TABLE OF RESPONSIBILITIES

<table>
<thead>
<tr>
<th>Activity</th>
<th>Name</th>
<th>Position</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation</td>
<td>Jorge Milton Amado, M.V. M.Sc.</td>
<td>Official inspector of beef products and slaughterhouses</td>
<td></td>
</tr>
<tr>
<td>Review</td>
<td>Nelson Ruano, M.V. M.Sc.</td>
<td>Chief of the animal and hydro biological product department</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Otto Maldonado, M.V.</td>
<td>Head of the traceability department</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Antonio Ferraté, M.V. M.Sc.</td>
<td>Director of Safety</td>
<td></td>
</tr>
</tbody>
</table>

Date of entry into force: December 2011
INTRODUCTION
The Ministry of Agriculture, Livestock and Food –MAGA – that is responsible for overseeing animal food safety assurance, produces the Manual of health hygiene requirements for the construction of a slaughterhouse to slaughter and dress bovine cattle.

OBJECTIVES:
1. To draft a document that describes health hygiene requirements for the design, construction and equipment to slaughter and dress animals of the bovine species.
2. Sanitation and hygiene construction requirements set forth in this manual help prevent, minimize or eliminate beef product contamination risks in every production activity.

SCOPE
To define the sanitation and hygiene requirements required when designing, building and equipment for a cattle slaughterhouse.

DEFINITIONS
1. Adequate Means that which is needed to have good public health practices in place.
2. Competent authority The official authority designated by the government to control beef hygiene including formulation and compliance with regulatory standards for beef hygiene.
3. Suitable for human consumption means that it is suitable for human consumption pursuant to the following criteria:
   • It is adequate for its intended use, and
   • It meets results-based parameters regarding diseases or defects as determined by competent authority.
4. Carcass is the body of a cow after dressing.
5. **Beef** All the parts of cattle that have been rated safe and suitable for human consumption or which are intended for this purpose.

6. **Raw meat** Fresh beef, chopped or mechanically separated.

7. **Fresh meat** which, apart from refrigeration, has not been subject to treatment other than protective packing, and which preserves its natural characteristics.

8. **Impounded** Which has been inspected and an opinion issued by a competent person or about which competent authority has otherwise determined that it is hazardous or not suitable for human consumption and must be properly destroyed.

9. **To disinfect** means that surfaces that come into contact with food are properly treated with an effective process to destroy vegetative microorganism cells that are important to public health and substantially reduce the number of other undesirable microorganisms without adversely affecting the product or its safety for consumers.

10. **Must** A compulsory requirement that is included in legal regulations, national standards, and international standards.

11. **Must** A recommendation based on inspection criteria.

12. **Disease or defect** Every irregularity which affects safety and/or health.

13. **Dressing** Progressive separation of the body of cattle from its carcass and other edible and inedible parts.

14. **Safety**: Assurance that food will not harm consumers when prepared and eaten according to their intended use.

15. **Non-operation facilities** means facilities built for plant administration and management.

16. **Ante-mortem inspection** Every procedure or test done by a competent person in live animals in order to issue an opinion on their safety, health and intended use.

17. **Organoleptic inspection** The use of sight, tact, taste and smell to identify diseases and defects.

18. **Post-mortem inspection** Every procedure or analysis conducted by a competent person on all the relevant parts of slaughtered cattle with the purpose of issuing an opinion on its safety and hygiene and intended use.

19. **Lot** Means food produced during a period of time, identified through a specific code.

20. **MAGA**: Ministry of Agriculture, Livestock and Food
21. **Slaughterhouse** Every facility where cattle is slaughtered and prepared for human consumption that has the approval, registry and/or has been put in a list by the competent authority for said purpose.

22. **Inedible** That has been the object of inspection and opinion by a competent person or about which a competent authority has somehow determined that it is not suitable for human consumption.

23. **Quality control operations** means a planned and systematic procedure to take all necessary precautions to prevent food adulteration.

24. **Competent body** is an officially recognized body that is supervised by competent authority to carry out specific activities related to meat hygiene.

25. **Competent person** A person that has the training, knowledge, skills and capacity to perform his/her tasks and is subject to requirements established by competent authority.

26. **Plant** Means the building or facilities used for or in relation with the manufacture, packing, or storage of food for human beings.

27. **Pest** Is an undesirable mammal or insect including, but not limited to birds, rodents, flies and larvae.

28. **Reprocess** Means to clean unadulterated food that has been withdrawn from the process for reasons different to unsanitary conditions or which have been adapted in such a way that they are rendered adequate to use as food.

29. **Surfaces that come into contact with food** Surfaces that come into contact with food for humans and occurs regularly during the normal course of operations. Surfaces that come into contact with food include utensils, gloves and equipment surfaces that come into direct contact with food.

30. **Verification** Activities carried out by competent authority and/or competent agency to ensure compliance with regulatory provisions.

31. **Production area**: Processing area/s from receipt to packing.

32. **Product area**: The area where exposed raw materials, unpacked finished food products, processing equipment, equipment surfaces that go into contact with foods are located.

33. **Red entrails**: include the heart, lungs, liver, spleen and kidneys.
34. **Green entrails**: Include el rumen, reticulum, omasum, abomasum, small intestine and large intestine.

35. Vice Ministry for Agricultural Health and Regulations.

## I. GENERAL CONSIDERATIONS

While the basic principles regarding beef slaughterhouses have not changed over time, major improvements have been made in recent years with regard to construction techniques, mechanization, slaughtering methods, by-product processing and industrialization, which are the logical outcome of the increasing demands posed by the industry’s economic factors, as well as the sanitation and health rules adopted by modern society.

Basic sanitation principles require that slaughtering and processing livestock intended for human consumption be carried out in establishments built specifically for that purpose and kept under constant supervision to ensure cleanliness.

Construction of regional industrial slaughterhouses that supply the largest possible number of towns must be promoted. This would reduce operation costs and promote the use of by-products for industrial use.

Ongoing improvements in meat cooling and freezing techniques, as well as the growing use of refrigerated transportation make these regional slaughterhouses even more feasible. Currently these are built directly in livestock production areas.

The design and construction of a slaughterhouse is basically a functional issue. At first sight this might seem simple but is actually rather complex. Design varies from country to country, and even from city to city, depending on livelihoods and custom. A basic principle to consider is that each slaughterhouse must provide the largest amount of services at the lowest cost possible.

To develop this topic we must address, in summary, the advantages that slaughterhouses offer:

a. Cattle welfare

b. Humane and uniform slaughtering
c. Aerial dressing system
d. Staff skills to slaughter and dress cattle
e. Perfect skill by staff in charge of dazing
f. Calibration and proper maintenance of dazing equipment
g. Humane and uniform dazing
h. Full bleeding
i. Mechanical hide separation
j. Mechanical breastbone cutting
k. Immediate evisceration
l. Perfect meat sanitary control
m. Perfect red and green entrail washing
n. Perfect use of by-products
o. Celerity to conduct operations
p. Perfect staff sanitary control
q. Better utilization of the land
r. Intake collection
s. Blood collection
t. Adequate management of the solid and liquid waste resulting from slaughtering, dressing and deboning activities, as applicable.
u. Staff welfare (restrooms, toilets, locker rooms and dining room).

II. SLAUGHTERHOUSE ORGANIZATION

Slaughterhouse organization is dependent on its capacity and type of slaughtering done, which indicate the number and size of services needed for proper operation.

Some slaughterhouses slaughter 5 to 10 steer per day while others have 60-animal capacity per hour. Capacity variation is so huge that evidently presenting a detail of sanitary requirements for all types of slaughterhouses would be so extensive that it would lead to confusion for small slaughterhouses and would not be sufficient to meet the needs of a cold-room type slaughterhouse.

Therefore, we must try to present some construction and set-up principles applicable to slaughterhouses in general. In addition, from the sanitary point of view, be it in small or large slaughterhouses, problems are similar and differences are owed to size more than type.
The following points must be considered when building a slaughterhouse: define what operations must be conducted in each department and provide the facilities and necessary means to carry them out efficiently; recognize and include veterinary inspection requirements even as to the smallest details; and properly meet country-wide, municipal or city-wide construction requirements.

III. SLAUGHTERHOUSE DIVISION

The type of operations conducted in a slaughterhouse requires that it be divided into departments or rooms, each one separate and different from the next. When special operations are conducted, these must be separate from the rest. Therefore, slaughterhouses must be divided into various rooms under five general classifications.

1. Edible product departments

This classification includes all the departments where edible products are handled in regular meat trade, such as slaughtering and dressing rooms, edible waste room, entrail room, cold and freezing rooms, packing material warehouses and elevators that handle edible products as well as the room to separate rumen and reticulum from the omasum and abomasum and intestines.

Slaughterhouses must be equipped with adequate facilities for intake and manure control.

Inedible product departments

This classification includes: inedible waste room, condemned or impounded product room, area to keep hide, blood tanks, inedible product elevators, area for the temporary storage of inedible product barrels, by-product preparation plant (blood, bone meal, meat, fertilizers and others).

a) Room for seizure: The slaughterhouse must have an adequate-size room to temporarily store impounded material in slaughterhouses. Entrails and intestines or impounded parts are stored there.
b) *By-product plant (kitchens):* It is not necessary to build a plant for by-products; however, it must be completely separate from the edible product sections and slaughter and processing rooms. Steam exhaust control through ceiling fans, condensers, etc. and installation of appropriate equipment for voiding, washing and cleaning operations make it possible to operate the by-product plant in a satisfactory and sanitary manner without interfering with the rest of the facilities.

c) *Hide room:* Hides must be stored in a cool, dark, well ventilated and fly-proof room that can be flushed clean. A concrete tank is often used to hold hide fluids during the curing period and emptied when hides are removed.

d) *Horn and ear room:* horns and ears removed from the head of the animal must be removed immediately from the slaughter room through a window with a drop-down closure. They are stored in this fly-proof room.

e) *Separation of edible and inedible products:* Departments for edible and inedible products (fat and tissues) must be completely separate. The necessary communicating doors must close automatically and, in the case of by-product and entrail areas, they must be equipped with a ventilated foyer for fumes, odor and fly control. All openings between the various areas: edible by-product and seizure rooms or between the slaughter and processing areas, use the principle of gravity. We recommend only one communication door between the edible by-product and impounded product rooms or between the slaughter and dressing room and the impounded product rooms.

2. **Tripe department**
Tripe must be cleaned in a special room that is accessible from the rumen and reticulum washing room.

3. **Neutral areas**
An adequate area needs to be available for operations that do not involve edible products but which could involve objectable conditions. These areas usually engage in special tasks such as the manual extraction of mesenteric fat, calibration or storage of processed tripe.

4. **Departments not involved in operations**
This classification includes:
a) *Boiler room*: The boiler(s) may be included in the slaughterhouse if fuel does not cause undesirable conditions. Most slaughterhouses install the boiler in a separate building to ensure safety.

b) *Compressor room*: Compressors must not be where they can be contaminated through regular operations.

c) *Office of the official veterinarian in charge and his line inspectors*: Regulations demand that slaughterhouses that are officially inspected have an office for exclusive use by the official veterinarian in charge and an office for line inspectors. This office must have natural lighting and adequate temperature and be sufficiently large to permit clothes changing and work operations: 32 square meters for the veterinarian and one for line inspectors. This area includes toilet, urinal, shower and changing area, hand cleaning and disinfection facilities and closet space. It must have a desk and chair, a filing cabinet, a cabinet with lock, and electronic equipment for desk work.

d) Specific area for chlorine measuring, and to keep chlorine, only for authorized personnel.

II. GENERAL CONSTRUCTION INFORMATION

With this preliminary information regarding the division of a slaughterhouse into departments (rooms) and areas and methods of operation it is possible to build a slaughterhouse of the appropriate size and apply basic sanitation principles to its design and construction. Maintenance of a slaughterhouse is costly. Therefore, it is better to use the most durable materials available for new construction or improvements.

a) *Location*: The location of the slaughterhouse must meet the following requirements:

1. The slaughterhouse must be built preferably in areas zoned as industrial by the local municipality.
2. The slaughterhouse must be located preferably in areas where urban growth is not expected and opposite to predominant wind direction.

3. Access to the slaughterhouse must be through paved or asphalt roads to facilitate the transportation of cattle to the slaughterhouse.

4. The land where slaughterhouses are built must be large enough to accommodate the different indoor and outdoor areas in order to facilitate their operation and treatment of liquid and solid waste.

5. Slaughterhouses must be built on land where it is easy to install general drainage.

6. Slaughterhouses must be located 2.5 Km from any town or industrial area that might pose a threat to the products they process.

**General areas:** General slaughterhouse areas include areas where slaughtering, processing, dismembering, cooling, boning, packing and freezing operations are conducted. These must meet the BPM, EES and POE sanitary requirements as well as HACCP.

**b). Area outside of the slaughterhouse:**

1. This area must have a peripheral fence to prevent the entry of animals, persons and vehicles without proper control. The peripheral fence and pen and processing areas must be built out of solid materials.

2. There must be pens for the receipt, isolation, and rest of cattle and for ante-mortem inspection with an area of two point five square meters (2.5 m²) for each animal.

3. It must have aerial walkways for pen inspection prior to slaughtering with enough natural lighting or with a source of artificial light in every area.

4. It must have a raceway from the pens to the entry of the slaughter and dressing room; before entering the slaughter room, a dark area must be established with a water curtain and before that must be a cattle spray bath area with feet washing facility and this with a minimum pressure of 120 P.S.I. (pressure per square inch).
5. In the establishment there must be no other buildings, industry of houses foreign to the slaughtering and dressing activity of cattle and of industrial meat and by-product processing. If there is housing for the personnel of the facility it must be separated by a peripheral fence to prevent the entry of animals, persons and vehicles and it must have basic independent services communicated with the general sewage network.

6. The area for chlorination and chlorine must be identified, be secured and the key must be managed by the competent person designated for that purpose by the organization.

7. Water deposits and water deposit covers must be secured and their locking system must be managed by the competent person designated by the organization and built in such a way as to efficiently prevent contamination and pest entry.

8. Each slaughterhouse must have a device to ensure that residual chlorine is never lacking in water.

9. The slaughterhouse must have a collection system for the digestive system and intestine content. Registration boxes must be included along piping. Building a collector is necessary when the slaughterhouse has not implemented a system to collect waste directly into a transportation deposit.

