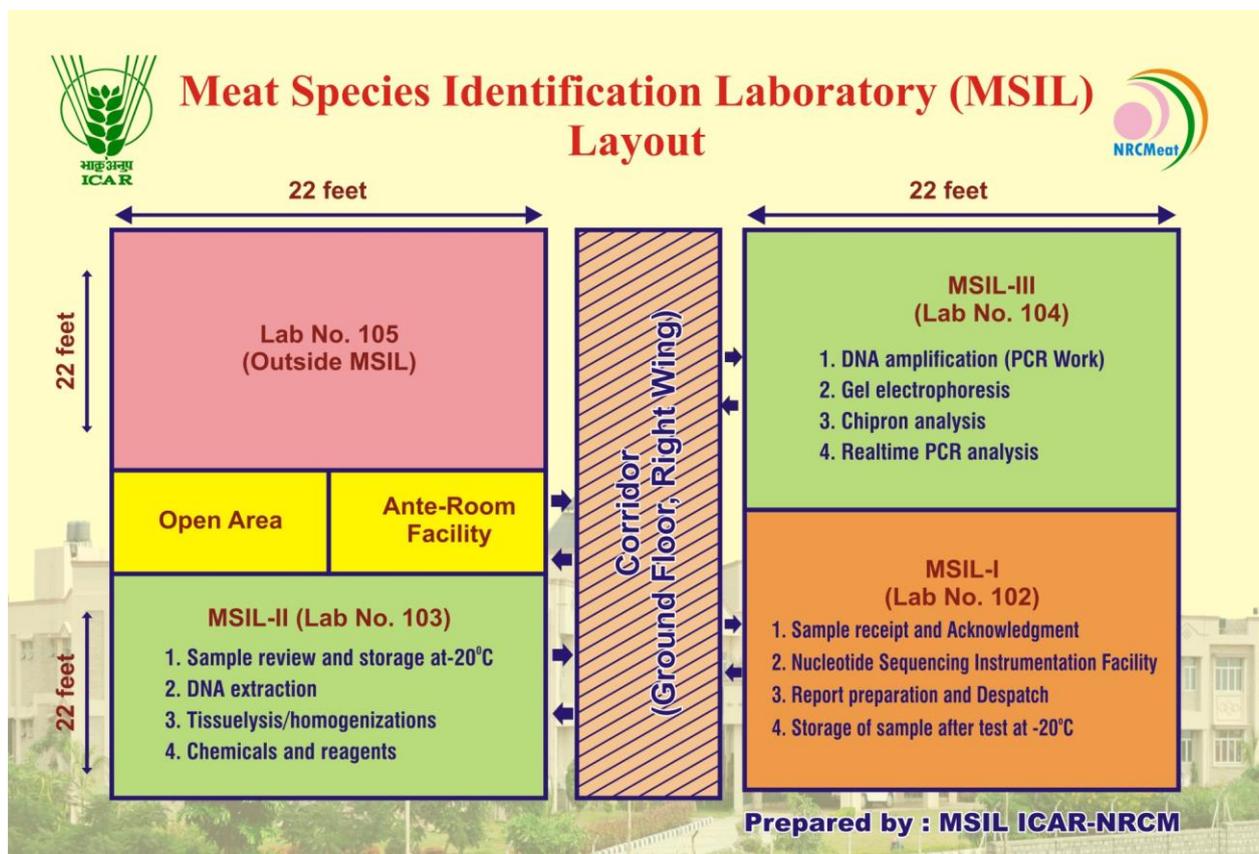


# Information of equipment and services of Meat Species Identification Laboratory (MSIL), ICAR - NRC on Meat, Hyderabad.



**Laboratory Head & QM:** Dr S. B. Barbuddhe, Director, ICAR-NRCM.

**Laboratory In-charge & TM:** Dr Vishnuraj M. R., Scientist, ICAR-NRCM.



1. Droplet digital (dd-PCR) PCR machine including droplet generator, plate sealer, thermocycler and droplet reader (Made: Bio-Rad, QX 200).

**Principles:** In dd-PCR, sample is separated into a large number of partitions and the reaction is carried out in each partition individually. This separation allows a more reliable collection and sensitive measurement of nucleic acid amounts, compared to analogue PCR.

**Applications:** Amplification of DNA in rare events detection or mutation studies and when the copy number of DNA is suboptimal for analogue PCR.



## [2. Automated electrophoresis unit \(Made: QIAxcel Advanced from QIAGEN\)](#)

**Principles:** Automated electrophoresis unit work on the principle of capillary electrophoresis and size, quality and concentrations of nucleic acids were measure in comparison with some markers.

