# Guidelines Issued By C.P.C.B.

❖ Pollution Control Implementation Division - III

## SANITATION IN SLAUGHTER HOUSE

### INTRODUCTION

There are more than 3600 authoriesed 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 unitisation 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 gages and a residual containing little or no combustible material. |
| Lairage - | Faciliy of slaughetr house where animals are delivered and resyted perior 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 carcassses 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 separtion and disposal of condemmed material. Cqare should be taken to not to puncture intestine during evisceration to avoid contamination of carcass.

**WASTE SUPPLY:**

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

(ii) At all convenient points, sterlising facilities should be provided. Hot water is required at not less than 820C 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 applian ce

**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 effeciency spray nozzles with quick shot 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**

| S.No. | Category of Slaughter House | Criterion |
|---|---|---|
| 1. | Large | Annual Slaughtering Capacity:<br>Large Animals > 40,000 and<br>Goats/Sheeps > 6.00,000<br>or<br>Daily Live Weight Killed > 70 Tonne |
| 2. | Medium | Annual Slaughtering Capacity:<br>Large Animals 10,001 - 40,000 and<br>Goats/Sheeps 10,00,01 - 6.00,000<br>or<br>Daily Live Weight Killed 15 - 70 Tonne |
| 3. | Small | Annual Slaughtering Capacity:<br>Large Animals > 10,000 and<br>Goats/Sheeps Upto 1,00,000<br>or<br>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 Slaugter House/Unit | Parameters | Limit not to exceed, mg/l |
|---|---|---|---|
| 1. | Large Slaughter Houses (Capacity above 70 TLWK/day) | Bio-chemical Oxygen Demand ($BOD_5$ ) at 20 °C<br>Suspended Solids<br>Oil and Grease | 100<br>100<br>10 |
| 2. | Medium and small Slaughter House (Capacity above 70 TLWK/day) | Bio-chemical Oxygen Demand ($BOD_5$ ) at 20 °C | 500 |
| 3. | Meat Processing<br>(a) Frozen Meat | Bio-chemical Oxygen Demand ($BOD_5$ ) at 20 °C<br>Suspended Solids<br>Oil and Grease | 30<br>50<br>10 |
| | (b) Raw Meat From Own Slaughter House | Bio-chemical Oxygen Demand ($BOD_5$ ) at 20 °C<br>Suspended Solids<br>Oil and Grease | 30<br>50<br>10 |
| | (c) Raw Meat From other Slaughter House | - | Disposal via Screen and Septic Tank |
| | | | |
| 4. | Sea-Food Industry | Bio-chemical Oxygen | |

| | | | |
|---|---|---|---|
| | | Demand ($BOD_5$ ) 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, aniaml tissue, organs, body parts, carcasses etc. | Large | Rendering |
| | | Medium | Rendering or Controlled Incineration |
| | | Small | Burial |
| 2. | Stomach/intestinal contents, dungs etc. | All Categories | Composting |
| 3. | Sludge from wastewater treatment system | All Categories | Composting |

| Sr. No. | Industry | Parameter | Standards |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| | Glass Industries (for all categories) | **EFFLUENTS:** | |
| | | pH | 6.5 – 8.5 |
| | | Total Suspended Solids | 100 mg/l |
| | | Oil & Grease | 10 mg/l |
| 49. | **LIME KILN** | Stack Height | |
| | Capacity : | | |
| | Upto 5 T/day | Stack Height | A hood should be provided with a stack of 30 meter height from ground level (including kiln height). |
| | Above 5T/day | Stack height | $H=14(Q)^{0.3}$ where Q is emission rate of $SO_2$ in kg/hr and H=Stack Height in meters. |
| | More than 5T/day and up to 40 T/Day | Particulate matter | 500 mg/Nm$^3$ |
| | Above 40T/day | Particulate matter | 150 mg/Nm$^3$ |
| 50. | **SLAUGHTER HOUSE, MEAT & SEA FOOD INDUSTRY** | **EFFLUENTS** | Concentration in mg/l |
| | Category | | |
| | A.Slaughter House | | |
| | (a) Above 70 TLWK/day | BOD [1][3 days at 27°C] | 100 |
| | | Suspended Solids | 100 |
| | | Oil and Grease | 10 |
| | (b) 70 TLWK/day below | BOD [1][3 days at 27°C] | 500 |
| | B.Meat Processing | | |
| | (a) Frozen Meat | BOD [1][3 days at 27°C] | 30 |
| | | Suspended Solids | 50 |
| | | Oil & Grease | 10 |
| | (b) Raw Meat from own Slaughter House. | BOD [1][3 days at 27°C] | 30 |
| | | Suspended Solids | 50 |
| | | Oil & Grease | 10 |
| | (c) Raw Meat from other sources | | Disposal via Screen and Septic Tank. |
| | C.Sea Food Industry | BOD [1][3 days at 27°C] | 30 |
| | | Suspended Solids | 50 |
| | | Oil and Grease | 10 |

* The emission standards from Boiler House shall conform to the standards already prescribed under E(P) Act, 1986 vide notification No.G.S.R.742(E), dated 30.8.90.

[1] Substituted by Rule 2 of the Environment (Protection) Amendment Rules, 1996 notified by G.S.R.176(E), dated 2.4.1996 may be read as BOD (3 days at 27°C) wherever BOD 5 days 20°C occurred.

| Sr. No. | Industry | Parameter | Standards | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | |
| 51. | **FOOD AND FRUIT PROCESSING INDUSTRY:** | **EFFLUENTS** | Concentration not to exceed – mg/l except pH | Quantum gm/MT of product |
| | Category | | | |
| | **A. Soft Drinks** | | | |
| | (a) Fruit based/ Synthetic (more than 0.4 MT/Day) bottles and tetrapack | | | |
| | | pH | 6.5 – 8.5 | - |
| | | Suspended Solids | 100 | |
| | | Oil and Grease | 10 | |
| | | BOD[1][3days at 27°C] | 30 | |
| | (b) Synthetic (less than 0.4 MT/Day) | | Disposal via septic Tank | - |
| | **B. Fruit & Vegetables** | | | |
| | (a) Above 0.4 MT/Day | pH | 6.5 – 8.5 | - |
| | | Suspended Solids | 50 | |
| | | Oil and Grease | 10 | |
| | | BOD[1][3days at 27°C] | 30 | |
| | (b) 0.1-0.4 MT/day (10 MT/year) | | Disposal via septic Tank | - |
| | **C. Bakery** | | | |
| | (a) Bread and Bread & Biscuit | | | |
| | (i) Continuous process (More than 20T/day) | pH | 6.5 - 8.5 | - |
| | | BOD[1][3days at 27°C] | 200 | 25 |

**Note :** (i) TLWK – Tonnes of Live Weight Killed (ii) In case of disposal into municipal sewer where sewage is treated the industries shall install screen and oil & grease separation units. (iii) The industries having slaughter house along with meat processing units will be considered in meat processing category as far as standards are concerned.

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