10. The transportation deposit must be airtight to prevent spillage.

11. Every area around the building must be clean and free from organic and inorganic matter that may be a potential source of contamination or of pest pollution, except the area for temporary deposit of waste that must meet requirements established in BPM, EES and POE sanitation manuals.

12. Buildings and facilities must be closed and built in a way that prevents the entry of insects, birds, rodents and other pests.

13. The slaughterhouse must have properly identified and strategically located trash collectors.
14. There must be a specific area to temporarily keep impounded products outside of the building’s facilities that meets sanitation and health conditions.

15. There must be a specific area to wash equipment and containers whose design and construction must meet sanitation conditions.

16. The slaughterhouse must have specific facilities for building and equipment maintenance.

17. The slaughterhouse must have a specific warehouse for chemicals to clean and disinfect surfaces, utensils, equipment and facilities. It must meet BPM requirements.

18. Slaughterhouses must have specific facilities to keep slaughtering and dressing equipment which is not in use.

19. The slaughterhouse must have general facilities to keep cleaning equipment and utensils where they are used. They must meet BPM sanitary requirements.

c). Areas inside the slaughterhouse:
This part of the slaughterhouse includes all the areas that provide facilities for different slaughtering, dressing, boning, cooling, packaging and freezing activities. Enough refrigerated space must be available to properly manage carcasses and meat products.

1. There must be enough refrigerated space to properly manage carcasses and meat products.

2. There must be an efficient sewage system and pipe network for the facilities. The property and all the sewers must have siphons and breathing points.

3. Water must be potable, abundant and must meet the COGUANOR standard in force. Every slaughterhouse must communicate its water source and must permit its inspection, its deposit facilities and distribution system. Non-potable water must only be used in authorized slaughter areas where edible products are not prepared or handled and only for limited uses, like ammonia condensers that are not connected to the potable water system, in steam lines that are part of the
clarification (fat) tanks for products that are not suitable for consumption, in connection with equipment used to crush and wash these products before placing them in tanks and in sewage lines to remove heavy products deposited in them. At any rate, non-potable water pipes must be clearly identified and must not cross with the potable water system, except in case of fire, provided the connection is fitted with a valve that prevents accidental contamination and is approved by the Official Meat Inspection System.

4. Blood that comes directly from the bloodletting area (approximately 9 liters of blood per head on average) must drain directly into blind sewers or pipes that can lead directly to cooking plants, if any, completely separate from the building where the carcass and meat are processed.

5. Water containing large material (tissues, fat, blood and clots) from the slaughter and processing room must drain directly into sewers with traps for solids and allow water that is free from these materials to flow to the appropriate places.

6. Blood coming from the slaughter room must not be mixed with the manure to prevent odors.

7. The contents of the digestive system and intestines from the area for cleaning of these entrails must drain directly into sedimentation sewers for proper handling.

8. A suitably sized fume exhaust system must be strategically located in the slaughter and processing room to effectively vent fumes from the carcasses and entrails.

9. All the equipment and pipes, tanks, containers, cooling towers and similar equipment used for reusing water must be built and installed in a way that makes them easy to clean and inspect. Potable water supply lines must be properly installed to prevent pooling and backups and built and installed in a way that makes them easy to clean and inspect.

10. Plumbing: must be installed and maintained to prevent hazards to public health, such as crossed connections, backups, blockage of the drainage system and leaks.

11. Backups: backing up of waste or polluted water in plumbing fittings or equipment due to negative pressure in pipes or the supply system must be prevented.
Negative pressure or partial vacuum may occur in any water supply line due to obstructed pipes, sudden demand for a large amount of water anywhere in the system, pump breakdown or breakdown in the water distribution line, especially the main lines. The danger of backups can be prevented by eliminating underground water lines or by placing a functional vacuum regulating valve between the last closure valve and the underground line. Wherever possible, there must be a large air space between the water supply line and the level at which the water or other fluids can accumulate intentionally or accidentally. This applies to sumps, cleaning and disinfection stations, plumbing accessories, equipment, and storage tanks.

12. Full drainage and reused water elimination, equipment cleaning and renewal with potable water must be conducted as frequently as necessary to ensure the provision of adequate water for the purposes of the facilities. The use of drainage and reused water disposal, the effective cleaning of equipment and potable water renewal must be done at the necessary intervals to guarantee acceptable water volumes for facility needs.

13. In facilities where underground piping cannot be avoided (table to process tripe, thawing tanks, some sterilizers), they must have functional regulating vacuum valves.

14. A proportion of approximately 1 to 2 ppm of free residual chlorine must be used everywhere to make cleaning effective in equipment that needs potable water renewal and in areas listed in sub-paragraph 9.

15. Water must be used at 82 °C. (180 °F.) at a constant pressure and which ensures complete cleaning and disinfection.

16. Hot and cold water outlets: the slaughterhouse must have hot and cold water with enough pressure. Hot water must be provided by a central tank with adequate capacity or through any other system that is adequate to the needs of the slaughterhouse. For cleaning equipment, floors, walls and other areas subject to contamination by contact with infected carcasses or viscera, minimum water temperature is 82 ° C. (180 ° F) This requirement applies to water temperature in the place of use and, if necessary, can be controlled by properly installed thermometers. The valve system for mixed hot and cold water or hot water and...
steam is not acceptable when hot water must be used to sterilize equipment or material contaminated by infected areas. Hot water under pressure for cleaning of rooms, equipment and areas other than those mentioned above must be provided by well-placed outlets. Pipes must be installed by avoiding dead ends or blind pipes.

17. The following requirements must be met by each slaughterhouse type:

<table>
<thead>
<tr>
<th>TECHNICAL PROCESS CONTROL LEVELS AND REQUIREMENTS</th>
<th>CATEGORY &quot;A&quot;</th>
<th>CATEGORY &quot;B&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location away from contamination sources and where it does not harm the environment and third parties. 2.5 km of any town or contamination area</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Health protection area (peripheral fence)</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Potable water and waste disposal systems</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>2.50 sq. meter reception pen for each cow</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Holding pen with water holders</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Observation and isolation pens</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Vehicle washing and disinfection area</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Scale for weighing live animals.</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Platform for use by MVOE and MVOC for ante-mortem examination.</td>
<td>YES</td>
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<tr>
<td>Cattle footbath</td>
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<td>YES</td>
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<tr>
<td>Dark tunnel with water curtain to prevent insects.</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Slaughter chamber</td>
<td>YES</td>
<td>YES</td>
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<td>TECHNICAL PROCESS CONTROL LEVELS AND REQUIREMENTS</td>
<td>CATEGORY “A”</td>
<td>CATEGORY “B”</td>
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<td>-------------------------------------------------</td>
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<tr>
<td>Vomit or relief area</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Bleeding and beheading</td>
<td>YES</td>
<td>YES</td>
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<td>Hide skinning bridge</td>
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<tr>
<td>Area to cut the breastbone open</td>
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<td>YES</td>
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<tr>
<td>Evisceration area</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Area to cut carcass into half carcasses</td>
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<td>YES</td>
</tr>
<tr>
<td>Carcass inspection area</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Carcass cleaning area</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Carcass holding area</td>
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<td>YES</td>
</tr>
<tr>
<td>Half carcass washing area</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Anti-microbial rinsing</td>
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<td>YES</td>
</tr>
<tr>
<td>Half carcass weighing</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Area for carcasses under observation or retained</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Carcass draining area</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Carcass refrigeration between 4.4 °C. to 7.2°C. with capacity according to slaughtering volume</td>
<td>YES</td>
<td>OPTIONAL</td>
</tr>
<tr>
<td>Deboning area with maximum 10°C ambient temperature</td>
<td>OPTIONAL</td>
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</tr>
<tr>
<td>Fresh product maintenance warehouse - 2.2°C = 28 °f.</td>
<td>OPTIONAL</td>
<td>OPTIONAL</td>
</tr>
<tr>
<td>Freezer at not less than -18 °c.</td>
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</tr>
<tr>
<td>Necropsy area: (outdoor area)</td>
<td>YES</td>
<td>YES</td>
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</tbody>
</table>
### TECHNICAL PROCESS CONTROL LEVELS AND REQUIREMENTS

<table>
<thead>
<tr>
<th>CATEGORY &quot;A&quot;</th>
<th>CATEGORY &quot;B&quot;</th>
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<tbody>
<tr>
<td><strong>Incinerator</strong></td>
<td>YES</td>
</tr>
<tr>
<td><strong>Inedible by-product processing</strong></td>
<td>OPTIONAL</td>
</tr>
<tr>
<td><strong>Machine room inspection (boilers and other)</strong></td>
<td>YES</td>
</tr>
<tr>
<td><strong>Seizure deposit (condemned product)</strong></td>
<td>YES</td>
</tr>
<tr>
<td><strong>Aerial dressing system</strong></td>
<td>YES</td>
</tr>
<tr>
<td><strong>Area to clean “green” entrails separate from slaughter patio</strong></td>
<td>YES</td>
</tr>
<tr>
<td><strong>Refrigerated chamber to store green and red entrails</strong></td>
<td>YES</td>
</tr>
<tr>
<td><strong>Area to process fore and hind legs</strong></td>
<td>YES</td>
</tr>
<tr>
<td><strong>Head processing area</strong></td>
<td>YES</td>
</tr>
<tr>
<td><strong>Area to store skin or hide and tallow</strong></td>
<td>YES</td>
</tr>
<tr>
<td><strong>Carcass rail weighing scale</strong></td>
<td>YES</td>
</tr>
<tr>
<td><strong>Gastro enteric content and other waste disposal and solid and liquid contaminant treatment.</strong></td>
<td>YES</td>
</tr>
<tr>
<td><strong>Laboratory: (Safety analysis)</strong></td>
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<tr>
<td><strong>Veterinary inspection</strong></td>
<td>YES</td>
</tr>
<tr>
<td><strong>Water deposits</strong></td>
<td>YES</td>
</tr>
<tr>
<td><strong>Storeroom and warehouse</strong></td>
<td>YES</td>
</tr>
<tr>
<td><strong>Maintenance service area</strong></td>
<td>YES</td>
</tr>
<tr>
<td><strong>Worker dressing rooms</strong></td>
<td>YES</td>
</tr>
</tbody>
</table>
V. CONSTRUCTION MATERIALS

Construction materials mentioned in this Manual may be changed by materials at or above the minimum standards. The ideal type for the construction of a slaughterhouse is reinforced concrete because it offers major advantages including among them: easy sanitation maintenance, long duration, slow depreciation and fire protection.

Materials used must be easy to clean, waterproof and resistant to wear and corrosion. Absorbent materials, difficult to clean (wood, plaster and cardboard porous acoustic type) are generally unacceptable in food processing areas.
VI. ELEVATION ABOVE GROUND LEVEL

A slaughterhouse must never be built at ground level. The mere fact that meat and waste materials must often be driven by truck justifies the elevation of the main floor above the ground. It is also very difficult, if not impossible, to repair pipes and other installations when necessary unless they are made accessible via a raised floor.

Therefore, the first floor level must be at least 1.20 meters or more above the ground in the loading platform, not counting the ramp angle needed to reach that height. This allows and facilitates loading and unloading, as the height of the platform coincides with the freight truck used to transport standard meats.

VII. FLOORING

Floors must be constructed of waterproof material, usually concrete. The concrete must be of good quality, properly reinforced with iron rods or heavy wire mesh or other reinforcement commonly used in construction. The bulk of the concrete slab must not be less than 6 cm. in drains (assuming that this is the thinnest part). The harsh treatment of these floors for forklift traffic and handling of heavy equipment makes it imperative that the slab be sufficiently thick and reinforced to prevent cracks and other damage.

From the sanitation point of view, the slab must remain intact to prevent leaks that cause unclean conditions.

In practice it is recommended that the floors have a gradient of ¼ to 3 / 8 inch per foot toward the drains. Less than ¼ inch is not advisable, because the human factor comes into play here and even the best operator could fail and build areas with a gradient less than estimated, which would be of no value. More than 3/8 is too much, except in the area of bleeding and beheading.

To prevent accidents, floors must not be overly smooth and must be a non-skid surface. In a slaughterhouse in operation there is always water on the floor, at times mixed with blood or other substances which make smooth floors slippery and where operators can suffer dangerous falls. Many countries use certain anti-slip agents that are mixed with the concrete or applied on it. One is aluminum acid in the form of fine sand or ashes scattered on the concrete when it starts to set. This requires care to prevent the anti-slip agent from...
sinking in the concrete and not doing the job. Carborundum powder can also be used as an anti-slip agent.

There is evidence that the floor slab must end ¼ inch over the edge of the drainage canals, falling sharply on the metal edge of the drain. This type of installation allows for long duration despite traffic over the drainage canals, preventing wear of the concrete edge in the seating of the drainage grid. When this happens a lot of water and materials remain on the surface and decompose.

In the design phase, the location of pipes, electrical connections and refrigerant lines must be carefully planned, providing channels on floors and pipes in the walls without breaking the floors or walls to avoid damage to the waterproof cover.

Curbs on floors must be 15 cm high by 15 cm. wide. These edges or curbs must be used in areas where it is necessary to prevent liquids or organic matter from contaminating other areas and include: vomiting or relief, bleeding, retained carcass, quarantine pens, inspection tables, and other areas as needed.

Concrete or mortar floors with a latex or synthetic resin base are more resistant to grease and acids.

Avoid cracks, crevices and depressions that could lodge fluids.

VIII. INDOOR WALLS
It is essential that the walls are built of waterproof material. In any room or area, the minimum height of waterproof plaster is 1.80 m. above the floor, but the plaster must cover the full height of the rails in the slaughter, waste, refrigeration and every department whose operations make it necessary to plaster the entire height of the wall. The most widely used waterproofing agent is finely finished Portland cement plaster. Granite flooring as waterproof agent is recommended for its durability and easy cleaning operations of walls that get dirty during normal operations.

Plastic panels on windows must have smooth surfaces and be protected from damage that could result in operations.

Window sills must have a gradient of 45 °.
At the junction of floors and walls in every room all baseboards must be concave (sanitation curve) with adequate coverage to maintain hygiene.

**IX. DOORS**

The openings of doors, if used for passage of carts or carcasses transported through rails must be at least 1.50 meters wide.

