounds and sanitizers must be stated clearly. SSOP’s effectiveness should be evaluate periodically by plant management and findings should be documented.

Cleaning equipment and machinery

All pieces of equipment in contact with poultry or poultry product may serve as a vehicle for spreading microbial contamination. Therefore, they must be cleaned and sanitized before being used. Equipment brought from storage or equipment that has not been used should be cleaned and sanitized immediately before use. Equipment and tools used for cleaning should be dedicated exclusively for life poultry section or poultry processed areas, and be easily distinguishable (one method being color coding).

Remember to clean and sanitize all cleaning equipment after using it.

Gloves, aprons, etc., must not be removed/taken from the area of use. In no case should they be carried or worn to the restroom, break room, designated smoking areas or outside of the processing area. Sanitizing foot/hand dips can be used prior to entry into a production area. Equipment such as tools, boots, gloves, smocks, and aprons should be cleaned and inspected for defects on a regular basis, and replaced as needed.

Sanitize processing equipment frequently

All poultry processing equipment should be cleaned and sanitized with an effective bactericide at regular and documented intervals. They should be cleaned, sanitized, and check prior to daily start up. Sanitizing should occur only after the area has been cleaned. There should be documentation that the sanitizing solution is effective against most pathogenic organisms such as Salmonella, E. coli and so forth.

Clean product storage areas regularly.

Remove, as much as practical, all visible debris, soil, dirt, and unnecessary items from product storage areas on an ongoing basis. Clean these areas on a regularly scheduled and “as needed” basis and take steps to minimize free-floating dust and other airborne contaminants.
Comply with your own SSOPs

A Sanitation SOP identifies and describes all procedures that plant will conduct daily and identifies frequency with which each procedure is to be conducted. Sanitation SOP identifies also plant employee(s) responsible for the implementing and recording those procedure(s).

All procedures in the Sanitation SOP should be conducted at the frequency specified. Implementation of procedures are monitored and recorded. Plant employees should evaluate the effectiveness of the Sanitation SOP and revise as necessary. Plant employees should be checking their own compliance with their own rules.

Corrective Actions

A Corrective action is an action taken by the plant employee(s) when either the plant or Branch Inspector determines the Sanitation SOP or procedures therein may have failed to prevent direct contamination or adulteration of product(s).

Corrective actions include the procedures to ensure appropriate disposition of product(s) that may be contaminated, restoration of sanitary conditions, prevention of the recurrence of direct contamination or adulteration of product(s).

Corrective actions should be monitored, recorded, dated and authenticated by responsible plant employee’s initials.
# PRE-OPERATIONAL SANITATION SSOP
## Form # 1

<table>
<thead>
<tr>
<th>Establishment Name</th>
<th>Establishment Number</th>
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</thead>
<tbody>
<tr>
<td></td>
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<table>
<thead>
<tr>
<th>Management Signature</th>
<th>PMI Signature</th>
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<tbody>
<tr>
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Fill in spaces across from the items using the appropriate symbol:
(A) Acceptable    (U) Unacceptable

| Day of the Month | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
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| Processing Areas |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

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Initials of person performing Inspection
# OPERATIONAL SANITATION SSOP

## Form #2

<table>
<thead>
<tr>
<th>Establishment Name</th>
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<tr>
<th>Management Signature</th>
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Fill in spaces across from the items using the appropriate symbol:
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Initials of person performing Inspection
<table>
<thead>
<tr>
<th>Date</th>
<th>Problem Identified</th>
<th>Handling of Product</th>
<th>How sanitary conditions have been restored</th>
<th>Preventative Measures</th>
<th>Initials</th>
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## NON-DIRECT CONTACT SURFACES SANITATION SSOP

### Form #4

| Processing Areas | Day of the Month | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|-----------------|------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1.              |                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 2.              |                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 3.              |                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 4.              |                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 5.              |                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 6.              |                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 7.              |                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 8.              |                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 9.              |                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 10.             |                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

Initials of person performing Inspection

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Fill in spaces across from the items using the appropriate symbol:

(A) Acceptable  (U) Unacceptable

---

Establishment Name

Management Signature

Establishment Number

PMI Signature

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Initials of person performing Inspection
SANITATION STANDARD OPERATING PROCEDURES
SSOP Form # 5

Est. #_________ Name______________________

Approved Chemicals list

1. Cleaning agents

<table>
<thead>
<tr>
<th>Name</th>
<th>Manufacture</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td></td>
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<tr>
<td>c.</td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td></td>
</tr>
<tr>
<td>e.</td>
<td></td>
</tr>
</tbody>
</table>

2. Sanitizing agents

| a. |             |
| b. |             |
| c. |             |
| d. |             |
OBJECTIVES OF BASIC CHICKEN ANATOMY AND PHYSIOLOGY TRAINING

Through assigned reading, demonstrations and hand on practice you should gain the knowledge necessary to meet these objectives. When you complete this phase of training, you must be able to identify first on drawings and then on actual bird and/or carcass selected for this purpose, the various major anatomical structures as presented in reading assignments and demonstrations. You must also gain the basic knowledge of poultry physiology to understand functions of most poultry internal organs.

