

## ❖ Pollution Control Implementation Division - III

### SANITATION IN SLAUGHTER HOUSE

#### INTRODUCTION

There are more than 3600 authorised slaughter houses in the country. Most of them are operated and maintained by the country. Most of them are operated and maintained by municipal bodies. A large number of these slaughter houses maintain poor standards of hygiene and sanitation. It is therefore, necessary to either modernise existing slaughter houses or construct new ones. This will assist in producing safe and wholesome meat and utilisation of animal by-products besides reducing environmental pollution and cruelty to animal.

In the note guidelines are suggested to help improving existing slaughter houses and setting up of new slaughter houses on modern lines with emphasis on greater utilisation of wastes.

#### TERMINOLOGY

Carcass -	The part of animal body that is used for meat.
Composting-	A controlled process involving microbial degradation
Dissolve Air Floatation -	Separation of low density contaminant from water using minute air bubbles attached to individual particles to increase the buoyancy of the particle
Evisceration -	The process of removing inner organs of the body, particularly organs of thorax and abdomen such as the intestine, heart, lung, liver, kidneys, etc.
Hygiene -	The science of health and its preservation.
Incineration -	It is a controlled combustion process in which the waste is burnt and converted into gases and a residual containing little or no combustible material.
Lairage -	Facility of slaughter house where animals are delivered and rested prior to slaughtering.
Lard -	Processed pig fat, processing is done by boiling raw fat material.
Offal -	Part of the animal that remains after the carcasses have been removed.
Rendering -	Facility for processing by-product from slaughter house and meat processing units into animal feed, bone meal etc.
Rumen -	the first stomach of ruminants like cow, buffalo, and goat sheep which ruminates.
Slaughter House -	The building, premises or place which is used for slaughtering of

animals/birds for human consumption.

Viscera - The organ of the great cavity of the body which are removed after slaughtering.

## LOCATION

The slaughter houses should be located outside or on the periphery of a city or town and shall be away from an airport. Care should, however, be taken to see that these are easily accessible to the patrons and do not adversely affect the transport of meat to the market place. Main service such as portable water, electricity and proper hygienic waste disposal facilities are a prerequisite and should be taken care of.

## BASIC AMENITIES

i) The slaughter house shall have the following essential facilities:

- (a) Reception area for animals:
- (b) Lairage:
- (c) Facilities for ante-mortem inspection
- (d) Segregation ward for sick/diseased animal:
- (e) Carrying out humane slaughtering:
- (f) Flaying, dressing and washing of carcasses:
- (g) Handling carcasses and edible offal:
- (h) Handling by-product:
- (i) Inspection of meat and disposal of unfit meat for human consumption:
- (j) refrigerated room: and
- (k) Laboratory

(ii) The floor of slaughter hall and dressing area of slaughter house must be impervious, of good quality marbled slab/cement - tiles or good quality cement concreting with paper gradient for draining wastewater. Walls up to 1.5 to 2 meters from floor should be surfaced with approved quality white glazed tiles or other equivalent material. Suitable type of ventilation system like air conditioning, air circulators, exhaust fans etc. should be provided.

(iii) The slaughter house should have an adequate separation between clean and dirty sections which shall be arranged in such a way that from introduction of a live animal into the slaughter house up to the emergence of meat and offal classed as fit for human consumption there shall be a continuous the live animals and meat and by-products or waste.

(iv) There should be rails with hooks of suitable rust proof metal for bleeding, dressing and hanging of carcasses in slaughter hose.

## OPERATIONS

**(i)Slaughtering** : Arrangement should be provided in slaughter house for humane slaughtering. Large animals may be stunned mechanically by captive pistol or gun. In case of goat, sheep and pig, electric stunner may be used. An animal should not be stunned and slaughtered in sight of other animals.

**(ii)Bleeding** : The bleeding area should be so located that the blood should not be spashed on other animals being slaughtered or on carcasses being skinned. Blood drains and collection should be immediate and paper.

**(iii) Dressing** : Dressing of carcasses should not be done on floor. Adequate means and tools for dehiding or belting of the animal should be provided. Hides and skins should be immediately transported either in a closed wheel barrow or by chute provided with self closing door. In no case, the hides or skins should be spread on floor for inspection. Means for immediate disposal of legs, horns, hooves etc. should be provided through spring load floor chutes or side wall door or closed wheel barrows.

**(iv) Evisceration** : There should be adequate contrivance for immediate separation and disposal of condemned material. Care should be taken to not to puncture intestine during evisceration to avoid contamination of carcass.

#### **WASTE SUPPLY:**

(i) Sufficient, safe, portable and constant supply of fresh water shall be available at adequate pressure through out the premises. There should be arrangement of hot water supply in slaughter hall and work rooms during working hour.

(ii) At all convenient points, sterilising facilities should be provided. Hot water is required at not less than 82°C for frequent sterilising of equipment and tools.

(iii) Suitable facilities for washing of hands (including adequate supply of hot and cold water, nail brushes, soap or detergent) should be provided for persons working in slaughter house.

(iv) Every sanitary convenience in a slaughter house should be supplied with water by means of suitable flushing appliance

#### **MAN POWER:**

The workers engaged in slaughtering, dressing etc. should be well educated and trained in their respective operations. Workers should have medical check up and should be medically fit to handle meat(food). They should be provided with necessary uniform and protective clothing and they should always use and maintain them in a clean and sanitary condition through out their working period.