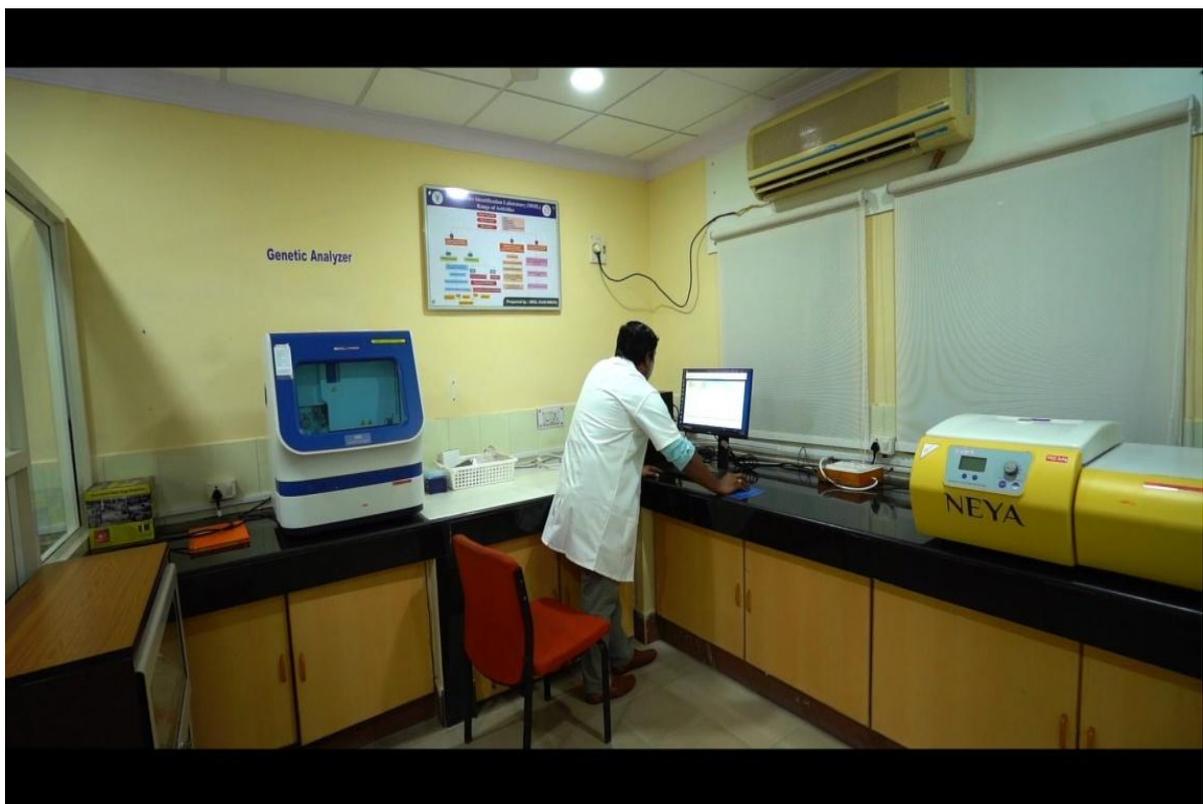
**Applications:** DNA/RNA quality control study, detection of base pair size and concentration. It can also be used to detect the RIN (RNA integrity number) score for large and small RNA studies for any downstream applications.



### 3. Genetic Analyzer (ABI 3500, Applied Biosystems)

**Principle:** Sanger sequencing works on the principle of dideoxy chain termination technology followed by capillary electrophoresis.

**Applications:** Nucleotide sequencing and fragment analysis.



#### [4. Low cost and density \(LCD\) meat macro array system with chip scanner and Chipron software \(Made: Chipron\)](#)

**Principles:** Chipron technology works on the principle of universal amplification of suspect DNA and further hybridization of the specific PCR product using highly species specific probes coated on a DNA macro array chip.

**Applications:** Detection of 32 different species of food animals in a single DNA macro array chip.



### 5. Real time PCR machine (Made: Bio-Rad. CFX 96)

**Principles:** Real time PCR monitors the amplification of a targeted DNA molecule during the PCR, i.e. in real-time, and not at its end, as in conventional PCR. Real-time PCR can be used quantitatively to detect the concentration of nucleic acid based on Ct values.

**Applications:** Real time PCR for quantification of DNA or RNA in samples.



6. End point PCR (Made: Bio-Rad C1000 touch and PegLab version PEQSTAR 2X Gradient).

**Principles:** A thermocycler is used to amplify a segment of DNA, called target DNA, using a set of complimentary primers and a polymerising enzyme.

**Applications:** Amplification of DNA, standardization of PCR conditions, cDNA synthesis.



### 7. High speed refrigerated centrifuge (Made: Thermo Scientific, RC6+)

**Principles:** Centrifugation under refrigerated temperature

**Applications:** mainly used in extraction of DNA from difficult-to-extract samples, and in most of temperature sensitive chemical measurements.



### 8. Ultrasonicator (Made: Branson)

**Principles:** Sonication is the act of applying sound energy to agitate particles in a sample, for various purposes. Ultrasonic frequencies (>20 kHz) are usually used, since it is called as ultra-sonication

**Applications:** nanomaterial synthesis, Bacterial/other cells disintegration



### 9. Electrophoresis assembly with gel documentation facility (Made: Bio-Rad and Alpha Innotech).

**Principles:** the agarose gel act as a molecular sieve and DNA molecule has a net negative charge and hence it migrates towards positive electrode in buffer solution. The DNA molecule gets resolved in the gel depending upon its molecular weight (size/ length in base pairs).

**Applications:** nucleic acids or PCR amplicons can be visualized using gel electrophoresis.



**10. Nano drop spectrophotometer (Made: Shimadzu)**

Cost for equipment sparing (no sparing of chemicals/reagents): Rs. 200/- per hour.



**Principles:** The NanoDrop functions by combining fiber optic technology and natural surface tension properties to capture and retain minute amounts of sample compared to cuvettes or capillaries. Furthermore, the system employs shorter path lengths, which result in a broad range of nucleic acid concentration measurements.

**Applications:** Measurement of quality, purity and concentration of extracted RNA/DNA and proteins.



Sample preparation and DNA extraction (Room No: 1)



PCR and gel visualization facility (Room No: 2)



Nucleotide sequencing instrumentation facility (Room No: 3)