

# Introduction to Diagnostic Techniques in

# Animal Health

(A concise, easy-to-read guide for students, veterinarians, and animal health technicians)

## 1. Why Diagnostics Matter

| Reason                        | What It Means for the Animal                             |
|-------------------------------|----------------------------------------------------------|
| Early detection               | Treat disease before clinical signs become severe        |
| Accurate identification       | Choose the most effective therapy, avoid misuse of drugs |
| Epidemiology & control        | Track outbreaks, implement bio?security measures         |
| Animal welfare & productivity | Reduce pain, improve growth, milk yield, reproduction    |

## 2. Main Categories of Diagnostic Techniques

| Category                               | Typical Use                               | Examples                                                              |
|----------------------------------------|-------------------------------------------|-----------------------------------------------------------------------|
| <b>Clinical Examination</b>            | Rapid, on-site assessment                 | Visual inspection, palpation, auscultation, gait analysis             |
| <b>Laboratory Tests</b>                | Confirm or quantify disease agents        | Hematology, serum chemistry, serology, microbiology, molecular assays |
| <b>Imaging</b>                         | Visualize internal structures             | Radiography, ultrasonography, CT, MRI, endoscopy                      |
| <b>Post-mortem (Necropsy)</b>          | Determine cause of death, collect samples | Gross necropsy, histopathology, toxicology                            |
| <b>Field/Point-of-Care (POC) Tests</b> | Immediate decisions in the field          | Lateral flow strips, portable PCR, handheld refractometers            |

### 3. Sample Collection – The Foundation of Accurate Diagnosis

| Sample Type | Key Collection Tips | Common Preservation |
|-------------|---------------------|---------------------|
|-------------|---------------------|---------------------|

# Introduction to Diagnostic Techniques in

## Animal Health

|                                              |                                                                                            |                                                                                     |
|----------------------------------------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Blood</b>                                 | Use proper anticoagulant (EDTA for CBC, heparin for chemistry). Collect from a clean site. | Keep cool (4°C) if processed within 24h; freeze plasma/serum for longer storage.    |
| <b>Urine</b>                                 | Midstream or catheterized; avoid contamination.                                            | Refrigerate; add preservative for bacteriology.                                     |
| <b>Feces</b>                                 | Fresh, preferably within 2h of defecation.                                                 | Keep at 4°C; use transport media for parasites.                                     |
| <b>Swabs (nasal, ocular, vaginal, wound)</b> | Rotate swab gently, avoid touching surrounding skin.                                       | Use Amies or Stuart transport medium; keep cool.                                    |
| <b>Tissue/Biopsy</b>                         | Sterile technique, minimal crush artifact.                                                 | Fix in 10% neutral buffered formalin for histology; snap-freeze for molecular work. |
| <b>Serum/Plasma</b>                          | Allow clotting (serum) or separate plasma promptly.                                        | Freeze at –20°C or –80°C for antibody/antigen assays.                               |

*Always label samples with animal ID, date, time, and specimen type.*

---

## 4. Laboratory Diagnostic Methods

### 4.1 Hematology & Serum Chemistry

- **CBC (Complete Blood Count)** – evaluates anemia, infection, inflammation, stress.
- **Biochemistry panel** – liver/kidney function, electrolytes, muscle enzymes, glucose.

### 4.2 Microbiological Culture

| Step                  | Purpose                                                               |
|-----------------------|-----------------------------------------------------------------------|
| <b>Inoculation</b>    | Transfer sample to appropriate media (aerobic, anaerobic, selective). |
| <b>Incubation</b>     | Provide optimal temperature (often 37°C) and atmosphere.              |
| <b>Identification</b> | Morphology, Gram stain, biochemical tests, MALDI-TOF MS.              |

# Introduction to Diagnostic Techniques in

Step

Purpose

Antimicrobial  
susceptibility

**Animal Health**  
Disk diffusion or broth microdilution ? guide therapy.

## 4.3 Serology (Antibody Detection)

- \*\*