Doors must be of galvanized metal, wood or coated on both sides with sheets of corrosion-resistant metal, with welded or bent joints.

Door frames must be covered with stainless metal, without crevices that may trap debris or insects. Joint lines with walls must be effectively sealed with a flexible compound.

**X. CEILINGS**

Ceilings must have a height of three meters above the ground or more in areas where operations are carried out. In areas with high rails higher ceiling altitudes are needed. Cold rooms have rails at a height of 3.40 mts. The ceiling must at least have a height of 4.20 meters to install refrigeration units on top. Freezers with low rails (lines of 2.30 m.) must have ceilings of 3.30 m. or more.

The ceiling of the slaughter and dressing room must be the reverse of the roof frame in most cases. This room must not be closed at the rail beam. Instead, this room must be kept open up to let vapors escape, let in light and ensure better ventilation. This way, machines in high places, plumbing and others are readily accessible for inspection and maintenance. Since these areas may be an important source of direct contamination of the products they must be kept free from peeling paint or plaster, dust, condensation and leaks.

Electric wiring and pipes overhead and hooks that are not in use must be eliminated because they constitute an unnecessary source of potential contamination. Routine cleaning of overhead structures is essential.

Ceilings must be smooth and flat. They can be of Portland cement or other waterproof
material. If the ceiling has exposed beams, they must be at least 90 inches at the center and designed so that there are not too many edges or crevices that are difficult to clean.

XI. VENTILATION
The cleanliness of the plant is closely related to the proper design of ventilation equipment. Fumes and odors must be eliminated quickly, so they cannot be absorbed by products. In addition, vapors, including water, can significantly reduce visibility, thus limiting convenience and work efficiency in veterinary inspection. To avoid the formation of steam in the room it must be equipped with fans (exhaust fans) when you need a strong current of air to expel fumes.

Operation rooms and the dressing room must have fresh air intakes fitted with effective filters to eliminate odors, smoke and others, as well as to keep out insects and dust in work areas that are not refrigerated and in the dressing rooms that are entirely dependent on artificial means for ventilation.

XII. PAINT
Do not use paint that can chip and produce unacceptable conditions in production rooms and areas. Currently there are companies specializing in the application of specific paint for food processing plants so the slaughterhouse must receive technical advice from a professional on coating applications.

XIII. STAIRS
In departments where edible products are handled, stairs must be constructed of waterproof materials with solid steps and the riser must be closed and 15 inches tall.

XIV. METAL CURTAIN
The slaughterhouse must be adequately protected against birds, dogs, cats and pests including insects and rodents. All windows, doors and other openings that could allow entry of insects must be equipped with shutters. Over the openings of the outdoor walls of areas used for shipping and receiving food, "flycatcher" tubes or ventilators shall be installed.

To prevent entry of rats and other rodents, at the junction of walls and floors must be embedded, horizontally and vertically, wire mesh not exceeding half an inch, except for solid masonry walls built with tiles, glazed brick and others.
XV. LIGHTING IN THE SLAUGHTERHOUSE
To maintain good cleaning conditions, adequate lighting is essential. It is impossible to perform the tasks of the slaughterhouse sanitation and cleaning of the carcasses effectively if light is not abundant. Contamination cannot be avoided if possible sources cannot be properly seen.

There must be adequate lighting in all areas where food and ingredients are processed, tested or stored, where equipment and utensils are washed, as well as in cleaning stations and hand disinfection, dressing rooms, closets and toilets. Lamps, fixtures, skylights or other lighting surfaces must be sufficiently safe or adequately protected to prevent contamination in case of breakage. This can be achieved with an unbreakable shield material such as Plexiglas.

Colorless and high transparency materials must be used for windows and skylights. To reduce glare from skylights and windows that receive considerable sunlight, light diffuser color-absorbent materials must be used (blue).

In a work room with no refrigeration, the areas occupied by the windows must cover about ¼ of the floor surface. The ratio must be higher where there are adjacent buildings, galleries or forklifts that interfere with direct entry of natural light. In places or times when you do not have adequate natural light, well distributed artificial light is required. The artificial light must not produce any color distortion.

The total intensity of artificial lighting must be:
1. Inspection areas: 50 foot candles
2. In places where special lighting is required to allow employees the proper preparation of products to meet requirement: at least 50 foot candles.
3. Cold storage: minimum 10 foot candles at the shoulder of the carcass.
4. Areas where suspect animals are kept: 20 foot candles
5. Work rooms shall be not less than 30 foot candles
6. Ante-mortem inspection areas: not less than 20 foot candles three feet off the floor
7. Inspection area: 50 foot candle at jaw level
8. Heads washing area: 50 ft candles at the head
9. Carcass inspection area: 50 foot candle at the first cervical vertebra
10. Viscera inspection area: 50 foot candles at the surface of the platform
11. Final inspection rail: 50 foot candles at the shoulder of the carcass.
12. Re-inspection rail: 50 foot candles at the shoulder of the carcass.

XVI. SLAUGHTERHOUSE REFRIGERATION

Adequate refrigeration is one of the most effective means to control the growth of microorganisms. It is imperative to have adequate refrigerated space to manage carcasses and products.

1. The highest temperature allowed in areas where products are handled like deboning room must be no greater than 10 °C = 50 °F.
2. Carcass storage areas: not more than 4.4 °C = 10 °F.
3. Freezers: Not less than -17.8 °C = 0 °F.

Each refrigeration system must be installed so as to prevent meat product contamination.

1. If wall evaporators are used (diffusers), drainage channels made of concrete or other waterproof materials must be installed beneath them, joined to the floor and properly connected to the drainage system.
2. If air cooling systems are installed, drip pans must be placed under them, connected to the drainage system and must not be above where there are meat products.
3. Ground refrigeration units must be placed within areas bordered by a baseboard, with separate drainage ditches or adjacent to floor drains.
4. Aerial brine spray refrigeration equipment must be maintained in good condition to prevent leakage or other contamination of carcasses and other products.

XVII. PLUMBING IN THE SLAUGHTERHOUSE

Plumbing is a particularly important aspect to be considered in food plants. If facilities are not made and maintained properly, dangerous situations can occur to public health, such as cross connections, return siphoning, interruptions of the drainage system, or leaks. Any of the aforementioned disadvantages can cause serious water, product, equipment, or utensil contamination, cause unpleasant odors or other nuisances.
If water pressure is reduced due to the inappropriate size or the poor condition of the pipes, washing operations and equipment pieces that depend on sufficient pressure and volume for their operation can be affected.

In general, the size of the installation and maintenance of all plumbing must comply with Government laws and regulations.

The concept of plumbing covers several areas, such as:

a). Water supply
b). Drainage
c). Waste disposal

Each of these must be treated separately, since they involve also other health issues.

a). Water supply:
1. Drinking Water: An adequate supply of clean fresh water at a pressure of 120 PSI. is of paramount importance to plant cleanliness and operations. The first requirement is that water be drinkable, which simply means that you can drink it or that it is suitable for human consumption without treatment by boiling or adding chemicals.

2. Potability requirements:
2.1 Physical characteristics: Water must not contain impurities offensive to sight, taste or smell.

2.2 Microbiological quality: Water must not contain microorganisms that may be a potential threat to human health. Virtually every disease known as water-borne is caused by organisms that are eliminated through feces.

Therefore, contamination of water with fecal material represents one of the most dangerous forms of pollution. Because coliforms bacteria are universally present in the stool, laboratory tests for this group must provide indications of the number of intestinal bacteria present. Coliforms count usually is a measure of water safety.

2.3 Chemical Characteristics: Water must not contain chemical impurities in concentrations that may be hazardous to the health of consumers, and must not be
excessively corrosive to the supply system. It must not contain residues of substances
used for treatment at concentrations greater than necessary.

Water must not contain substances that may have a harmful physiological effect, or
whose potential effects on the body are unknown.

2.4 Radioactivity: The exposure of humans to radiation is harmful. Therefore, water must
not contain radioactive materials.

At a minimum, water in the plant must pass potability testing prescribed by local or
international rules and regulations.

Slaughterhouse management is responsible for periodical water testing by an approved
laboratory, which certifies that it meets the specifications of the Official Meat Inspection
System (SOIC).

If drinking water is obtained from private wells, they must be in the premises and be
effectively protected from contamination. To prevent contamination it is essential to
prevent the entrance of polluting material directly from the surface or the water coming
into the well with inadequate filtration through the soil.

Normally, precautions must be taken so that water filtered through ten feet of soil cannot
enter the well. Wells must be placed on higher ground than the sources of pollution
consisting of septic tanks, cattle pens, areas where inedible or condemned products are
managed and at a safe distance from them. The distances are usually specified in local and
international standards.

If chlorinators are needed to ensure a continuous supply of potable water, they must be
automatic and equipped with devices that enable plant management and the inspector
to know when they stopped working.

If using an approved public water supply, laboratory certification based on quarterly
samples taken within the distribution system of the plant is sufficient.

Water from private wells must be tested every three months. If at any time the inspector
suspects that the slaughterhouse’s water supply is unacceptable, take samples
immediately and discontinue use.
The samples for certification must be taken at various points in the distribution network.

The purpose of sampling is twofold: first, to determine the potability of water supplied to the plant, and second, to establish that there has been contamination within the distribution system of the plant.

Generally, samples must be taken in as many different areas of the plant as practically feasible.

3. Possible sources of contamination within the plant include, but are not limited to the following:

3.1 Non-potable water supply: The use of non-potable water is a potential source of danger. In some abattoirs, the supply of drinking water is limited and expensive, and uses non-potable water from a river, lake or well is not approved. This water can be used in certain restricted areas, but special care must be taken that there are no cross-connections between distribution lines and potable water.

The use of non-potable water is allowed only in those parts of the plant where inedible food products are handled or prepared, and only for limited purposes, such as ammonia condensers not connected with the drinking water line, steam pipes serving tanks for inedible product fusion, in connection with the equipment used for washing prior to the fusion of inedible products, and sewage systems for separating heavy solids from wastewater.

The use of non-potable water is not allowed to wash floors, areas or equipment involved in transporting material to and from edible product departments, steam lines serving for the fusion of edible products or to clean pens, bleeding areas or ramps within the slaughter and dressing room.

In all cases, non-potable water lines must be clearly identified and must have no cross-connections with the drinking water system.

Connections can be made between the potable water and non-potable water sources in cases of fire, but normally there must be complete separation between them, which must not be based solely on the use of valves, since they can leak or be opened accidentally. In
each case, connections must be approved by the Official Meat Inspection System.

3.2 *Return siphoning*: Return siphoning is the backflow of used, contaminated water, in plumbing fixtures, equipment, due to negative pressure in the pipe or in the supply system.

Partial vacuum or negative pressure can occur in any supply line due to blocked pipes, sudden demand for a large amount of water anywhere in the system, pump failure, a breakdown in the water distribution line (particularly in main lines).

In multistory buildings, the force of gravity can increase the intensity of partial vacuum.

The danger of siphoning can be prevented through the elimination of underground water distribution lines, or using a vacuum valve between the last functional regulator valve and the underground line.

Where possible, there must be a large air space between the water supply and the level at which water or other liquids can accumulate intentionally or accidentally. This applies to sinks, lavatories, plumbing fixtures, equipment, storage tanks and even drain hoses in wash tanks.

In installations where submerged pipes are inevitable (table to process tripe, thawing tanks, sterilizers), functional vacuum regulator valves must be placed. In case of partial vacuum, the vacuum regulator must let air into the water pipe, and as the air is much lighter than liquids, the aspiration of contaminated water into the supply system is eliminated.

The only acceptable vacuum regulators are functional. One cannot prevent back siphoning by the use of so-called one-way valve. Vacuum sealed regulators must not be used because the mechanism can be blocked or frozen in the open position.

The simplest and most effective type of vacuum regulator valve is open or purge valve placed between the valve and the water outlet.

In systems where several submerged lines feed off a main line, one vacuum regulator positioned between the main control valve and the first submerged line is enough. An own waterline.
3.3 Potable water tanks: The temporary water tanks of the plant must be constructed properly to prevent contamination of its content and the lid must be designed so as to prevent the entry of pests. Open tanks are not acceptable.

**Deposits must have no unused areas and water must circulate freely to avoid stagnation.**

4. Pipes: The identification of the pipes according to usage must help prevent product contamination. The facility can use the following recommended system:

- a. Fire lines: Red
- b. Sewer: Black
- c. Gas pipeline: Yellow
- d. Air pipeline: White
- e. Potable water pipeline: Green
- f. Non-potable water pipeline: Black plus the name
- g. Edible Products Pipeline: Green plus the name
- h. Ammonia pipeline: Blue
- i. Hot water pipeline: Green plus red

Pipes must be installed by avoiding dead ends or blind pipes. No need to paint the entire pipe. It is sufficient to paint a color band at intervals of 30 cm.

Water pipes not in use must be eliminated, as having no free movement of water causes stagnation and this leads to proliferation of organisms that pose a hazard of contamination to drinking water.

When you separate or move old pipes, the water supply line can be seriously contaminated with rust and grease. After such repairs, pipes must be cleaned with abundant water discharges.

5. Hot and cold water outlets: The slaughterhouse must have hot and cold water with sufficient pressure. Hot water must be provided by a central tank with sufficient capacity or by any other convenient or suitable system to the needs of the plant.
For cleaning equipment, floors, walls and other areas subject to contamination by contact with infected carcasses or viscera, minimum water temperature is 82 °C = 180 °F. This requirement applies to water temperature in the place of use, and if necessary, can be controlled by properly installed thermometers.

The mixed system of valves for water and steam is not acceptable when the hot water must be used for sterilization of equipment or material contaminated by infected areas. Hot water under pressure for cleaning of rooms, equipment and areas other than those mentioned above must be provided by well-located outlets.

Water must be hot enough to allow thorough cleaning. The use of steam under pressure (live steam) is usually not an acceptable method for cleaning and sterilization of rooms and equipment. Steam temperature goes down very quickly once released, so it does virtually no cleaning or sterilization.

The method also has the added disadvantage of excessive steam into the environment, limiting visibility and further reducing the effectiveness of cleaning.

Steam spray cleaning and sterilization is an apparently impressive method but without any real value.

