

CHAPTER 4

PRODUCTION AND PROCESSING OF MEAT

There are about 27 integrated modern meat processing plants (Annexure –III) approved for export of meat. These plants are eco-friendly and are world class following the sanitary and phytosanitary (SPS) guidelines given in the Codex Alimentarius for production of Quality safe meat.

These plants have HACCP and ISO:9000 Certification. Many integrated plants have SGS Certification also and follow Good Manufacturing Practices (GMP) and Good Hygienic Practices (GHP). The integrated plants have facilities for holding of animals, lairage, race, knocking box, stunning facilities, abattoir with slaughter line for bleeding, de-hiding, splitting, washing and weighing facilities. The plants have also facilities for chilling, deboning, plate freezing, blast freezing, modern packing and cold storage. The processing plants have bio-security built in the plant where there are two zones, namely, black and white zones.

The plants have modern facilities for byproducts processing, proper and efficient solid waste disposal, effluent treatment, bio-methanation and rendering plants.

PROCESSING

The animals are brought from the disease free zone which is about 100 km area around each export oriented plant where all the disease control programmes are in place and monitored by the State Government Veterinary Department.

The animals are bought by the slaughter house from the local livestock markets with individual animal's identification tags to ensure traceability as to the origin of the animal. The transport of livestock is as per the guidelines given by the SPCA Act of 1960 and BIS Standards of 2007 which take care of animal welfare while being transported. The Veterinary Doctor issues the Animal Health Certificate during the transit of the animal from livestock market to slaughter house.

In the plants, the trucks with live animals are passed through the foot bath with 1% formaldehyde to disinfect the truck tyres from the black zone. The animals have a forward movement in the plant where live animals are passed through to black zone and finished product is packed and dispatched from the white zone. The animals are unloaded at the unloading area and kept for 24 hours in the resting pens where drinking water is made available *ad lib*. Here, ante mortem examination of live animals is conducted by the veterinarians. As per the norm, one veterinarian is assigned to conduct 96 ante mortem examinations per day in a shift of 8 hours / day.

The animals passed by the Veterinarian in ante-mortem inspection are passed through lairage and race where they are washed with water before sending for slaughter.

The animals for slaughter are held in the Knocking Box where they cannot see the animals being slaughtered. First they are stunned either by electric / pneumatic stunner as per the requirement of the importing countries. Some countries do not allow stunning. All the animals are slaughtered by HALAL method in the presence of Holyman assigned by All India Jamiat Ulema-e-Hind as per Islamic *Shariyat*, for certification.

After slaughter, the animals are allowed to completely bleed in the slaughter line, whereafter legs are cut, de-hiding is done and carcass is split into two halves. Here, the Veterinarians conduct the post mortem examination in the abattoir. After it is found fit for human consumption, the carcass is washed, stamped and transferred to chiller. The chiller has a temperature range of 2 - 4°C where carcasses are kept for 24 hours.

When the deboned temperature is achieved at 7°C and pH has gone down below 6, the carcass is brought to deboning hall having room temperature between 12°C–15°C for deboning and preparation of prime cuts.

Various prime cuts are prepared in deboning hall as per the specifications given in Chapter 7, and packed as per the buyer's requirement. The packed cartons are passed through the metal detector to check for external contaminants. Thereafter, the cartons are frozen at -40°C for 10 - 12 hours to bring the deep bone temperature to -18 to -20°C. The cartons can also be frozen in Blast Freezers having a temperature of -40°C. The cartons are labelled about the date of production, shelf life, contents of the product, country of export etc. as per the requirement of the country.

After freezing, cartons are brought to the cold storage. Here, they remain till they are cleared by the in-house laboratory about the safety of the batch after microbial analysis.

The flow diagram of the whole production procedure is given at **Annexure 1**.

QUALITY ASSURANCE

The quality and safety are assured by monitoring the critical control points (CCPs) of HACCP and ISO: 9000 are given in Chapter 5. The in-house laboratory conducts at random the microbial examination of samples of meat, water, air, personal swabs from the worker's hands, etc., so as to keep tabs on the hygienic environment and personal hygiene.

After the clearance from the in-house laboratory, the cartons with frozen meat are loaded in the refrigerated containers having -18°C to -20°C, sealed and transported to the Mumbai / Chennai / Kolkata seaports for onward transmission to the importing countries.

In the production process cold chain is maintained since the carcasses are chilled to the end uses namely, processing plants / individual consumers.

PRODUCTION OF CHILLED CARCASSES (SHEEP AND GOATS)

All the integrated plants have separate line for small ruminants (sheep and goats) where there is an arrangement for holding the animals in the lairage, race, Knocking Box, slaughter area, slaughter line for bleeding, de-hiding, and chilling. Mostly chilled carcasses are split into different cuts, packed in food grade polythene and sent by air to importing countries, mostly in the Gulf region. All food safety norms are implemented by conducting ante-mortem and post-mortem examinations.