MEAT PROCESSING LABORATORY: GUIDELINES FOR ESTABLISHMENT

VOLUME 1

BY

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INTRODUCTION

This document was compiled in response to a request made by Professor K.A. Haizel in 1988 when he was the then Dean of the School of Agriculture, University of Cape Coast.

My services to the above school as a part-time lecturer in Meat Science in the same year developed a cordial relationship between Professor Haizel and myself.

I therefore found it necessary to prepare this script to enable the establish of a meat processing laboratory for teaching purposes for the Animal Science Department of the School of Agriculture, U.C.C., Cape Coast.

I am hopeful this script will be a useful guideline for the establishment of the meat processing laboratory.

1. Laboratory location and size.

The laboratory must be suitably located for easy and efficient cleaning and waste disposal.The size can be variable depending on the throughput or level of production,but a 10*15 metre laboratory would be adequate to handle the processing of about 5 pig carcasses per day using medium capacity equipment. The space occupied by storage facilities such as fridge, freezers or cold store does not form part of the room above.
The floor of the processing room must be terrazo made or any similar material which will provide a hard, smooth surface for easy cleaning. The walls of the room must be tiled to at least a quarter or half way up with ceramic material.
Wire mesh or mosquito netting must be provided on all windows and doors to prevent entry of flies and other insects.

2. Electricity supply and cleaning facilities.

i. Pipe-borne water must be provided at all times.

ii. Provision of a water hose with a nozzle capable of delivering high pressure spray of water for cleaning purposes. Provision of cleaning brushes and floor mops.

iii. Provision of a hot water system so that both cold and hot water will be available for use at all times.

iv. provision of a suitablely large basin or a sink effectively channeled for easy disposal of effluents from meat processing.

v. Provision of electric power for light and processing equipments. A seperate meter must be provided for heavy duty equipments.

vi. Provision of at least 5 square-type suckets and mounted at working height (about 1 to 1.5metres) from the floor,to provide connections for the various equipments to be used.

vii. Wellington boots must be provided to go with protective clothen and headgear. These are to be worn at all times when working in the processing room. Provision of gloves is very useful and must be available for use.

viii. Hypochlorite solution for cleaning and sterilization of processing equipment and floor after the day's work, must be provided.

3. Laboratory furniture.

i. Provision of a big cupboard (about 5*1.5metres, length by breadth), to store equipment and tools. The top surface of the cupboard can stand various equipment. The surface of the cupboard must be covered with a hard smooth material,eg. formica. The cupboard must also be constructed to the working height.

ii. Provision of butcher's chopping block(about 1*0.8metres, length by breadth). The block can be covered on the top with a thick polytop covering to protect against wood damage of the block during meat chopping.

iii. Provision of carsass trimming table (about 3*1.5metres, length by breadth), also constructed to the working height and with a polytop covering.

iv. Provision of a packaging table about the same size as that in (iii) above.

4. Equipment for comminution processing.

i. Bowl chopper or cutter (medium capacity)

ii. Mincer with an attachment for mixing and accessories (medium size), or separete mincing and mixing units.

iii. Sausage filler (hand or electric operated), with different nozzle accessories.

NB: Alternatively, sausage filler attached with a linking machine.

iv. Sausage casings: Both edible and inedible types.

*** Edible casings are made from animal intestines, such as pigs, sheep etc.

*** Inedible casings are made from cellulosic and other synthetic materials.

v. Burger forming machine (hand or electric operated), with accessories.

5. Sealing and packaging equipment.

i. Tipper-clipper (for end sealing).

ii. Small-size vacuum sealer.

iii. Heat-sealing device.

iv. Packaging films of various gauges for both aerobic and vacuum sealing. The pouches can be made to the required size of the package.

v. Large plastic stacking containers to hold both raw meat and finished products. Provision of wooden shelves also required for the same purpose.

vi. Expandable plastic trays for meat packing, this goes with polyethylene films(eg. shrink wrap films) to wrap the product.

vii. Laboratory trolleys.

viii. Tacking and labelling facilities.

6. Meat cutting and slicing equipment.

i. small-size band saw to handle bone-in joints.

ii. Medium-size slicing machine, for slicing hams, bacon and chilled meats.

iii. Dressing, trimming and boning knives, axe and hand saw.

7. Weighing equipment.

i. Carcass weighing scales, made up of the following: top loader electronic or manual operated scales, capable of weighing between 1 to 100kg,for large weighings, and up to 10kg,for small and accurate weighings.

ii. Meat hooks, made in aluminium or stainless steel.

8. Smoking and cooking equipment.

i. Electric meat cooker and or smoking oven.