6. Ice: Slaughtering normally does not use ice but if the plant uses it, it must meet the requirements of the specific COGUANOR standard for ice.

Ice for human consumption or for use in direct contact with products or equipment for food preparation must meet the conditions and required quality for drinking water of the COGUANOR Standard in force.

Ice manufactured within the plant must be made with drinking water, in equipment that can easily be kept clean and produce acceptable quality ice. Carbon snow, flakes or block of ice deposits must be coated with stainless steel or another high quality galvanized metal.

The metal must be thick enough to withstand repeated blows from the shovel without getting holes.

In the bottom of the deposit compartment must be drip pans of galvanized metal that
may be removed and that are adequately perforated; trays must be inspected frequently to ensure cleanliness.

Some of the equipment used for the production of ice flakes is constructed so that the water resulting from melting is collected in a space provided below the deposit compartment. This water cannot be reused for the production of ice or be allowed entry into drinking water pipes.

There is no objection to pre cooling water used for the manufacture of ice, making it circulate through closed coils immersed in cold water below the deposit compartment.

Monitoring equipment for the preparation of ice at the plant is part of routine sanitation inspection.

Ice used but not manufactured at the inspected plant must be purchased from approved outside suppliers. At least every six months and whenever requested, the plant management system must provide the Official Meat Inspection System, a certificate of guarantee of the potability of ice used and of its clean handling.

Ice must be rejected if not supplied by external certified sources.

For manufacturing, storage, transport, unloading and handling in the plant of edible ice only sterilized utensils must be used.

Periodically, samples must be taken of the ice in aseptic conditions for testing to determine bacterial contamination.

Sampling and analysis must be performed by laboratories, or through tests recognized by the Competent Authority.

Samples of ice made in the establishment must be taken at the same time as water samples. The ice obtained from outside vendors must be reviewed four times a year; samples must be taken at the time of receipt.

7. Water certificate files: Each facility must allow, at any time, the inspection of its water supply line, deposits, distribution system and ice supply. In all plants, inspectors keep in their offices a file with:

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7.1 General certification that the water used in the facility meets requirements for drinking.
7.2 The results of regular sampling of water;
7.3 Information relevant to that particular plant (location of wells, use of unsafe water, special problems);
7.4 Record of inspections

b). Drainage
It is important that the drainage system of the plant is designed so as to allow the prompt removal of waste liquids and solids. It is a serious health hazard that these contaminated fluids accumulate or travel long distances on the floors. The accumulation of waste leads to unpleasant odors in the work areas and render proper cleaning impossible, greatly increasing the possibility for product contamination. For reasons of sanitation, the sewer system is divided into two separate parts:

a) General slaughterhouse drainage pipelines (floor drains, cleaning stations and disinfection, equipment and others).

b) Restroom pipelines, connected to toilets and urinals.

c) General slaughterhouse drainage pipelines: The general drainage system begins with the floor drains in the sinks or the nozzle of a piece of equipment that uses large amounts of water.

Each outlet must use a canister (mesh) to collect solids from the floor to protect from pipe occlusion due to dirt.

There must be sufficient gradient in drainage lines to ensure proper flow of solids through the pipe.

Solid waste produced in slaughterhouses is such that it is necessary to remove them before they reach the final sewage disposal.

The removal of fat and other solids is done in a trap or grease collector. The operation of a collector or sump operates on the principle that the flow of water passing through a pipe and discharged into a large tank slows it down. The material that is heavy enough must sink; this sedimentation is best achieved by slowing down the flow of water through
baffles or deviation. Material that floats rises to the surface and high deflection plates stop the forward movement of these floating particles.

From the sanitation point of view, it is necessary to remove fat to avoid clogging the pipe underground and it is, in turn, a prerequisite in almost all types of slaughterhouses. It is also imperative to complete the use of surface drainage, pit drainage, or any other type of drainage with filtration in the soil.

Solids can be removed as the internal current from the sewer goes out, by gradually lowering the water level of the collector until the material can be removed from the bottom by hand. Therefore, the exhaust must be low enough to allow complete drainage of the deposit.

The collector must drain into the pipe of a septic tank, filters and others. For all these operations, one can easily understand why it is so important that the gravity factor be taken into account and therefore the recommendation is to use the most adequate design for the slaughterhouse to take advantage of it.

b. Restroom pipes. This plumbing must not be connected to other drains in the plant. Nor must it drain into a grease sump or enter the sewer network in places where there is a possibility that the waste material might flood the floors of the facility. The pipeline for restrooms must be separate from the slaughterhouse and drain into public sewers or directly into a septic tank, or through a pipe connected to the effluent of the last collector in the slaughterhouse.

c. Floor Drain:
All departments where operations involving the handling of liquids are performed must have floor drains. As a general rule, a 10 cm. diameter drain must be installed for each area of 36 square meters. The floor must have a gradient of about ¼ inch per foot toward the drains.

In cold rooms and other places where limited amount of water is used, the gradient of the floor must be about 1/8 inch per foot. It is important that floors have a slope toward the drains evenly, without indented areas that may store liquid. There is no need for floor drains in the freezing chambers or in dry storage areas.

In areas of slaughter and dressing, drainage channels must be installed below the carcass.
transportation rails. The channels are about 60 cm. wide with a pitch of at least 1/8 inch per foot toward the drains placed inside.

Floor drains, whether for water or blood, must have a deep trap of the "P", "U" or "S" types and be properly ventilated. The purpose of such traps is to seal the drain so that foul odors cannot get into the plant (sewage gas).

The effectiveness of the traps depends on retaining enough water to allow it to be shut off. When water flows through the trap into the drain pipe, there is a vacuum that breaks the seal, unless the drain is ventilated on the effluence side of the trap.

The shutter can also be broken by evaporation of retained water. These are not a problem in the drains frequently used, but in areas where they are used more rarely.

Drains must have metal grills to prevent entry of rats and mice. Covered drains, in addition to preventing access by animals, protect the traps and lines from obstruction by debris or other materials too large to flow freely. These grills must be securely in place, for being loose not only allows the passage of rodents but also constitutes a hazard.

d) Size and construction of drains:
All drains must be of sufficient size to allow rapid removal of waste. All piping from the floor must have an internal diameter of at least 15 cm.

The pipes to drain the contents of the digestive system of adult cattle must have a diameter of at least 20 cm to avoid occlusion. If several drains empty into a main pipe, it must be proportionately larger (enough to provide a safety margin of 50%)

The drains of the slaughterhouse must be constructed of durable and leakage-proof material.

Cleaning openings are placed along the drainage system so that in case of obstruction, the problem can be solved quickly.

These cleaning openings must be located so as not to contribute a risk of contaminating food products; they must be easily accessible and leakage-proof.

Pipes for blood: For blood, lines must be at least 5 inches and with a much steeper
gradient than in regular sewers. Two inches or more per foot gradient is advisable to ensure blood flow. The opening of the floor must be plugged, but trapped, although in this system it occasionally becomes necessary to remove sediment to ensure adequate flow.

**Blood tank:** It is recommended that slaughterhouses install a tank for temporary storing of blood satisfactorily. The closed system that provides a steam injector tank is ideal from a sanitary point of view, since it controls odors and provides an economical method for handling this product without causing inconvenience. Also, this product can be pumped from a closed storage tank.

e) Drainage of the outdoor area
All official areas of the plant must have a gradient and sufficient sewers to permit the rapid runoff of water used in buildings and surface water.

Running and surface water is generally much polluted and if puddles are left to form not only will they produce unpleasant odors but also serve as a breeding ground for insects.

The areas around the plant must be level, and lower parts must be filled. The places for loading and unloading cattle must be made of concrete, covering a distance of 6 meters from the buildings, loading areas, ramps and platforms and with adequate drainage confined to the area.

Drains must be installed in areas of product loading and unloading of cattle meat.

c) Waste treatment and disposal in the slaughterhouse
In the meat industry, like many others, waste control and elimination is a major problem. Optimal utilization and waste reduction is a key objective in production economics at all plants.

From the point of view of plant cleanliness, waste disposal involves two vital aspects:

1- Slaughterhouse waste contains most of the contaminants, dirt and pathogens that the sanitation program has removed from actual or potential contact with edible products. It is essential that this material be kept separately and that it be disposed of so it does not constitute a threat later for food products and human health.
2. Slaughterhouse waste, by its nature, is potentially harmful. The unpleasant smell and insect and rodent luring effects fully justify the need for safe, clean and effective disposal.

The waste from the plant is considered in four categories:

1. Disposal of waste water from bathrooms and from operation areas
2. Fat removal
3. Elimination of organic waste such as stomach content, hair, blood, and manure.
4. Garbage disposal

1. Disposal of waste water from bathrooms and from operation areas
The waste water disposal system used by the plant must be accepted by the Competent Authority: Ministry of Environment and Natural Resources). The opinion to obtain approval is necessary to obtain a Sanitation Operation License.

2. Tanks for the removal of fat:
Liquid waste from meat plants usually contains large amounts of fat. The recovery of this fat has certain economic advantages and is also a form of treatment of preliminary waste. Bathroom piping must not discharge in collectors or in grease traps, but they can join the effluents of these areas to become the total drainage of the plant.

Collectors are large tanks that receive drainage from the plant; upon draining the water, it slows down so that grease and other floatable materials rise to the surface to then be taken to incinerators in the inedible product department or the specific area for denaturation. Some solids settle in the bottom and must be removed several times during the day to prevent spoilage.

Once removed from the collectors, fat is transported in sealed containers. Solid substance from the bottom must be treated the same way.

Collectors must be conveniently located away from the edible product departments and from the areas where they are loaded or unloaded.

The area surrounding the collector must be paved with waterproof material (concrete) and provided with adequate drains.
To facilitate quick cleaning, the collectors must not have a lid and the bottom must have a gradient. They must be constructed so that they can be completely emptied of their content for full cleaning every day after the operations of the plant end. Close to the collectors must be hoses that must be connected to hot water outlets.

Grease traps are similar to the collectors in the sense that they allow fat to separate from other waste. These traps are considerably smaller and are not used for large-scale operations.

Grease traps can be installed only in plant drain pipes and must be cleaned regularly. The use of grease traps must not cause pollution.

3. Elimination of organic waste such as stomach contents, hair, blood, manure.
Waste materials such as stomach contents, hair, blood and manure from the pens must not be allowed to accumulate in or near the premises and must be removed without creating pollution conditions.

Manure that has been removed from the pens is often a problem. Immediate elimination is the best course of action, but under certain circumstances it is necessary to temporarily store manure.

Manure pits made of concrete and with sewers are necessary, because the piling up of manure on the ground is unacceptable. Even if you have adequate facilities for temporary deposit, there must be a plan to eliminate it at least once weekly and manure pits must be thoroughly cleaned before reuse.

Blood that is not processed within the plant must be removed daily in airtight containers, covered. The operation is performed in a paved area, well-drained and provided with water outlets. The area must be cleaned at least daily and at more frequent intervals if necessary.

Hair, the content of the digestive system and similar materials shall be removed daily. The slaughterhouse must consult with the competent authority of the Ministry of Environment and Natural Resources on how solid waste must be denatured to turn it into mud and prevent environmental pollution. If a septic tank or the plant’s own system of waste disposal is used, it must be designed and operated properly to avoid creating objectionable conditions at or near work areas.

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4. **Garbage:**
Trash (paper towels, cardboard, office supplies, etc.) can often create health problems. There must be suitable containers properly distributed through the slaughterhouse, which must be emptied frequently.

The accumulation of garbage prior to disposal or incineration must not cause problems.

5. **Incineration:**
The slaughterhouse must have an incinerator whose size meets the demand for incineration of viscera, carcasses and other condemned meat products. Its operation must not cause environmental pollution.

**XVIII. EQUIPMENT**
The equipment used for handling and processing of meat ranges from simple hand tools to larger, more complex machines operated electronically. As there is contact with the surface of product equipment, this is where there is greater potential for contamination.

Therefore, equipment must be constructed and maintained so that it can be easily kept clean. All surfaces in contact with meat products must be free of rust, be smooth, nonporous, without holes, cracks, crevices and joints which can collect debris that then decompose and favor the growth of microorganisms.

Equipment design and installation must be adequate for easy cleaning and disinfection.

The materials used in the area where edible products are kept must be absorbent, non-toxic, odorless and must be unaffected by food products and compounds used for cleaning.

**IXX. ACCEPTABLE MATERIALS**

1.1 **Metal:**
With few exceptions, equipment can be built either of corrosion resistant metal such as stainless steel 18 to 18 (300 series), or Plexiglas approved by the competent authority. Galvanized metal, although it is acceptable for some equipment, is not
advisable because it cannot withstand the corrosive action of food products and cleaning compounds. If it is used, it must be high quality hot dip galvanized metal.

1.2 **Plastics and resins:**

Plastic materials and resin coatings must be resistant to abrasion and heat, unbreakable, non-toxic and must not include components that can be transferred to meat or other products coming into contact with the material.

All materials and coatings must be approved by the competent authority. This approval is granted only to the manufacturer and on presentation of a report on the chemical composition, intended use, method of application, action on contact with water and products, and any toxicological data deemed necessary.

**XX. UNACCEPTABLE MATERIALS**

There are several highly undesirable materials or even totally unacceptable for use in making equipment. The following is only a partial list.

a) **Copper** and its alloys are not acceptable for equipment used in processing food products. In some cases copper discolors food, contaminates it with salts, and tends to catalyze the breakdown of fat. Copper pots are admissible provided that the inside is tinned and the coating remains intact.

b) **Cadmium and antimony** are toxic compounds and in no way acceptable in the equipment used for edible products.

c) **Lead** must not be used because of its toxicity, except in soldering and then, in a proportion not to exceed 5%. Antifriction lead, often used in the equipment for dividing heads into parts, is not acceptable. Approved nylon and other plastics are good substitutes.

d) **Enameled or porcelain** equipment may not be used for the high risk of cracking.

e) **Painted** surfaces are not inalterable and can easily contaminate food. Therefore, paint is not acceptable in any part of the equipment that can come into contact with meat products.
f) **Wood** is not a satisfactory material for the construction of equipment because the surface does not remain smooth and it is not waterproof. Its use is only allowed in situations where strict sanitation rules apply.


g) **Leather and fabrics** are not acceptable for the construction of equipment due to their porous nature. Fabric filter presses can be used to fuse fat provided that they are washed every day before use.


h) Certain **metals** must not be used in the construction of the equipment if contact with liquid or other products can lead to undesirable chemical or electrolytic activity.