#### **INPLANT MEASURES**

(i) High efficiency spray nozzles with quick shut off in carcass washing, evisceration line and all cleaning purpose should be installed for effective cleaning and to reduce water consumption.

(ii) Dry cleaning set up for all clean-up operations followed by controlled and efficient wet cleaning should be introduced to reduce pollution load in wastewater.

(iii) Proper segregation and collection of blood should be practised in every slaughter house.

(iv) The dry procedure for collection of stomach and intestinal contents should be adopted. In no case, discharge of stomach and intestinal contents be allowed to discharge into drains.

(v) Hairs/feathers and other screenable solids should be removed from the wastewater as close to the place of generation/discharge as possible.

#### **RECOVERY FROM WASTE**

(i) Blood should be collected by pharmaceutical companies for manufacturing of haemotonic preparations. Alternative, blood plasma could be used in sausage preparations. Blood can also be converted to blood meal which, after mixing and drying with rumen digesta can be used as animal

feed.

(ii) Rumen digesta contains 10-20% proteins, vitamins and essential minerals which, after processing/drying is an ideal animal feed. Alternative, rumen digesta can be used as manure after composting.

(iii) Fat should be collected separately and rendered into tallow or lard by using wet or dry rendering processes. Indirect heat is used to melt fat and evaporate moisture from animal tissue. Tallow and lard is a valuable raw material for several chemical industries.

(iv) Dissolved air floatation (DAF) is a proven method not only for pre-treatment of wastewater but also for fat and protein recovery. Prior to floatation coagulation and flocculation are required. The collected float with solid content of 16-18% consists mainly of protein and fats. Coagulation of proteins and melting of fats is carried out in the subsequent protein recovery system consisting of a heat exchanger and dryer. The dried product with a protein content of approximately 98% can be used as animal feed.

## **WASTE MANAGEMENT**

For implementation of effective waste management system, the slaughter houses have been classified into three categories i.e. large, medium and small. The criterion of classification is specified in Schedule -1

**(i) Effluent :** Wastewater of a slaughter house should be subjected to appropriate treatment system as given in Schedule-II to meet the prescribed standard before it is discharged. The standard notified under the Environment (Protection) Act, 1986 are presented in Schedule III.

Schedule - I  
(Guideline -12)

### **Classification of Slaughter Houses**

<b>S.No.</b>	<b>Category of Slaughter House</b>	<b>Criterion</b>
1.	Large	Annual Slaughtering Capacity: Large Animals > 40,000 and Goats/Sheeps > 6.00,000 or Daily Live Weight Killed > 70 Tonne
2.	Medium	Annual Slaughtering Capacity: Large Animals 10,001 - 40,000 and Goats/Sheeps 10,00,01 - 6.00,000 or Daily Live Weight Killed 15 - 70 Tonne
3.	Small	Annual Slaughtering Capacity: Large Animals > 10,000 and Goats/Sheeps Upto 1,00,000 or Daily Live Weight Killed Upto 5 Tonne

Schedule - II  
(Guideline -12(i))

### **Wastewater Treatment Systems**

S.No.	Category of Slaughter House	Essential Treatment
1.	Large	Self cleaning type screening, anaerobic treatment, aerobic treatment and filter press for dewatering of sludge.
2.	Medium	Two stage screening (bar type), anaerobic pond and polishing pond
3.	Small	Two stage screening (bar type), anaerobic pond and polishing pond

Schedule - III  
(Guideline -12(i))  
**Standards**

S.No.	Category of Slaughter House/Unit	Parameters	Limit not to exceed, mg/l
1.	Large Slaughter Houses (Capacity above 70 TLWK/day)	Bio-chemical Oxygen Demand (BOD <sub>5</sub> ) at 20 °C	100
		Suspended Solids	100
		Oil and Grease	10
2.	Medium and small Slaughter House (Capacity above 70 TLWK/day)	Bio-chemical Oxygen Demand (BOD <sub>5</sub> ) at 20 °C	500
3.	Meat Processing (a) Frozen Meat	Bio-chemical Oxygen Demand (BOD <sub>5</sub> ) at 20 °C	30
		Suspended Solids	50
		Oil and Grease	10
	(b) Raw Meat From Own Slaughter House	Bio-chemical Oxygen Demand (BOD <sub>5</sub> ) at 20 °C	30
		Suspended Solids	50
		Oil and Grease	10
	(c) Raw Meat From other Slaughter House	-	Disposal via Screen and Septic Tank
4.	Sea-Food Industry	Bio-chemical Oxygen	

		Demand (BOD <sub>5</sub> ) at 20 °C	30
		Suspended Solids	50
		Oil and Grease	10

**Note :** (i) TLWK - Tonne of live weight killed

(ii) In case of disposal into municipal sewer where sewage is treated, the industries shall install screen and oil and grease separation units.

(iii) The industrial having slaughter house along with meat processing units will be considered in meat processing category as far standard are concerned.

Schedule - III

(Guideline -12(i))

**Standards**

S.No.	Type of Waste	Capacity of Slaughter House	Method of Disposal
1.	Water consisting of inedible offals, animal tissue, organs, body parts, carcasses etc.	Large Medium Small	Rendering Rendering or Controlled Incineration Burial
2.	Stomach/intestinal contents, dungs etc.	All Categories	Composting
3.	Sludge from wastewater treatment system	All Categories	Composting