TO THE POINT CLASS LECTURES (NO. 3, 4, 5)

MEAT INSPECTION (PARA 404) PART II

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Slaughter House (Abattoir)

It is a place where animals are slaughtered or butchered.

The fundamental principles of hygiene as well as economic considerations demand that the slaughtering of animals for human food consumption be carried out in an establishment specially constructed for the purpose and kept under constant sanitary control. A good slaughter house should have the following provisions;

SITE LOCATION

The first step in planning an abattoir is to ascertain the ultimate daily kill of slaughter of animals and the proposed disposal of by products. All slaughter houses should be constructed away from the human population and if possible near the livestock marker and railway station. The prevailing winds should be given due consideration while selecting the site. The direction of winds should be from human habitation towards the slaughter house to avoid problem of air pollution and bad smell. The slaughter house should be constructed in a low lying are with a proper drainage facility and enough water supply. The slaughter house should have a rail linkage. Electric power should also be available. The slaughter house should be fly proof and should have sufficient roof to prevent birds. It should have enough place and facilities for disposal of waste products and be able to cater the need of handling more than required number of slaughtering animals.

The following buildings must be provided:

1. Lairage

   It consists of animal house and pens, where the animals awaiting slaughter are kept. The following points should be observed while constructing the lairage:

   i. The animal houses should be 100-200 meters away from the slaughtering hall (butchery) building to prevent meat from absorbing objectionable odours.
   ii. The covered accommodation should be adequate and should have enclosed courtyard in front.
   iii. Watering and feeding troughs should be provided.
   iv. The animal houses should have concrete floor for better cleaning and easy disinfection. The floor should have proper slope, which should end in pucca drainment for carrying urine and faeces into a soaking pit.
   v. Shedding must be provided to facilitate rest to the animals.
   vi. Attached stores for keeping grain and fodder be provided.
   vii. A separate room for attendant is also required.

2. Isolation Block

   This important building is actually a mini slaughter room. It consists of small lairage together with slaughter room and hanging room. It should be located near the suspected detention room and also in direct communication with the by-product department. The animals which are diseased or suspected must be lairaged apart from the healthy one. This block must contain a small unit for treating sick animals.

3. Slaughter Hall

   Two systems are recognized universally in abattoirs or slaughter houses and they are:

A. French Room System or Chamber System
B. German Hall System

Prior to entering in any system, there is a separate animal bleeding room where animals are slaughtered and after complete bleeding the body is taken for further process dressing and inspection.

A. French Room System or Chamber System:

In this chamber system, the abattoir is divided into a numbers of separate rooms. This system is better and convenient for the slaughter men (butchers) where they can work easily without any disturbance but they can smuggle or substitute diseased portion of the carcass with more confidence. In this system, the inspection is more difficult and requires great number of technical staff and meat inspectors. Therefore, this system is uneconomical for abattoirs animal can only be practiced where the number of slaughter is small.

B. German Hall System:

The transference of animals after antemortem examination in the lairage to slaughter hall is a matter of no difficulty if the abattoir is well designed. The German hall system consists of a small killing room where the animals are slaughtered and bled in a chamber and then transferred to a big hall where all the flaying and dressing of the carcass including inspection is completed. Every facility like flaying apparatus, hanging pulleys to raise the large carcasses, small tables for dressing small animals, enough water supply, electricity and good drainage system must exist in German hall system. The floor of hall is paved, hard, impervious and non-slippery. The hall should be well ventilated. The prescribed hygiene rules facilitate the work in such big halls. The blood is not allowed to gain access to the gullies and drains and instead it is stored in barrels placed as garbage cans in the hall.

4. Hanging Room

Adjacent to the hall, this place is specified for hanging the carcasses vertically as it has been raised for flaying. The hanging of carcass facilitates its setting and inspection.

5. Cooling Hall (Chilling)

Next to hanging hall, this block is situated consisting of a big hall. The temperature of this hall may be kept and maintained between 30-40 F. The hung carcasses after inspection are transferred to this hall for chilling and setting of carcass. They remain good for about a fornight without deterioration. Cooling increases the tenderness of the meat.