**XXI. EQUIPMENT DESIGN AND CONSTRUCTION**

The principles of sanitation apply to the design of all types of equipment used for slaughtering and dressing livestock.

The **fundamental objective** of an appropriate design is to facilitate cleaning of equipment, controlling or **eliminating all risk of product contamination**. The continuing demands for greater production efficiency generally tend to increase the danger of contamination, because sometimes the time available for cleaning is limited.

**Time and ease to disassemble the equipment** are two important aspects.

Construction must be as simple as possible and contain few parts to allow it to be easily disassembled and reassembled after cleaning.

**Design, construction and installation** must be such as to allow easy access for cleaning and mechanical maintenance.

**XXII. PRODUCTION AREA**

1. **Accessibility for cleaning:**
   a. All production areas must be easily accessible for cleaning and inspection. All necessary steps must be taken to ensure that all component parts of large equipment can be cleaned and inspected, either through openings conveniently located, walkways, stairs and more. It is the responsibility of plant management to see that these requirements are met.
2. Cleaning systems in place (CIP) - (Clean In Place):

Cleaning designed for equipment system (CIP) does not require complete dismantling, provided, however, that equally effective and even better results are obtained. Cleaning of this type of procedure is allowed only under special conditions and must be individually approved by the Competent Authority.

The conditions for accepting CIP are:
- Cleaning solutions must be able to move through fixed parts.
- Such solutions must contact all surfaces inside.
- The system must have automatic drainage or must permit full emptying.
- The operation must result in complete cleaning of the equipment.

It is important to emphasize that any pipe, valve, fitting or part not covered by the CIP system must be dismantled and cleaned manually. In slaughterhouses where CIP systems are used it is the responsibility of management to make the technical specifications and approval of this equipment available to the Official Meat Inspection System.

a) Shutter gaskets and seals:
All gasket materials and fittings must not be toxic, porous or absorbent or alterable by food and cleaning compounds. They must be perfectly adjusted to prevent protrusion of the materials to the product area or the formation of depressions or ridges.

b) Air-tight devices and connections:
All connections must be made outside the area that comes into contact with the products and if they are adjacent to it, they must have a seal to isolate the device. There must be enough space to allow the device to be removed easily for cleaning and inspection. Devices and connections must be installed and maintained as to prevent loss of lubricant or entry of products into the mechanism.

c) Inner angles:
The inner angles of the equipment must be provided with bending fittings of at least 6 cm., except in places where they need a larger bend to facilitate draining and cleaning.

d) Welded joints:
All welding within the area of contact with the product must be continuous, smooth, uniform and relatively flush with respect to adjacent surfaces.

e) Elimination of cracks, depressions, ridges:
The whole area of contact with the product must be free from hollow areas, crevices and cracks, overhanging edges, internal threads and flanges, screws or rivets and closed ends of pipes.

f) Equipment for automatic drain:
Where necessary for proper and clean maintenance, equipment must be equipped with self-draining mechanisms.

g) Screening and filtering
All screens and filters must be easily removable for cleaning and inspection. Screening and filtering devices must be designed so that it is impossible to place them incorrectly. Permanent filters and screens must be of perforated metal. With granulated or dry-crushed products, wire mesh screens of not less than 30 x 30 must be used.

Filter papers must be the single use type. Filter cloths and glass wool must be washed.

h) Pumps, pipes and valves:
Pumps, pipes, conductors, valves and adapters that come into contact with food products, must be 18-18 stainless steel or of an approved plastic.

Pumps and pipes that transport food products must be easily removable for cleaning. They must be constructed so that no dead spaces where products may lodge.

This requirement also applies to the lines used to transport raw fat. It allows the use of non-detachable piping (including the use of black iron) in melted fat transmission lines.

i) Conveyor belts:
All conveyor belts used to transport products must be clean, moisture-resistant, of a non-absorbent material and with the driver mechanism unexposed. Conveyor guides, splash guards and others, must be easily removable or of open construction to allow cleaning.

j) Lubricants:
Care must be taken that lubricants do not contaminate the products. As a further precaution against the intrusion of toxic compounds in the product, all lubricants used in this area or other areas where potential contamination may exist must be edible and specifically approved by the Competent Authority.

If there is a possibility of product contamination by lubricants, corrective action must be required without delay.

Of particular concern is the possible contamination of lubricants used in aerial motors, gears and similar devices. If you need to place oil catch pans, they must be readily accessible for cleaning and inspection.

**XXIII. OUTSIDE THE PRODUCTION AREA**

The equipment used outside the production area is also important because of the hazard of cross and/or accidental contamination. In many cases, workers alternatively handle products and equipment, which increases the risk. Therefore, many of the above principles in design and construction must also be applicable in this area.

a) On the outer surfaces there must be no open joint lines, depressions or gaps, cracks or inaccessible holes.

b) Horizontal edges and swinging parts are minimized.

c) All outside parts must be round or tubular if possible, to avoid accumulation of waste and allow easy cleaning.

d) All safety guards or gear must be readily removable for cleaning and inspection.

e) Parts that cannot be cleaned (engines, electrical and others) must be tightly sealed to prevent entry of product or water.

**XXIV. EQUIPMENT FOR THE FACILITIES**

Guidelines have been defined for the placement, arrangement and installation of
equipment, in order to ensure a convenient and positive cleaning. These details must require constant attention to maintain adequate and clean circulation of products.

Initial installation of the equipment and any changes during the operation must be carefully studied to avoid potential health problems. Anything that can result in product contamination must be removed.

1. **Space between walls, ceiling and floor:**

Any equipment that is permanently mounted or cannot be moved easily must be installed at an adequate height and sufficiently away from walls and ceilings to allow easy access for cleaning and inspection; otherwise, they must be tightly built-in.

Equipment, ducts or pipes that pass through walls must be sealed or be recessed with enough space to allow inspection, cleaning or maintenance. In cases where the pipes pass through the ceiling in areas of product exposure, pipe sleeves are located on the floor so that the higher surface is at least 5 cm from it.

2. **Devices installed on the wall**

Wall-mounted cabinets and electrical connections (switches, electrical control panels and BX cables) must be placed at least 2.5 cm off equipment or walls, or tightly built-in in them.

3. **Water connections and wastewater control**

Where possible, water outlets must discharge over the highest point reached by liquids in the equipment. Those facilities that require submerged water lines must be equipped with a vacuum regulator valve (described elsewhere in this Manual). To allow drainage without spills, drains must be of adequate size and the lowest point, without inner ring or projections.

All wastewater transport equipment must be installed so that it discharges into the drainage system without spillage on the floor.

The equipment used for handling edible products (deboning tables, sterilizers and all
items used for cleaning products) must be installed so that wastewater from each unit to be discharged through a separate connection within the drainage system.

Without this interruption in draining, the equipment becomes a part of the drainage system of the plant and water backing up can be a dangerous source of product contamination. The part of the equipment drainage system that needs to be independent from the connection is considered a potential contact point with product. Therefore, its construction, maintenance and cleaning must meet the same requirements as the surfaces in direct contact with the product.

Valves in drain lines for such equipment must be easy to clean and must be mounted at the bottom of the equipment.

4. Water on work tables:
All tables or any equipment where there is water on the surface on which work is performed need to have raised edges. The height of these edges depends on the volume of water used and the operations performed. However, the edge must never be less than 2.5 cm.

5. Magnetic traps or metal detectors:
Due to extensive contact of product with metal equipment such as crushers, cutters, feed mixer, shovels and others, the possibility of contamination with metal particles exists. Magnetic traps have been effective in removing iron particles from minced or semi-liquid products. Nevertheless, these traps are useful for removing non-magnetic metals such as stainless steel or aluminum. Therefore, we recommend the use of electronic metal detectors in places such as lines of product to be packed.

It is preferable that the production line stop automatically when the detector is activated. Some systems are installed so that the portion of the product containing the metal contaminant is automatically removed from the production line.

The use of these traps and detection devices must not replace good maintenance and inspection programs designed to prevent contamination by metal.

6. Compressed air line:
compressed air is used in some operations of the plant that can, intentionally or accidentally, come into contact with the product or be incorporated into it. Examples:
operation with knives and scissors powered by compressed air, the mixture of air and water in some washing operations by air, the mixture of air and water in some carcass washing operations. It is important that the air be clean and free of moisture and compressor oil. Therefore, an effective filter must be installed in the air intake so that only filtered air enters the compressor.

The tank that stores air must be equipped with a drain so that oil and moisture can be drained often.

The compressed air pipe between the storage tank and the nozzle must have water traps and oil petcocks installed. The air used must be removed so as to prevent product contamination.

The equipment that brings air into the product, which uses air to transport goods or that somehow allows compressed air to come in direct contact with the product must have a filter placed as close as possible to air intake. This filter must be able to retain particles 50 microns or larger and must be easily removable for replacement or cartridge cleaning.

7. Washing equipment:
There must be a specific and conveniently located area for washing equipment, grills, canisters, trays and other materials. The cleaning area must have adequate lighting and ventilation, be waterproof, and have well-drained floors, waterproof walls and ceiling, warm and cold water and a pump to extract steam.

8. Tables to process guts and tripe:
When the slaughterhouse wishes to save and clean edible offal, it requires a suitable type of table. This type of equipment is also needed in the plants where stomachs and other offal are retained, where surface fat is removed from the guts and entrails, or when viscera is cleaned and classified according to their thickness to use in by-products.

To maintain good cleanliness conditions in this department, all animal offal must have surface fat removed at tables fitted with a funnel with a container underneath. This container has a perforated bottom that connects directly with the sewer system, and water used for cleaning the material is eliminated through it. The table has cold water supply through a butterfly-head sprinkler system. The funnel and container are regular fixtures of this cleaning table.
It is recommended that the table for viscera have a lift, provided that gravity is not used for this purpose. This lift can be operated with air, water, steam or electricity, depending on the desired installation. In specific conditions, adequate water pressure can be used, providing a source of economic and desirable power for this kind of work. These tables must have a width of 1.20 meters and 1.00 meters high, depending on the type of work. The length depends on capacity, but the recommended minimum is 2.40 meters. The equipment must have a table where rumen and reticulum are separated from the rest of the green viscera, a bell for washing, and it must also have water pressure of 120 PSI and equipment drains must be a minimum 20 cm to drain the digestive contents. Omäsum, abomasum and intestines are washed in a different area to that used for belly and bonnet.

Tables to process these viscera must have a border at 10 cm. and drainage connected directly on the floor drain.

9. Sterilizers in the slaughter and dressing line:
At each step of the slaughter process there must be a sterilizer with hot water at 82 ° C. and a drain connected to the floor drainage system; the source of water must have vacuum regulator valve.

XXV. REQUIREMENTS FOR GENERAL PURPOSE EQUIPMENT

1. Hand cleaning and disinfection stations:
Sinks measuring 30 cm X 40 cm X 15 cm minimum shall be installed in convenient locations for use by employees and inspectors. Each cleaning and sanitizing station must have:

a) Hot and cold water through a mixed faucet with the spout 30 cm above the edge of the sink to allow also arm washing.

b) Quality liquid soap and paper towels in adequate towel holders or other device suitable for proper drying.

c) A container for used towels.
Stations for cleaning and disinfecting hands in work rooms and bathrooms are pedal-activated. They must be connected directly to the drainage system.
2. Water Fountains:
There must be water fountains in work rooms and locker rooms. They may also be placed in the washbasins in a way that the flow of water discharges into the washbasin. In this case the spout must be sufficiently high over the washbasin to prevent splashing.

Water fountains are particularly important in meat processing departments because, otherwise, employees must drink any cold water available. This could result in contamination of the product and equipment with water from the mouths and faces of employees.

3. Tables, sprinkler tanks and regeneration (recovery) of the products:
Occasionally the product may contaminate accidentally. If it is practical, wash it with water. In this case the product must be washed individually immediately after the accident.

Separate equipment must be provided for this purpose. A removable support made of perforated metal to prevent the product from reaching the bottom of the tanks must be placed. These product regeneration tanks must be identified to prevent their use for hand washing or cleaning work utensils. In areas such as deboning rooms, the tank must be placed properly to ensure its proper use.

4. Sterilizers:
Sterilizers must be constructed of corrosion resistant metal (preferably stainless steel) and be large enough for complete immersion of knives, axes, saws and other items in hot water (minimum temperature 82 ° C) that must flow continuously to avoid the accumulation of organic matter. Sterilizers must be placed in the cleaning and sanitizing stations in every step of the slaughter and dressing lines and elsewhere as necessary.

Each sterilizer must be complete with a water line (fully equipped) with a vacuum regulating valve if submerged, a steam line (or other heating medium), a drain and facilities to completely empty the receptacle.

Sterilizers, particularly those used in highly polluted areas, must continuously drain during operation to drain (slaughter and dressing line).
Sterilizers must be provided throughout the slaughter and dressing line in an appropriate size to accommodate the working tools of the operator when sterilizing the equipment. When the sterilizer is placed outside the cleaning and disinfection station, the sterilizer must be connected directly to the drainage system.

5. **Flexible pipe connections (hoses):**
Conveniently located adequate flexible pipe connections must be installed in the plant. Avoid using long hoses. When not in use, the hoses are stored on hooks or reels.

6. **Conveyors:**
Many types of conveyors are used to transport products from one department or floor to another. Their construction must allow thorough cleaning and ensure easy access for inspection.

Conveyors of edible products to take them from one department or floor to another: their construction must allow thorough cleaning and ensure easy access for inspection.

Edible product conveyors are, whenever possible, of the concave belt type. They must be removable so that they can be taken apart in segments of adequate size for cleaning. Where conveyors pass through the floors, the opening must be surrounded by a concrete curb or metal edge of at least 30 cm high, in order to prevent drainage water from the floor to enter the conveyor. The part of the conveyor that attaches to the floor flange must be removable. Enclosed conveyors must be removable to allow cleaning and inspection of all parts and surfaces.

Conveyors linking edible and inedible product departments must be sealed with a lid with automatic trap at the end of edible products and vented to the outside. This keeps odors out of the edible product department.

