

## CHAPTER IV: INFECTIOUS AND CONTAGIOUS DISEASES OF ANIMALS

### SECTION - 2

#### COLLECTION OF SPECIMENS

Livestock and poultry usually suffer from diseases of bacterial, viral, parasitic, fungal and metabolic origin. Prompt and accurate diagnosis of the disease based on symptoms and laboratory examination of the relevant materials is essential for initiating treatment at appropriate time. It is the duty of concerned Veterinary Surgeon in the event of an outbreak of contagious disease to obtain timely confirmation of his/her tentative diagnosis by microscopical or other examinations required. Materials required for detailed study should be sent to the nearest Clinical Laboratory Unit/ Regional Disease Diagnostic laboratory/ Chief Disease Investigation Office. In the case of notifiable diseases confirmation of diagnosis should be made by a higher laboratory (minimum a regional laboratory) and the results should be declared only by the Director of Animal Husbandry.

The following points should be considered while collecting clinical samples for laboratory diagnosis.

1. Sterile containers and clean grease free glass slides should be used for collection of samples.
2. All samples collected should be accompanied by full history of disease outbreak namely species affected, duration of disease, clinical signs, morbidity and mortality rates, disease suspected etc.
3. The collected biological specimens should be transported on ice to the nearest laboratory as early as possible (preferably within 24-48 hours).
4. Blood for cultural examination should be collected in anticoagulant preferably in sodium citrate or sodium oxalate. (1 ml of 3.8 % sodium citrate solution per 10 ml of blood).
5. Blood for hematological examination should be collected in an anticoagulant preferably EDTA (1-2 mg EDTA per ml of blood or 1 drop of 10% solution of EDTA in water per 5ml of blood)
6. About 10 ml of blood, 5 ml sterile serum, 10 ml of milk, 10 ml of urine, 20 gram of tissues etc should be collected in sterile vials for isolation of microorganisms.
7. About 25 gms of faecal sample should be collected for parasitological examination.

8. Materials collected for bacteriological examination should be kept at refrigeration temperature (4°C) in case of delay of transportation. If a viral etiology is suspected the material can be stored at -20 to -80° C.
9. Specimen for bacteriological or virological examination should be sent without any preservatives in sterile containers.
10. For serological tests paired serum samples should be collected (about 2ml sera). One serum sample should be collected at the onset of disease and second sera after recovery (3-4 weeks) from disease preferably on 21<sup>st</sup> day from the same animal. If this is not possible, collect serum samples from at least 5% of the recovered animals of the same area.
11. If death is reported, the post-mortem examination should be conducted at the earliest as putrefied materials are unfit for laboratory examination.
12. Detailed post-mortem report should be attached along with the samples collected during postmortem.
13. The different virological transport media that can be used are 50% Phosphate Buffered Glycerol Saline, 50% Glycerol saline and Phosphate Buffered Saline (pH 7.2-7.4). Collect samples in sterile containers when a transport media is not available and despatch them on ice as early as possible.
14. For Histopathology (HP) studies, tissues should be preserved in 10% formol saline. The volume of formalin used should be approximately 10 times the volume of material. Specimen bottles with wide mouth should be used for collecting tissues. Specimen size should not be more than 1-2 cm<sup>3</sup> and the tissue should be cut in such a way that it includes both the lesion as well as the normal tissue.
15. The specimen bottles should be sealed well so as to avoid leakage and labelled clearly indicating the fixative/transport media used.
16. Blood smears before despatch, should be fixed in methanol for 1-5 minutes unless otherwise specified.
17. Impression smears from tissues should be heat fixed (by passing over the flame for about 5 seconds) before dispatch. Care should be taken not to burn the smear.
18. In case of outbreaks, try to collect materials from as many ailing animals (5-6 or more) as possible at the peak of body temperature /clinical signs.
19. Ailing birds are preferred in case of poultry rather than any clinical samples.