What is different about the bird compared to mammals?

Feathers - Lack of teeth - Lay eggs - Float and fly - Waste excreted from only opening

Anatomical Terms

The following terms are used to describe locations on the animal body;

Dorsal: pertains to the upper surface of the animal.

Ventral: relates to the lower and abdominal surface

Cranial: (or anterior): applies to the front or head.

Caudal: (or posterior): pertains to the tail or rear.

Body Systems of Poultry

Integumentary - Respiratory - Skeletal - Digestive - Circulatory - Urinary - Reproductive

Integumentary System

The skin, feathers, and beak.

Function: to protect the bird from external harm.

Skin - much like humans, with the exception of plumage production.

Plumage: the outer covering of a bird’s body feathers, scales, filoplumes.

Filoplumes: hair-like structures located at the base of feathers.
Wattle: a red growth underneath the beak, which works in conjunction with the comb, an excess of skin on top of their head.

Function: circulation of blood between the two regulate the temperature of the bird. The size of the comb is an indication of the levels of testosterone in the body. If the comb is large, then this means more testosterone is present, often meaning the sex of the bird is male.

The plumage is always for altered shape.

Function: body cooling and heating for maintenance of body temperature, protects against abrasions and bruises when birds are in groups or lying on the ground. Plumage shape is particularly important for cooling since birds lack sweat glands. Although it is not common for production birds to fly, plumage type and form is an important determinant in flight for aerial species.

Respiratory System

Vastly different than the mammalian respiratory system. Unlike mammals, birds lack a diaphragm to inflate and deflate the lungs. Instead, birds have nine air sacs located in the neck region and body cavity that function to inflate the lungs. Gas exchange occurs in the avian lung and the air sacs function to move air in and out of the respiratory system.

Skeletal System

1. Pneumatic Bones
Poultry have pneumatic, or hollow, bones. Connect with the respiratory system. Their light weight is an adaptation for flight.

2. Medullary Bone
Medullary bone contains high amounts of calcium. Storage source is used by the female hen to produce the egg shell during reproductive periods.

3. Fused Bones
Bones in the foot, or shank, are fused. Cause birds to walk upright. Many vertebrate along the backbone are fused for the purpose of flight.
This should include, but not be limited to the following bird parts and organs:

<table>
<thead>
<tr>
<th>Bird Part</th>
<th>Bird Part</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hock Joint</td>
<td>Crop</td>
</tr>
<tr>
<td>Keel</td>
<td>Ovary and/or Testicle</td>
</tr>
<tr>
<td>Esophagus</td>
<td>Bursa Fabricius</td>
</tr>
<tr>
<td>Windpipe</td>
<td>Drumstick</td>
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<tr>
<td>Lung</td>
<td>Thigh</td>
</tr>
<tr>
<td>Heart</td>
<td>Tibia</td>
</tr>
<tr>
<td>Proventriculus</td>
<td>Humerus</td>
</tr>
<tr>
<td>Gizzard</td>
<td>Sternal ribs</td>
</tr>
<tr>
<td>Liver</td>
<td>Vertebral ribs</td>
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<tr>
<td>Spleen</td>
<td>Wattles</td>
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<tr>
<td>Kidney</td>
<td>Comb</td>
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<tr>
<td>Cecum</td>
<td>Vent</td>
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</tbody>
</table>
Anatomy and Physiology of Poultry
Anatomical Directional Terms
MEAT, POULTRY and EGG SAFETY BRANCH
POULTRY MEAT INSPECTORS TRAINING MANUAL

Tongue
Pharynx
Esophagus
Inguinies (crop)
Craniodorsal diverticulum
Ventriculus (gizzard)
Caudoventral diverticulum
Duodenal loop
Pancreas
Pancreatic ducts
Proventriculus
Bile ducts
Small intestine
Jejunum
Ileum
Ceca
Colon (rectum)
Opening for ureter
Opening for oviduct or ductus deferens
Closure
Exterior Carcass

- Comb
- Beak
- Wattle
- Sternum
- Oil gland
- Shank
- Wing tip
- Hock joint
POULTRY ANATOMY