Conveyors used to carry condemned or inedible products through areas of edible products must be constructed and installed so as to prevent leakage and contamination. They must
also have appropriate openings for cleaning and inspection.

7. Cutting and deboning tables:
The tables used in the cutting and deboning tables must be constructed with approved plastic material (Durazan).

8. Carts:
The carts used to transport goods within the plant are preferably stainless steel. If galvanized metal is used, it must be kept in good condition and must be regalvanized every time it is necessary.

Carts must not have cracks or uneven joints. Metal wheels must be avoided because they damage floor surfaces.

A sign must be placed on all carts. The sign can be easily placed by making two holes at a distance of approximately 2.5 cms. on the rim of the cart and passing a cord or wire through them.

Carts must be cleaned on a daily basis. If one is not empty at the time when cleaning is done, it may not be used again until it is cleaned. They must be fully cleaned, including the bottom.

9. Work equipment for the slaughter and dressing line operator

- Chain to hold the knife sheaths to the belt of the operator
- Knife sheaths
- Knife sharpener
- Plastic handle knives

These tools must be stainless steel or of another wear and corrosion resistant material.
10. Inspection tables

Table surfaces must be stainless steel. Trays must be at least 60x75x7.5 cms. with 5 cm. diameter perforations in the center. The frame or structure must be made of high quality hot bath galvanized iron equipment with a sterilizer and 82°C hot water. The height of the table to the edge of the trays must be between 90 cms. and 1 meter.

Veterinary inspection tables must be placed in each area when the average volume of cattle slaughtering justifies its installation and also to ensure adequate inspection.

11. Holders for the inspection of heads (Hooks for head inspection) must be made of stainless steel with removable and individual hooks for each head, of an acceptable design used in industry. The heads must have no contact with each other and the hooks must be for a minimum of 5 heads per side. Large slaughter and dressing rooms must have adequate inspection head hooks to accommodate the three-fourths of the hourly capacity.

12. Carts for offal inspection and transportation:
Carts must be made of stainless steel. The top tray is for red viscera (lungs, heart, kidneys, spleen and liver) and must be a minimum size of 60 x 60 and be 70 cm. high. The pan must not extend over the lower portion of the cart or impede inspections. The area of the lower compartment for green viscera (rumen, reticulum, omasum, abomasum small intestine, large intestine and rectum) must be approximately 81 square centimeters.

13. Cages for carcasses and packaged meat retained by the Official Meat Inspection System (SOIC)
The slaughterhouse must have adequate equipment in cold rooms for carcasses and in the packed meat freezers for the retention of those products that need to be freeze-treated to make them safe and suitable for human consumption. The equipment must be locked and the key held by the Official Veterinarian in Charge, or by the Circuit Official Veterinarian.

14. Equipment for washing red viscera:
The surface of each tray must have holes to allow water used for washing these viscera to drain.
There must be a pipe for the removal of these liquids connected to a floor drain. There must be at least three trays with 5 cm high edges in each.

XXVI. REQUIREMENTS AND SPECIAL SANITATION PROBLEMS

1. The slaughterhouse must provide facilities for ante-mortem examination. This includes the installation of a platform that runs along all the pens, or an appropriate platform for the veterinarian in charge to perform that activity.

2. The slaughter and dressing room must have a suitable for hygienic performance of operations and efficient inspection.

The raceways through which beef is transported from the slaughter and dressing room to other settings must be located so that carts must not go under rails with already prepared carcasses.

3. The rate of slaughter and dressing depends on the capacity of the facility to move carcasses, offal and parts, clean for complete and efficient inspection, without creating overcrowding or other objectionable conditions of any kind.

4. A specific area or space and facilities suitable for the installation of washing equipment for hooks, trolleys, and others must be provided, and a steam exhaust fan must be installed on an outside wall.

5. Oil must be removed from trolleys, hooks, and others before use. Immersion oils must be kept free of floating debris and foreign film to avoid transfer to your equipment.

6. Sheaths, belts with joints and similar devices to temporarily store operator knives, steels, testers must be of rust-resistant metal or another material that will not become altered. They must be of a type that allows for easy cleaning.

7. When carts are used for the inspection of entrails it will be necessary to allocate a separately drained area, approximately 2.10 x 2.40 m, for cleaning and sterilization. These facilities must be located in the place where impounded material is unloaded from carts, or as close as possible.
The cart washing area must have walls of 2.40 m. or more in height if located in a place where splashing may contaminate food products. The floor of this area must have a gradient of 1.25 m per foot toward a drain in the bottom corner.

This same area will require a hose for washing carts, to provide adequate water volume at least at 83°C. Hot water must come from a central source (instead of mixing steam and water at or near the intake hose where it is connected) and a dial thermometer with its sensing element must be located in the hot water line near the hose connection.

8. Mobile inspection tables with trays require a washing device and a suitable sterilizer. The washing chamber must be equipped with a vent to the outside. This pipe must be rust-resistant metal and have a minimum diameter of 25 cm.

The sensitive element of the thermometer is located in the hot water line at the place where it enters the sterilization chamber. The scale that registers the temperature must be clearly visible to the inspector who works beside the table. Trays are sprayed with cold water to remove traces of blood, animal tissues and fluids prior to sterilization. Immediately after sterilization, trays are sprayed with water again to cool them.

9. Brushes with water tank on the handle are not acceptable for washing carcasses and parts.

10. Near the spot where cattle is skinned must be a properly constructed ramp. The ramp must have a stainless metal bell with a door that can be pushed inward, which fits well in a metal frame and closes automatically by gravity. A vent pipe of a minimum diameter of 25 cm. must extend vertically from the hood to a point above the roof. If skin is removed from the department by other means than the ramp, the facilities must be designed so as not to pose health hazards.

11. Inspection of hides in the slaughter and dressing room is not allowed.

XXVII Evisceration:

1. Adequate facilities to preserve organs and edible parts (viscera) in a cold room, or a separate part of a cold room for carcasses with independent drainage must be available.
Such areas must be accessible from the slaughter and dressing department without having to go through a line of cattle or a refrigerator full of carcasses.

2. Since the opportunities for contamination are great and the product is handled at a temperature that favors bacteria growth, it is important that inspectors are alert to any conditions that may adversely affect the fast and clean handling of viscera.

3. Offal must be placed in boxes with removable metal drip trays at the bottom, on carts provided with similar trays. Otherwise they must be transported to the cold room for viscera.

If the viscera are packed in cold rooms, the right elements, including a table and a sink must be available.

4. The table for emptying rumen must be constructed of a stainless metal. The end of the table must protrude above the emptying hopper about 30 cm to avoid soiling the cut and fatty surfaces of the rumen.

The sides of the hopper must extend vertically below the table to at least 1.05 meters converging to an outlet of a minimum diameter of 30 cm. This is necessary for the rapid evacuation of the contents of the rumen without undue contamination.

5. Cattle rumen used in the preparation of edible products must be completely cleaned immediately after emptying its contents. This task must be carried out quickly after its separation from the carcass.

XXVIII. INEDIBLE AND IMPOUNDED PRODUCTS

1. Adequate facilities for handling inedible and impounded material must be available. The non-food departments must be separate and different from those used for edible products. Communication will be only through an archway with a solid door that closes automatically and must completely fill the opening.

2. If there are no facilities provided, impounded material must be denatured and stored in airtight metal containers in adequate rooms, which will be removed daily. The permit to transport such material through the streets and highways must be obtained from AIA.
3. Pipes, chutes, and conveyors used to transport material must be effectively covered and ventilated to prevent odors.

4. Carts or containers used for collection and handling of inedible or impounded products must be metallic, airtight and constructed to be easily cleaned. Such carts or containers must be marked according to existing regulations, and never to be used for edible products. Containers for inedible products must be properly cleaned before being allowed entry in edible product departments.

5. Tanks, fertilizer driers and other equipment used in the preparation of inedible products must be properly equipped with condensers and other devices that reasonably remove odors produced by such activities.

6. The food processing facilities for animals from certain products must provide facilities to prepare, de-characterize, denature or, cool and pack the material, separate and away from areas for the preparation of edible products. The material must be denatured or de-characterized quickly as part of the preparation process of carcass and viscera separation to avoid the need for supplementary supervision by inspectors.

   a. Once placed in airtight containers properly marked, inedible material may be stored in the cold room for food products, provided it is placed separately, and that it does not interfere with the handling of edible products.

XXIX. PROCESSING

A. Meat preparation and processing departments must be large enough to allow installation of all equipment, with ample space for the operation of the slaughterhouse and the movement of carts.

B. For tasks to develop more efficiently departments must be arranged so as to ensure proper product flow without bottlenecks or unnecessary turns, from the moment raw materials and supplies are received until the final product is shipped from the plant.

C. Facilities must be available to preserve perishable goods under refrigeration. To ensure proper care, and to facilitate the control of mold and bacteria, operations such as meat
cutting, and deboning, must be carried out in departments that have a temperature not exceeding 10 ° C. = 50 ° F.

Such operations must be performed in separate chambers from those containing carcasses or products, to avoid contamination from cleaning water or condensation.

D. Adequate space or a separate area with drainage must be provided for washing carts, boxes, trays, and removable parts of the equipment.

XXX. COOLING, DEBONING AND CUTTING

A. Cooling rails must be located a minimum 60 cm. from refrigeration equipment, walls, pillars and other fixed parts of the building. To ensure product cleanliness and to protect walls from damage caused by carcasses, it is desirable to place the rails (especially main rails or traffic rails) at least 90 cm from the walls.

B. Sign holders for identification numbers in the slaughter and dressing room must be removed once they are no longer in use.

C. Cutting boards must be as small as needed. They must be of a smooth surface and must be removed daily for cleaning. For more details see the section of this manual that discusses equipment.

D. Means to clean and sterilize chest and carcass cutters every time they are used must be available. This is usually done in an appropriate sterilizer.

XXXI. CATTLE PREPARATION

The purpose of this chapter is to present the cattle slaughtering and dressing process in order to familiarize operators with the steps to be followed, which are necessary for the design and construction of facilities and equipment in order to have better perception for the distribution of facilities and equipment spaces. Below is a list of the areas that a slaughter and dressing facility must have and the direct relationship that they have with those operations.

1. Gate that leads directly to the slaughter chamber.
2. Door for injured animals
3. Slaughter chamber
4. Relief or vomiting area must be surrounded by a thick pipe and a gate to make way for animals to the bleeding and beheading area
5. Bleeding and beheading area
6. Skinning area that also includes the separation of the penis, testes, mammary gland, occlusion and separation of the rectum and urethra to the full elimination of the skin before the machine removes the hide
7. Area to cut the breastbone and to facilitate evisceration
8. Evisceration area
9. Carcass sawing area
10. Carcass inspection area
11. Carcass retention area
12. Carcass cleaning area
13. Carcass washing area
15. Carcass weighing, identification and approved stamping area
16. Cold rooms for carcasses
17. Other areas:
   17.1. To clean the head
   17.2. For washing the head
   17.3. For inspection of the head
   17.4. For head retention
   17.5. For washing red viscera
   17.6. For washing entrail inspection carts
   17.7. To place containers for products impounded upon inspection
   17.8. Area for temporary storage of red viscera after washing.
18. Specific areas to:
   18.1. Clean pulleys and controls
   18.2. Belly and bonnet cleaning.
   18.3. Cleaning of omasum, abomasum and intestines
   18.4. Horn deposits
   18.5. Ear and tail plume deposit
   18.6. Fat deposit
   18.7. Inedible products deposit
   18.8. Temporary storage of impounded products
   18.9. Hide deposit
18.10. Blood collectors

Before bringing animals to the slaughter room, they must go through a curtain of water and a dark funnel (net) to prevent entry of flying insects.

XXXII. STUNNING AND BLEEDING

The methods for handling, stunning, holding and bleeding of animals must ensure a clean and humane practice. Isolation pens and ramps will be kept reasonably clean and overcrowding must be avoided, since animals can slip, fall or get hurt by being trampled by others.

Slaughter traps, cattle holding pens and adjacent ramps must be cleaned thoroughly before starting operations each day.

Cattle must be showered and dried properly to avoid leakage at the time of stunning. The pen where stunned animals are unloaded must be as clean and dry as possible. Animals must not bleed into this area, if that happens, the area is washed and dried between each animal.

It is desirable for bleeding to be done as soon as practicable after stunning so that the animal's heart activity can be used for a more complete bleeding. For this reason, and to avoid unnecessary cross-contamination between animals not too many cows must be stunned at one time.

A fence of approximately 1.20 meters high and constructed of corrosion-resistant metal must enclose the handling pen to prevent animals from escaping if they were improperly stunned, which could cause considerable contamination are in the process of preparing meat.

When the hammer of stun guns is fired on the frontal region, pieces of skin, hair and bones can penetrate the brain. If used at the base of the skull, bleeding may occur. Los tejidos hemorrágicos y los cerebros contaminados deben ser decomisados. Contaminated bleeding tissue and brain must be confiscated.

XXXIII. ARTERY SEVERING (REMOVAL OF BLOOD) AND SEPARATION OF THE HEAD
At the moment when the head is severed, the cattle must be separated or placed as to avoid contamination of the head or other areas of the neck. Severed heads must not come into contact with cattle, the ground or other objects. Must be severed as soon as practicable after flaying to reduce exposure to contamination.

The heads must be removed so as to prevent their contamination from gastric regurgitation. This can be done by pushing the head to one side when it is divided. It is extremely difficult to clean up contamination from gastric regurgitation because it is very finely ground. The operator in charge of severing the head must clean and sterilize his knife frequently and after using it with suspect, impounded and obviously sick animals. Before washing, the heads must be free of horns and pieces of hide. The brackets used to position the heads while the horns are removed must be cleaned each time, and sterilized after having been used with suspect, impounded and obviously sick cattle.

Head washing must be done in compartments or areas that stop water splashing. This unit must be made of stainless steel measuring 1.00 x 1.00 meters inside and be high enough (1.75 m). It must have a 10 centimeter diameter special drain on the ground. There must be stainless steel hooks for the heads, a hose to wash the oral cavity, nose, pharynx and larynx, a gun to wash the outside of the head, connected to the water supply. There must also be a sterilizer for disinfecting the pharynx and larynx washing device. Heads must be free of hair and other contaminants prior to inspection.

In the head-washing section, lighting must be not less than 50 foot candles at head level.