NB: Locally constructed meat smoking ovens are also available. Care must however be taken to suitably site the structure in order to avoid smoke pollution to the neighbouring environment.

iii. Ham and meat presses. To form various cured boneless meat joints for cooking.

9. Storage equipment.

i. A cold storage facility capable of providing at least -18C is suitable. A normal freezer will provide this service.

ii. Chill room facility capable of providing at least a temperature range of about (-2C to 4C) will be suitable.
Normal refrigerators will provide this condition.

10. Additives,processing chemicals and tools.

i. Assorted herbs, spices, and seasoning mixes(both local and exotic varieties).

ii. Sodium Nitrite (E250)

iii. Sodium Nitrate (E251)

iv. L-Ascorbic Acid (E300)

v. Polyphosphates

vi. Edible salt (Sodium chloride)

vii. Sugar

viii. 98% Glacial Acetic acid (E260)

ix. Stitch pump(comprising of stitch niddle and barrel.

x. Potassium or sodium sorbate (E202 or E201).

11. Slaughtering and dressing facilities.

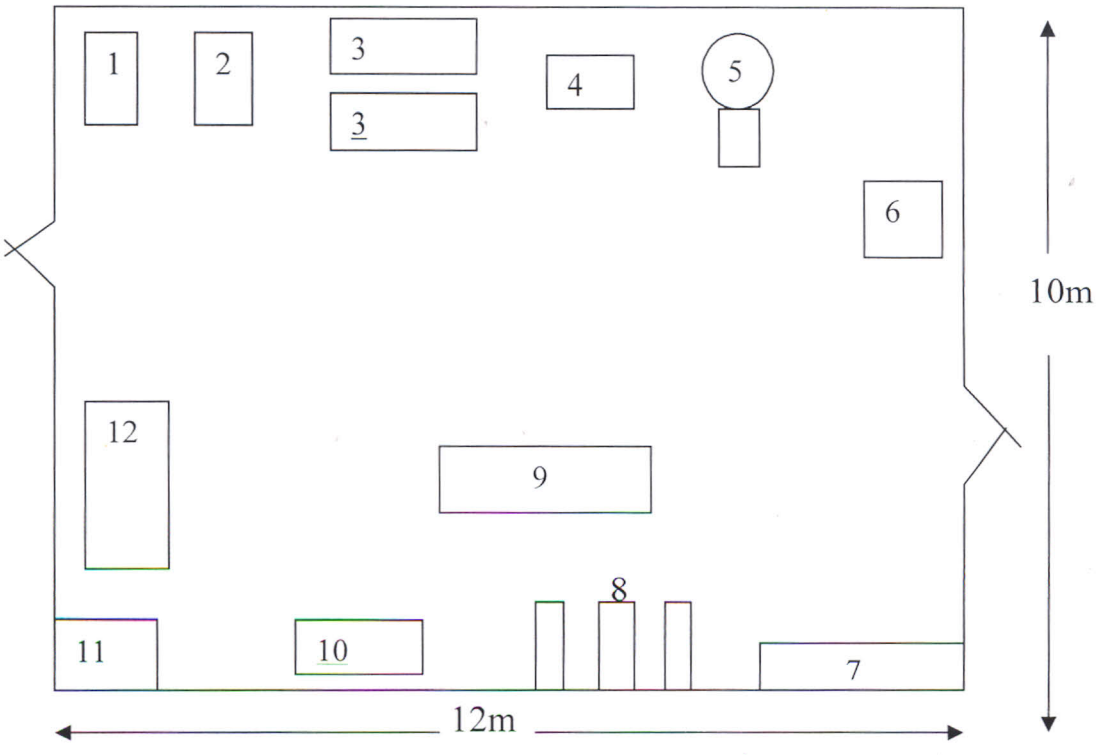
i. Complete butcher's knife set, including boning axe, hand saw and a smooth file for fine sharpening of knives.

ii. Meat hooks as in section 7.

iii. Scalding tank (to contain about 90 litres of water and made from stainless steel,aluminium or thick plastic material).

NOTE: The actual slaughtering of animals must be carried out under the inspection of a meat inspector,ie. to carry out both ante-mortem and post-mortem inspections.
Slaughtering facilities and actual slaughter of animals must not be sited in the same room as for meat processing. There must be adequate seperation of the slaughtering line from the processing and finished product lines.

(D) **PROCESS LAYOUT – MEAT PROCESSING ROOM**



KEY TO LAYOUT

1. Standing freezer
2. Fridge
3. Packaging tables
4. vacuum sealer
5. Sausage filler with burger forming attachment
6. Bowl cutter
7. Chest pf drawers for processing ingredients storage
8. Meat pumping and curing
9. Packaging or cooling shelves
10. Meat cutting and trimming
11. Sink with cold and hot water top facilities
12. Meat preparation/boning