6. Guttery or Tripery

This is a separate unit of the slaughter house and consists of engine room, gut scrapping room, tripe room, stores and by-product plant unit. This is close to the slaughter hall. In abattoirs or large slaughter houses a large number of tripes (intestines) are cleared. Tables are provided for each work and the garbage is stored in garbage cans in shape of stomach and intestinal ingesta. This place should be well ventilated. Sufficient water and drainage facilities are provided. The gut cleaning is carried on smooth toped tables. At the end of the table, water tanks for immersion of guts should be provided. The blood should be collected in separate barrels specially provided for this.

7. Hides and Skin Store

   This store should have a sufficient space and size and be capable of storing three or four days material. Proper sanitation be carried and cleanliness be observed daily.

8. Condemnation Cell

   This is a room where condemned carcasses or portions / organs can be stored. It should be near incinerator of the slaughter house and also a facility of steam digester is provided. The key for this room must always be kept under the custody of the incharge slaughter and always be kept under lock and key.

9. Incinerator

   This facility is an essential one for even large or small slaughter houses. The condemned carcasses are treated and useful material is obtained. The rest of the material is burnt to ashes for sanitary disposal of carcasses.

10. Laboratory

    A good small laboratory is provided in such establishment which can cater(provide) the need of diagnosing the suspected meat through carrying various tests and pathological examination to complete the investigations.

11. Bath Rooms and Canteen Shop

    The toilets and bath rooms are provided in the establishment for the workers. Canteen for refreshment is another facility deemed (think / believe) to be necessary for slaughter houses.

12. Offices

    This building is provided near the exit of the slaughter house where offices of chief meat inspector and other technical staff officers are located. This building should be close to the laboratory and have all the facilities of an office.

SLAUGHTER HOUSE SANITATION

In a good abattoir, hygiene will go a long way in the production of clean and wholesome meat. Without a proper sanitation even the most modern and ideal slaughter house will turn into a filth house and will become a public health hazard. Haphazards measures will always fail to meat the sanitation requirements. To ensure proper sanitation, a system of cleaning should be laid down and rigidly followed. Slaughter house hygiene can be divided into the following:

a. Personal hygiene:

   All persons working in the slaughter house handling meat should be regularly examined for any evidence of contagious disease and they should be protected against cholera, small pox, and typhoid etc. They should not have long nails or hairs and their hands should be free from boils, infected sores, cuts and skin diseases. The workers must be free from tuberculosis. They must wash hands with soap before handling meat and must wear clean clothes or working dress.

b. Equipments:

Proper equipment should be provided and sterilized before bringing them to use.

c. Good ventilation:
   Drainage and lighting etc. arrangement be provided.
d. Fly proofing:
   The slaughtering and hanging halls must be perfectly roofed. Special care to avoid rodents presence in the slaughter house will enhance sanitation and efficiency of the slaughter house.
e. Cleaning and disinfectant:
   The slaughter house should be cleaned in a routine system under which daily and weekly routines be made. The equipment, tables, walls and floors must be thoroughly cleaned and disinfected to avoid any contamination of meat.

Contamination of Slaughter House

1. In Pakistan, the greatest health hazard is contamination and not the diseases of animals in meat industry. Hence animal diseases do not pose a serious threat to health but on the other hand the contamination of meat is of common and wide spread that hardly any carcass can be without any contamination or polluted. Very little attention is paid in elementary cleanliness, repair and maintenance of slaughter houses or to the principles of hygiene. The sanitary fittings, sterilization of instruments, disposal of offals and enough supply of water are generally ignored.
2. Meat being a nourishing food for human as well as for microbes which in a matter of few hours render it unwholesome. The temperature and moisture conditions of the country are most suitable for the growth of bacteria and their multiplication which soon convert the meat into deadly poisonous.
3. Initial bacterial load determines the durability or keeping quality of meat. Cleaner the meat, he more durable it is.
4. The meat once contaminated can not be rendered clean. The only way to get rid of contamination is to cut and throw away the contaminated part.
5. Contamination can not be safeguarded through cooking as it has no effect on thermostable bacteria and their toxins.
6. The spoilage of meat can be retarded by production of clean meat and protecting it from contamination till it is consumed.
7. The contamination can be seized by avoiding moisture of meat and cooling it which will render the meat dry. The dry film produce on meat surface acts as a barrier against deeper contamination.