Hooks for the heads must be removable or effective means for sterilization must be in place (including a thermometer). Hooks must be cleaned and sterilized between uses after having held heads of suspect, impounded and obviously sick animals.

Inspection head holders must be cleaned and sterilized after being used for an impounded head. When using a system of hooks on a continuous string, the installation must be fitted with a suitable cabinet or other device to clean and sterilize each hook before use.

The minimum sterilization water temperature must be 82 ° C. = 180 ° F. A conveniently located and easy to read thermometer will allow continuous monitoring during operations.
XXXIV. SEPARATION OF THE ESOPHAGUS

When cattle are slaughtered by the overhead rail system, separating the esophagus must be performed at the time the head is separated from the carcass. The esophagus must be closed effectively to prevent leakage of rumen contents. The operation usually involves placing the esophagus around the end rings of a metal rod, pushing through the chest to the diaphragm. This separates the esophagus from the trachea and lungs, allowing for evisceration without tearing. When animals are slaughtered using the cot system, the separation of the esophagus may be deferred until the animal is placed on the cot. The operation is necessary in all situations where gutting involves the removal of the abdominal viscera independently from thoracic viscera. In all cases, the esophagus must be closed, preferably near the area of bleeding to minimize contamination of cattle in the preparation area.

XXXV. SEPARATION OF THE HIDE (SKINNING) AND RELATED OPERATIONS.

After the head is separated from the carcass, and while it is cleaned and inspected, the operator places the animal on the skinning cot (except where this procedure is not used). Care must be taken that the area is acceptably clean before lowering the cow. To avoid contamination of the neck, scalp of the head can be left attached. When the establishment can demonstrate an ability to hang carcasses without the neck in contact with the floor, this is not necessary.

Before making any other incision in the animal, front and rear limbs must be separated.

Upon severing the forelegs, care must be taken to expose the least amount of shoulder tissue, leaving hide attached to cover up to the carpal joint where the cut is made to separate the legs. It may also be a simple cross incision through hide and joint.

Except for incisions to start skinning the neck and legs, cuts through the skin must be made with the blade pointing towards the side of the hair to prevent contamination of meat with cut hair.

Cows must be sufficiently separated from one another to avoid contamination of flayed parts with skin or hair.
Removing lactating udders must be done in a way that prevents contamination of beef, walls, floors or equipment. If contamination of the meat with milk from the udder occurs, the area tissue must be cut immediately.

As skinning operations are carried out, care must be taken that the hide does not come into contact with meat. Each area will be skinned enough to allow the hide to roll back before moving to another area. The preparation process begins in the rails on the hind legs with a downward direction, while in cot systems operations begin at the midline and continue down.

When using the rail method, skinning of the bottom must not begin until after skinning the hindquarters.

When operators remove the animal from the cot they must take care that the exposed meat is protected from contact with the ground or other objects. The floor of this area must be kept clean. It is generally sufficient to use a mop, unless there is pus or other fluids. When washing is necessary, avoid splashing that may contaminate the products that are nearby.

Of all the activities for the preparation of cattle, enucleation of the anus is the final part of hindquarter skinning. Perineal skin must be retracted laterally over the anus, leaving the external sphincter intact.

Before evisceration, the rectum and the bladder neck must be tied in a sufficiently secure manner to prevent loss of urine or fecal material.

The tail is skinned without contaminating the meat. Because this part of cattle is usually heavily contaminated with urine and manure, tools and hands must be washed frequently. This is particularly important when the same operator performs other tasks involving contact with cattle.

After opening the skin of the tail, the tail end is fastened with a clamp and skinning is done manually. The clamp must be cleaned and sterilized between each use, otherwise portion of the tail in contact with it be discarded.
In some skinning rail systems, the hide of the tail is removed mechanically. Handling must be careful in such cases to avoid contamination.

At some point after removing the skin of the midline of the carcass the chest is opened to facilitate thorax evisceration. This operation is performed while cattle is in the skinning cot; in rail systems you wait until skinning has been completed.

Since there is no way of knowing in advance whether there are abscesses or other pathological conditions in the thoracic cavity, the saw used to open the chest must be sterilized after each use.

In males, blood must not be contaminated with urine when cutting off the penis. In the cot system, this procedure is performed while cattle is half hoisted.

**XXXVI. GUTTING**

1. Before opening the abdominal cavity, any contaminants that may be present in the midline must be removed by cutting the section. In females, the uterus is the first abdominal organ to be removed and attention must be given to cattle or entrails with pathological exudates.

2. After you have provided an opportunity for inspection, the uterus and its contents will be placed in sealed containers and removed from the area in carts. There are different methods for the management of the urinary bladder, but whatever the procedure used, it must avoid splashing urine on meat and guts.

3. Gutting is a critical phase of the preparation operation. Acceptable hygiene procedures depend on the skilful work with the knife to cut and separate the abdominal viscera from their attachments. Care must be taken to avoid cutting or tearing the digestive system or intestines.

   This major operation leaves no room for carelessness. If there is contamination of the carcass, contaminated tissue must be cut with a knife.

4. At the time of evisceration, knots must be made at the point where the intestine leaves the digestive system and, and at the site where the esophagus joins the digestive system. In each of these points two knots will be made at a distance of
approximately 10 cm. Pressure needs to be made to push the gut contents before knotting so that tissue can then be cut without spilling the matter within.

5. Knots are not necessary if the viscera are not going to be retained to make food products. In this case they must be very carefully extracted.

6. Cattle will be gutted in a clean cart or table; removable trays will be cleaned and sterilized continuously with water at 82 °C.

7. Carts for routine inspection do not require cleaning with water at 82 °C.

8. Viscera inspection carts used routinely do not required cleaning with water at 2°C. unless they become soiled with gut contents or contaminated with pus or the entrails of condemned cow viscera. For example, when a liver is condemned for conditions that do not cause contamination of the trays with pus or other exudates, such as telangiectasia, open abscesses, fasciolasis, and other. In those cases the inspection cart can be washed simply with water after each set of viscera is removed. Carts will be periodically washed with hot water to prevent the accumulation of fat.

9. When some of the following conditions exist, the entrail inspection cart must be thoroughly washed and sanitized with water at 82 °C. in a particular area:

   A. Contamination from digestive system or intestine content.

   B. Contamination with purulent exudates from fasciolatic liver, pus from abscesses of the lungs, liver or other viscera, peritonitis, or pleuritis.

   C. Contamination from entrails of condemned cattle.

Contamination of edible products or equipment must be avoided when washing the viscera inspection cart.

10. When cattle are gutted on a table with removable lid, the operator must wear clean apron and rubber boots. Boots must be white or have some other distinguishing characteristics, and used only on the table and in the adjacent compartment designated to cleaning them.
11. The area to clean the boots must be conveniently located and constructed to prevent splashing on carcasses or viscera. When shoes, apron or knife become contaminated they must be washed with water at 82 °C.

XXXVII. SAWING

1. Before cutting the carcass with the saw, all contaminated tissue must be removed from the midline of the back to prevent the saw from transmitting contamination to other surfaces.

2. When sawing is done on semi-hoisted beef, care must be taken that the neck does not touch the floor. Sawing equipment shall be sterilized after each use with suspect, convicted and obviously infected cattle.

3. Large blood clots and traumatized tissue of the neck must be cut before inspection on the rails.

4. Carcasses are washed with water so as to ensure the total elimination of hair, dirt or other foreign material. Care must be taken to prevent wash water from splashing onto other products.

5. Water for washing must fall from above the carcass in a downward direction, so that contaminants are carried away from clean areas.

6. After washing, half carcasses must receive a bath with antibacterial solution.

XXXVIII. RAMPS FOR CATTLE

Cattle ramps must be of concrete or paved flooring with 30 cm. high borders or curbs to contain water used for washing. Concrete ramp floors must have step-shaped strips to make cattle movement easier. These metal strips must be placed at a 45o to 60o angle and must not extend beyond half the width of the ramp so that water used to wash the ramp may drain through a central channel. Cattle ramps are ideal when installed with sloping walls, the width at the top of the wall (1.80 m above the floor) must be 90 cm. and width at floor level of 60 cm.
XXXIX CATTLE PENS

1. To avoid dust and odors, holding pens to keep the cattle must be located outside the slaughtering department or separated from it by high enough walls, made of an air-tight material.

2. Cattle pens must be paved with a waterproof material (concrete or brick), and gradient to drain. Except for entry points, around the pens will flanges of at least 30 cm. high., made of a waterproof material like concrete, to contain fluids and liquid and fecal material.

3. Hose connections must be provided, that are well located to keep pens clean.

4. Water troughs must be installed above or near the pen floor drains equipped with adequate drainage. and must have a device to keep water clean and fresh always.

5. A reasonable proportion of pens, including the area for suspect cows and the sleeve, must have a roof to protect against outdoor weather conditions.

6. To care for the wellbeing of cattle it is necessary to hold it in pens with a 2.5 meter perimeter per animal.

XL. SLAUGHTER ROOM

This unit must have concrete floors and walls and be equipped with a metal door, or it can be a full metal case; uniform size is 2.40 m. long, 1.80 m. high and 0.85 m. wide. The floor of the trap must not protrude more than 0.40 cm. over the slaughter room floor. The side door of the trap is a sliding door or it has a winch and it rises, turns the gate and animals are thrown in the relief or vomiting area.

3. BLEEDING AND BEHEADING AREA

This is the area where cattle are bled in the rail. It must be at least 1.50 x 2.40 m. and located immediately in front of the slaughter trap, separate from the vomiting area.

4. INJURED ANIMAL DOOR
Whenever possible, the slaughter area design must include an outer door close to the throat slitting area to allow the handling of injured animals by an elevator (lift) from the truck or other conveyance used to reach the bleeding rail. This facility saves time and facilitates the rapid and humane disposal of handicapped animals.

5. TANKS TO COLLECT MATERIAL FROM THE DIGESTIVE SYSTEM AND THE INTESTINES OF CATTLE (Manure collectors)

For slaughterhouses where considerable number of animals are slaughtered daily, a better method is to provide a dung collecting facility where the contents of stomachs and guts is poured, with a pump. Since the cleaning of these guts uses a large amount of water, it can serve as a vehicle for the content of the digestive system and the intestines.

The dung collector must be made of concrete and designed with a funnel-shaped bottom. A 10 HP pump, at least, regulated by a float empties the dung collector periodically. Otherwise, it is possible to wait for solid material to sink to be able to take out fluids only.

The disposal of this effluent must be done in accordance with the drainage system of the slaughterhouse and government regulations in force.

Drains coming from departments for green viscera must be at 40 cms. In diameter and will continue along the route to reach the collection box.

7. CONTROL OF INSECTS AND RODENTS

Insects and rodents can transmit several diseases to man through food. Therefore, their presence in a meat processing plant creates a potential risk to public health. The only way to prevent it is to maintain effective control.

1. **Prevention**: For a good health it is vital to remove and destroy insects and rodents in the slaughterhouse and around it. Care must be taken of two important factors:
   1.1. Prevent multiplication
   1.2. Prevent them from entering the plant.

In almost every case, the owners of neighboring properties and health authorities cooperate in developing a program to control insects and rodents. The administration of the plant must achieve such collaboration.
Any place where there is food, water and cranny is a potential source of harmful insects. The most common sites are the piles of fertilizers, and organic waste. Government regulations do not permit these accumulations in the establishments.

The plant management must seek the cooperation of the Safety Division of the Vice Ministry for Agricultural Health and Regulations of MAGA to eliminate such pests in slaughterhouses.

Buildings and equipment that harbor insects or rodents must be repaired or replaced so as to eliminate the places where they may hide and multiply. Walls, floors and ceilings where rodents have carved tunnels must be replaced with with rodent-proof materials such as concrete or brick. The tunnels can be blocked with 17 size wire mesh or other suitable materials.

The joints of brick and stone walls must be level and smooth, and all cracks, crevices or openings around pipes and others, must be sealed, so as to prevent the entry of cockroaches and other insects.

Floor drain grates must be in good condition and in place to prevent rodents from entering through drain lines.

Changing rooms and dining floor must be equipped and maintained so as to eliminate pest propagation.

Plant management and the inspectors must examine closets regularly to ensure they are clean and free of insects. Do not allow clutter (or the use the closet for more than one person and to save food), since it is difficult to keep them clean and free of cockroaches when they are too full. Workers food must be preferably stored at an appropriate facility for temporary shelter and dining area.

Dry product storage rooms, like cardboard storage rooms must be kept neat and clean. Stored materials must be arranged so that at the time they are removed you can clean the area. Most dry supplies can be placed on racks at least 30 centimeters off the floor to facilitate cleaning of the surfaces beneath the shelves. All openings through which rodents, birds, flies, cockroaches can enter, and others, must be protected with chicken wire.
When despite rigorously trying to keep out insects and rodents they enter the premises, the application of certain eradication methods are allowed. This indicates that preventive measures have not been fully effective and the management and inspectors must determine where they have failed, taking the necessary steps to prevent their recurrence.

2. Control
The following are the permitted methods for controlling insects and rodents by:
2.1. Chemicals.
2.2. Pyrethrum-based or eletrine insecticide spraying.
2.3. Powder Insecticide.
2.4. Rodent bait based on blood thinners such as guerfarine, dicumarol and others.
2.5. Adhesives cardboards.
2.6. Others.

7. LABORATORY
If the slaughterhouse requires a laboratory to control safety of carcasses and meat cuts in order to verify the sanitary conditions of the slaughtering, cooling, boning and packing of meat products, it must have the right equipment for the analysis of fecal contamination-indicator bacteria and other tests necessary to verify that the products processed in the slaughterhouse are safe and suitable for human consumption. (See Regulation of slaughterhouses for cattle).

8. FACILITIES FOR THE WELL-BEING OF THE STAFF
These facilities include dining rooms, showers, benches, toilets and proper hand cleaning and disinfection stations and to maintain proper hygiene.
The well-being and comfort of slaughterhouse operators is very important, but the basic interest of the inspector is to ensure the best personal hygiene by employees and prevent product contamination with human waste. It is essential that the rooms are clean, well lighted, ventilated, neat and free of rodents, insects and odors, as an example for employees and for obvious reasons of health.