Skeletal System

- CERVICAL VERTEBRA
- HUMERUS
- VERTEERAL RIBS
- RACOID
- WISHBONE [CLAVICLE]
- THIGH BONE
- PYGOSTYLE
- SACRAL BONE
- ULNA
- RADIUS
- Tibia (Drum Stick)
- HOCK JOINT
Esophagus

Crop – moisten and temporary storage of food
Proventriculus – stomach of the bird – uses acids and enzymes to breakdown food

Gizzard – like “teeth”, it mechanically grinds up food particles
Small Intestines - function: absorption of nutrients from food
Three sections:
- Duodenum
- Ileum
- Jejunum

Ceca - Two ceca that are terminal pouches. Function: fermentation of any left over food particles/ water absorption.
Colon - Large intestine - Function: Further water absorption

Cloaca - Also known as the vestibule. Function: responsible for expulsion of feces and urine through the vent.
Liver - multi-lobed organ

Functions:
- produce bile to digest fats (stored in gall bladder).
- detoxification
- store fat and fat-soluble vitamins (i.e., A, D, E, K)
- metabolize fats, carbohydrates, and proteins that are in the diet.

Heart - pumps blood throughout the body to deliver oxygen and nutrients to tissues and to remove carbon dioxide and metabolic waste from tissues.

Blood Vessels
Arteries: carries blood from heart & to the rest of the body.
Arterioles: directs blood to certain tissues of the body.
Capillaries: site of exchange between blood and tissues.
Veins: brings oxygenated blood back to the heart
Urinary System

Kidneys
Two multi-lobular structures located in the rib cage. Produce urine by removing waste products from the blood.

Ureters
Transports the liquids kidney filtrate from the kidneys to the cloaca for excretion. Birds do not have a bladder. Urine is not stored, but rather excreted when produced.

Cloaca
Feces and urine exit out of the bird’s body through this region in the abdominal cavity.

Uric Acid Excretion
Poultry excreta contain uric acid. Very high in nitrogen due to its lowered water content is semi-solid.

Male Reproductive System
1. Two testes located internally in the body.
2. Ductus Deferens that deliver semen from the testes to the phallus.
3. Rudimentary phallus - poultry have no external penis, but rather an internal protuberance termed a rudimentary phallus.

Female Reproductive System
1. Ovary - poultry have only one functioning ovary, usually the left ovary.
2. Oviduct
   a. Function: to produce albumen (egg white), shell membrane, and the shell around the yolk.
      b. Five regions
         1. Infundibulum: receives the follicle and is the location of conception where the male and female gamete come together.
         2. Magnum: produces the albumen.
         3. Isthmus: produces the inner and outer shell membranes.
         4. Uterus: plumps the egg, forms the shell and cuticle (seals pores of the egg shell) and determines the shell pigment.
         5. Vagina: produces some cuticle, and expels the egg and regulates timing of egg production.
3. Cloaca - Also known as the vestibule. The common chamber through which the egg passes is also responsible for the expulsion of feces and urine.
4. Vent - the exterior opening through which passage occurs from the digestive system, the urinary tract and the reproductive tract.
5. Ovulation - The releasing of the egg yolk from the ovary to begin its journey through the oviduct.
6. Oviposition - the process of laying the fully formed egg which is regulated by hormones.
POULTRY ANATOMY

Digestive System

ESOPHAGUS

PROVENTRICULUS
(TURE STOMACH)

VENTRICULUS
(GIZZARD)

PANCREAS

RECTUM

CLOACA

CECA (BLIND GUT)

LARGE INTESTINE

GALL BLADDER

LIVER

SMALL INTESTINE

CROP (CRAW)
RESPIRATORY/REPRODUCTIVE SYSTEM

NOSTRI

TURBINATED BONES

ASAL CAVITY

S INUS (INFRA ORBITAL)

CLEFT IN PALATE

GLOTTIS

(OPENING ON LARYNX)

LOWER (INFERIOR) LARYNX

UNG

THROAT

WINDPIPE

BRONCHIAL TUBES

DIAGRAMMATIC DRAWING SHOWING LOCATION OF AIR SACS IN FOWL

Female REPRODUCTIVE SYSTEM

OVARY

SECRETIN PORTION

SHELL MEMBRANE

SHELL SECRETING TUBES TO KIDNEYS

FUNNEL

CLOACA

VENT

VAGINA
After you read this chapter, “Sanitation Standard Operating Procedures (SSOP) and Basic poultry anatomy and physiology”, please answer the following questions:
1. Describe the five requirements of a plant SSOP.
2. Who is responsible for creating, implementing and monitoring a SSOP?
3. How is the effectiveness of the SSOP evaluated?
4. Name and describe a few main internal organs of chicken.