Sources of Contamination

1. Dirty hands, nails, boils, cuts on skin and dirty clothing are the source of contamination. Inflation of carcass by diseased person is yet another source of contamination.
2. Faulty techniques: Do not legate the food pipe (intestine) before starting skinning of the animal. Skinning with the help of dirty feet, holding knife in mouth, using unsterilized equipment, puncturing urinary bladder, stomach or intestine, washing the carcass with dirty water and skinning on ground also induce contamination.
3. Faulty conveyance: The meat should not be carried from slaughter house to market in bath tubs and buckets in an open cart. The contamination from dust in the way must be avoided.

4. Flies: These are major health hazards and common source of meat contamination. Prevent the access of flies to meat at all stages of its processing, storage, transportation and on sale points.
5. Animals: The contamination from animal organs, secretions and discharges should be avoided.
6. Pathological agents: Specific bacteria, viruses, parasites, molds and fungi are main source of contamination.
7. Poor management in slaughter house by not making arrangement of good hygiene provisions and not following the approved procedures of slaughter.

Blood as a Source of Contamination

1. Immune system of body collapses resulting in the death of the antibodies. Different type of spores by microorganisms come out and starts putrifying the blood.
2. Waste products in the blood (brown liquid) is contained by plasma which is normally carried to the kidneys for excretion. After slaughtering, these toxins remains in the blood.
3. Bacteria multiply in stunning animals and poisonous substances are produced which are injurious for human health.
4. Toxoplasma toxins may damage CNS of man. Toxins of staphylococcus and *Cl.botulinum* are not destroyed by cooking.
5. T.B., anthrax, mad cow disease found in these animals and transmitted to man.
6. E.coli not virulent in cattle but dangerous in man.

SLAUGHTERING METHODS

Essentials of Slaughtering:

- The death of the animal brought suddenly in order to avoid unnecessary pain. This method should be as human as possible.
- The bleeding should be complete because complete bleeding increase the keeping quality of meat. The total blood in the body is 8% of its total body weight.
- The flesh of animals incompletely bled is dark in colour.
- Exhausted animals do not completely bleed well while slaughtering.
- It is undesirable that animals awaiting slaughter should view the slaughtering process.

Slaughtering Methods:

Following are slaughtering methods practiced all over the world:-

i) Ritual Method

ii) Jewish Method
It is also called “Kosher”.
Advantages: (a) Proper bleeding takes place (b) Easy to perform
Disadvantage: (a) Delayed unconsciousness due to transverse cut of carotid artery.

iii) Decapitation / Choping of head / Jhatka
Disadvantage:- (a) It s painful (b) Complete bleeding does not take place (c) It is not an humane method.

iv) Islamic Method

ISLAMIC METHOD

This is a religious method and practised in all Muslim countries of the world.

Guidelines:

(a) Animal must be healthy.
(b) Animal must be relaxed to remove all the tensions prior to the slaughtering.
(c) It can be complete by animal has take plenty of food and water.
(d) Razor / Knife must be sharp.

Procedure:

In this method, the animal is casted, its neck is slashed transversely at the throat with a razor sharp knife and the main vessels (common carotid artery) of the neck is severed while reciting "Takbeer". This method is called "Halal". All other methods of slaughter render the meat "Haram" because of not reciting Takbeer.

Advantages:

(i) It is ordered by Allah Almighty.
(ii) It is question of faith and religion.
(iii) It is humane and almost painless to the animal, if the knife is sharp. The cutting of blood vessels (carotid) causes acute blood loss --> CSF pressure fall down rapidly and result into instantaneous anemia of brain and the animal is rendered incapable of feeling any pain or discomfort.
(iv) Depriving brain with main source of oxygen results into development of anorexia and ultimately there is immediately loss of consciousness.
(v) In this method neither medulla oblongata is severed nor damaged by breaking or twisting neck. The heart keeps on working till the last available ounce of blood.
(vi) Complete bleeding is achieved which increase the keeping quality of meat.
(vii) No back bleeding takes place.

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