1. Changing rooms and closet space:
The staff must have well located changing rooms, separate from toilets and separate for each sex, well lit and ventilated. Air exhaust fans throw the air out and it must be ensured that the airflow moves away from production areas.
Cabinets must be made of metal or other approved material, moveable or built-in.

To be able to clean surfaces beneath movable cabinets, they must have 30 cm. high legs. The top has a gradient to prevent workers from placing clothing or other objects there.

Where necessary there must be an effective power ventilation system.

Cabinets must be designed and constructed so as to prevent the insects from lodging in there. In order to facilitate the sorting and cleaning of the locker rooms, the seats consist of plastic or wooden boards, about 30 cm. wide, mounted in front and under the cabinet doors on an extension of the frame holding.

If seating separate from the cabinets is favored, they are fixed to the floor by a small number of feet of pipe. The width of the aisle between rows of lockers will be at least 2.10 meters attached when fixed seats are installed (1.50 m between rows of seats) and at least 1.80 meters when fixed seats are in the middle of the locker room.

To avoid unpleasant odors and attracting insects, all clothing, footwear of any kind will be stored in cabinets or on high shelves, and always clean.

There will be a suitable quantity of containers for soiled clothes and trash.

At least once a month it will be necessary to inspect the cabinets. Since many operators routinely close their lockers (lockers, bins) with the key, they will know the inspection program to leave them open. It is desirable that a representative of the plant accompany the inspector to record their observations and ensure the safety of the contents of the cabinets.

The cabinet inspection will also verify if their number is right and if they are in need for repair. The representative of the plant will make a list any cabinets needing repair or replacement and will take appropriate action. The date of the inspection, the relevant comments and action taken will be recorded on the appropriate (pre-operation) form.

2. Showers:
Showers will be placed in the locker room (not in the toilets) of the premises where slaughter operations are conducted. Their installation is also recommended in processing plants.

Shower stalls will have a waterproof curb at 20 cm (unless you enter through a single locker room) and sloping floor towards the shower drain. Soap and towels will always be available. Faucets must be maintained in good condition to prevent dripping.

3. Toilets:
It is important to install a sufficient number of toilets in appropriate locations, adjacent to the locker room and in areas of the plant as necessary.

They must be separated from locker rooms and adjacent areas by a solid wall up to the ceiling. They must not communicate with rooms or areas where products are to be processed or handled. Access through a locker room or ventilated hallway is allowed. The toilets and hallways must have automatic doors that completely cover the openings.

Adequate ventilation is essential because of the possibility of unpleasant odors entering from production areas. Toilets and hallways without air conditioning must be mechanically ventilated through an exhaust duct that expels air out.

To replace the removed air, the bottom of the door panel will have a louvered vent (at least 30 x 30), allowing unidirectional air flow in the area. This precaution will prevent entry of foul air in the plant in case of failure of the ventilation system and windows are used to clear the air.

When using air conditioners, there is usually a positive replacement of air into the room, so full doors will be used.

The following table can serve as a basis for determining the required number of toilets needed:

<table>
<thead>
<tr>
<th>SAME SEX PERSONNEL</th>
<th>TOILETS NEEDED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 through 15</td>
<td>1</td>
</tr>
<tr>
<td>16 through 35</td>
<td>2</td>
</tr>
</tbody>
</table>
If compartment type urinals are used, they will be made of concrete or other waterproof material or covered with ceramic tiles and gradients toward the drain. If urinal is attached to the wall, the drains are immediately below the artifacts. Dispensers must be conveniently located to be able to take paper without touching the toilet paper roll.

Toilets must be the object of strict hygiene rules and when they clog they must be immediately put out of order.

No waste basket cans must be placed for toilet paper after it is used. In toilets for females, sanitary napkin containers must be installed. If floors are contaminated with human waste, the whole room must be closed until it is thoroughly cleaned and disinfected.

Inspectors responsible for the toilets and changing rooms of the opposite sex must arrange routine inspection of those areas with plant management. The installation of pedal-activated hand cleaning and disinfection stations in or adjacent to toilets is imperative.

Having an adequate supply of hot and cold water, liquid soap, paper towels and trash containers is essential. Conspicuous signs are posted instructing employees to wash their hands before returning to work.

4. Eating Facilities
Operators cannot eat or drink in areas where products are handled. If the plant has no cafeteria or a nearby place to eat, adequate facilities must be provided: chairs (or stools), a lavatory and a water fountain.

Vending machines for food and beverages must be located in the area specifically designed for food on high shelves and away from walls to facilitate cleaning and prevent insects from becoming lodged there.
The remains of food and beverage containers (cups, wrappers, bottles and cans) will be thrown into baskets placed near the vending machines, and in no case be taken into the production areas.

If there is a cafeteria in the establishment, maintenance must comply with sanitation regulations issued by competent authority.

Slaughterhouse management must see to it that in preparing and handling food, hygiene standards remain high, because the company cafeteria for workers is an example of the attitude and purposes of the administration regarding the quality of food. Operators will hardly adopt more sanitation precautions in product handling than they see in the cafeteria of the establishment.

4.1. Separate facilities for workers with different functions:
Operators working in the slaughterhouse’s convicted or inedible product departments must have separate facilities.

XLI. WAREHOUSE FOR STORAGE OF CHEMICALS

The storage of chemicals used for cleaning and disinfecting surfaces that come into contact with food, food grade lubricants, detergents, toxic substances (pesticides, rodenticides, etc.) and for the maintenance of the plant must be stored to meet with the principles of Good Manufacturing Practices.

XLII. WAREHOUSE TO TEMPORARILY STORE EQUIPMENT, CONTAINERS, BASKETS, AND TRAYS THAT COME INTO CONTACT WITH FOOD

The facility must provide an appropriate facility where the equipment, utensils, Durazan boards, baskets (baskets, boxes) that come into contact with food are stored temporarily.

XLIII. WAREHOUSE FOR TEMPORARY STORAGE OF EQUIPMENT USED IN FLOOR CLEANING

The plant must have a proper central facility that allows the storage of cleaning supplies and equipment (dryers, rakes, loofah and others).
There must be another area to keep this equipment and cleaning tools according to the place where they are used (slaughter and dressing room, boning room and cold rooms, areas for temporary storage of inedible and impounded products and others).

**XLIV. VEHICLES FOR THE TRANSPORT OF MANURE**

The tanker must be airtight and made of a material that is resistant to wear and corrosion, permitting easy loading and unloading of material.

**XLV. RAIL OR TRANSPORT SYSTEM**

1. The rails of the transport system in slaughterhouses are uniform flat iron 3/8 "x 21/2" or ½ "x21 / 2" rounded flat edges. It is recommended that cattle bleeding rails be flat ½ "x3".
   The hangers or hooks must be stainless steel and placed on 3 "to 4" diameter pulleys.

2. **Rail gradient**: For cattle bleeding, ½ "up to a foot.

3. **Bleeding rail height** (top rail to the highest point from the floor). Bleeding rails must be 4.80 meters high. The final gradient of the track must not be less than 4.60 meters.

   Cattle bleeding rails in straight slaughter areas must be 6 to 6.60 meters long. It exceeds the dry fall area by 3 meters; it is generally 3.35 meters. The size of pulleys, hooks and chains to be used must be taken into account to aid in the vertical size calculation.

4. **Skinning rail height (removal of hide)**: 3.30 mts. The usual.
   The bleeding rail must have a ½ per foot gradient and height must be approximately 2.40 meters so that where it joins the skinning rail it is at a height greater than 15 to 20 cm. This allows rapid transfer of the carcasses from the bleeding rail through gravity.

5. **Skinning rail length**: No specific length for skinning rail is suggested.
Bovine bleeding rail facilities in straight slaughter areas is 6 to 6.60 meters. It exceeds 1.50 meters in the relief or vomiting area, 3 meters in the bleeding area and extends from 1.20 to 1.88 meters to finish at the point of passage towards the bridge to the areas where skinning and removal of the legs, penis, testicles, udder, occlusion of the rectum and urethra, leg hide reflection, region and ventral midline work is done. That is, from the end point of the bleeding area to the end of the skinning area requires a minimum distance of 7 meters.

6. **Height of rails for carcasses in cold rooms**: 3.30 m. minimum.
   Rail to dispatch quarter carcasses may use 2.50 m. rails.

7. **Spacing between rails**:
   7.1. Cattle bleeding rails must be separated 2.40 m. at minimum and at least 1.20 meters away from any wall or column.
   7.2. Cattle skinning rails must be separated 1.20 m. and 1.20 to 1.80 m. from the dressing areas. The latter figure is equal to the center of 3 meters from bleeding rails, which is ideal.
   7.3. The rails must be separated from the washing and sorting platforms at least 45 cm. for convenience to flip carcasses.
   7.4. When carcasses with rails are hand carried, a corridor of 1.80 m. between the wall and the first rail or between the rails together to the corridor space.
### MAIN RECOMMENDED DISTANCES

(Rail height is considered from the end of the rail to the highest point of the floor)

<table>
<thead>
<tr>
<th>No.</th>
<th>RAIL DESCRIPTION</th>
<th>VERTICAL DISTANCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Bleeding rail (distance from the rail to the shackles placement area - 48” - 1.22 mts)</td>
<td>16 feet (4.88 m.)</td>
</tr>
<tr>
<td>2.</td>
<td>Preparation rails (length of pulleys – 15 inches – 0.38 m.)</td>
<td>11 feet (3.35 m.)</td>
</tr>
<tr>
<td>3.</td>
<td>Cooling rails (length of pulleys – 15 inches – 0.381 m.)</td>
<td>11 feet (3.35 m.)</td>
</tr>
<tr>
<td>4.</td>
<td>Mobile equipment – Height of conveyor rail, platform, table to inspect viscera, etc.</td>
<td>See figures 1 and 2.</td>
</tr>
</tbody>
</table>

**HORIZONTAL DISTANCES**

<table>
<thead>
<tr>
<th>No.</th>
<th>RAIL DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Shackling pen (Slaughter chamber)</td>
</tr>
<tr>
<td>2.</td>
<td>Border from bleeding area to perforated sheet (no major rail)</td>
</tr>
<tr>
<td>3.</td>
<td>Fall line to half hoisting line (two cots)</td>
</tr>
<tr>
<td>4.</td>
<td>Fall line to half hoisting line (three cots)</td>
</tr>
<tr>
<td>5.</td>
<td>Half hoisting line to main cooling rail (simple rail)</td>
</tr>
<tr>
<td>6.</td>
<td>Half hoisting line to main rail leading to cooling area (double rail)</td>
</tr>
<tr>
<td>7.</td>
<td>Between the main rail and rails to wash cattle, if they are parallel</td>
</tr>
<tr>
<td>8.</td>
<td>Between the middle lines of preparation cots</td>
</tr>
<tr>
<td>9.</td>
<td>Between the main rail and washing rails and walls</td>
</tr>
<tr>
<td>10.</td>
<td>Between the table and the inspection platform preparation rail.</td>
</tr>
<tr>
<td>11.</td>
<td>Area to sterilize viscera inspection carts.</td>
</tr>
</tbody>
</table>
### GENERAL

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12.</td>
<td>Distance between rails and walls, posts and fixed parts.</td>
</tr>
<tr>
<td>13.</td>
<td>Width of doors through which cattle passes on rails</td>
</tr>
<tr>
<td>14.</td>
<td>From rails to the edge of the slaughtering and deboning tables</td>
</tr>
<tr>
<td>15.</td>
<td>Width of the doors through which product carts go through</td>
</tr>
<tr>
<td>16.</td>
<td>Cart corridors - free space</td>
</tr>
<tr>
<td>17.</td>
<td>Main rails for cold rooms or for traffic</td>
</tr>
</tbody>
</table>

### HORIZONTAL DISTANCES

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>12.</td>
<td>2 feet (0.61 m.)</td>
</tr>
<tr>
<td>13.</td>
<td>4 feet 6 inches (1.37 m.)</td>
</tr>
<tr>
<td>14.</td>
<td>7 feet (2.13 m.)</td>
</tr>
<tr>
<td>15.</td>
<td>5 feet (1.52 m.)</td>
</tr>
<tr>
<td>16.</td>
<td>5 feet (1.52 m.)</td>
</tr>
<tr>
<td>17.</td>
<td>3 feet (0.91 m.)</td>
</tr>
</tbody>
</table>

ANNEX

SANITARY AND HYGIENE MANUAL TO DESIGN THE FACILITIES, CONSTRUCTION AND EQUIPMENT OF A CATTLE SLAUGHTERHOUSE

Official Meat Inspection System – SOIC – Vice Ministry of Agricultural and Livestock Sanitation and Regulations – MAGA – Beef Products and Slaughterhouse Department
1400 POUND STEER HOISTED WITH THE PULLEY TOWARDS THE BLEEDING AND BEHEADING RAIL
HAND WASHING AND DISINFECTION

SOAP DISPENSER
HOT WATER PEDAL
COLD WATER PEDAL

Figure 4—Handwashing basin.
RUMEN AND RETICULUM WASHING EQUIPMENT
HEAD WASHING EQUIPMENT

- Dimensions: 3'-0" x 3'-0"
- Steamline: 4'-10"
- Hook Sterilizer: 5'-6"
- Drain: 4"
- Drainout: 3'-6"
- Floorline: 3'-6"
- Pitch: 1/2" per foot to drain

Official Meat Inspection System – SOIC – Vice Ministry of Agricultural and Livestock Sanitation and Regulations –MAGA– Beef Products and Slaughterhouse Department
HEAD WASHING EQUIPMENT

CONSTRUCTED OF RUST-RESISTING METAL (STAINLESS STEEL), DIRECTLY CONNECTED TO DRAINAGE SYSTEM THROUGH A DEEP SEAL TRAP. AREA IN WHICH EQUIPMENT IS LOCATED HAS SEPARATE DRAINAGE.

DIMENSIONS OF FLUSHER USED ONLY FOR CALF HEADS MAY BE 2'-0" x 2'-0" IN PLAN.

HOLDER HAS SLOT TO PERMIT INSERTION & REMOVAL OF SWIVEL HOOK.
RUMEN AND RETICULUM WASHING EQUIPMENT
RUMEN AND RETICULUM WASHING EQUIPMENT
METAL PLATFORM

**Figure 13**—Stationary-type metal foot platform.

**CART TO INSPECT ENTRAILS**