## **Materials to be collected and examined for diagnosis**

### **A. Parasitic infections**

1. Faecal matter – To detect presence of eggs of trematode and nematode parasites, larvae of nematodes, eggs and segments of cestodes, mature and immature helminths various stages of intestinal protozoa and larvae of certain arthropod parasites.
2. Blood – Intra and extra cellular protozoan parasites and microfilaria

3. Skin scrapings – All stages of mites, fungus
4. Nasal discharge and sputum – Ova of *Schistosoma nasalis*, *Paragonimus*, *Syngamus*, larvae of *Oestrus ovis*, *Dictyocaulus viviparus*
5. Urine – Ova of *Dioctophyma*, *Stephanurus*, *Capillaria*, *Trichomonas*, *Trypanosoma equiperdum*.
6. Eye discharge – Eggs and larvae of *Thelazia*, eggs and adults of *Oxyspirura*
7. Ear contents – Different stages of ticks and mites
8. Cerebrospinal fluid – Microfilariae, Trypanosomes
9. Exudates from skin – Microfilariae
10. Skin biopsy – Filarial and spirurid nematodes
11. Lymph node biopsy – Schizonts of *Theileria*, Morulae of *Anaplasma bovis*

## B. Toxicoses/Poisonings

### 1. Aflatoxicocis : Materials to be collected

- 100 gm of suspected feed (specially groundnut cake)
- Liver and spleen in 10% formol saline
- Liver and spleen on ice

### 2. Poisoning cases

For chemical analysis fresh tissues and fluids should be sent as soon as possible and on ice. Avoid addition of preservatives to the samples. Use 95% ethanol @ 1ml per gram of sample when necessary.

Sl No.	Suspected poison	Required Specimen
1	Arsenic	Liver, Kidney, Whole blood, Ingesta
2	Cyanide	Ingesta, Liver, Muscle, Oxalated blood, Feed
3	Fluoride	Bone, Teeth
4	Insecticide (chlorinated hydrocarbons)	Fat, Liver, Ingesta, Brain
5	Insecticides (Organophosphates)	Oxalated blood, Liver, Ingesta, Brain
6	Lead	Kidney, Liver, Urine, Blood
7	Rodenticides	Oxalated blood, Ingesta, Liver, Urine
8	Urea	Feed, Whole blood, Rumen contents

### 3. Plant poisoning

#### Materials to be collected

- Sample of suspected grass/fodder/plants
- Liver on ice
- Stomach contents on ice

## C. MISCELLANEOUS CONDITIONS

### 1. Abortion

- Whole foetus/ all internal organs of foetus on ice
- Vaginal swab in PBS
- Pieces of placenta in sterile vials on ice
- Pieces of placenta in 10% formalin
- Paired serum samples

### 3. Ethmoid tumour

- Nasal discharge in sterile vials
- Deep nasal swab
- Tumour tissue in 10% formol saline

### 4. Infertility and sterility

- Semen in sterile vials
- Prepuccial swab on ice
- Paired serum sample on ice

### 5. Pyrexia of unknown etiology

- Blood smears
- Blood collected in EDTA
- Paired serum sample on ice

### 6. Diseases of unknown etiology

- Feed/ Fodder
- Blood smears
- Urine sample
- Faecal sample
- Blood samples collected in EDTA on ice from live animals

- Serum samples from live animals
- Stomach contents, spleen, lung, lymph node, liver, kidney, intestine in sterile vials from dead animals on ice
- Stomach contents, spleen, lung, lymph node, liver, kidney, intestine in 10% formol saline

### **Information to be furnished along with the Clinical Samples**

1. Address of the sender with pin code :
2. Nature of the sample :
3. Laboratory test desired :
4. Disease suspected :
5. Date of collection of the sample :
6. Preservative / transport medium used :
7. Details of source animal
  - a. Species :
  - b. Breed :
  - c. Age :
  - d. Sex :
8. Clinical History :
9. Any other information / remarks :

Place:

Signature:

Date:

Name & Designation:

## CHAPTER IV: INFECTIOUS AND CONTAGIOUS DISEASES OF ANIMALS

### SECTION 3

#### PREVENTIVE VACCINATION

##### GENERAL INSTRUCTIONS FOR VACCINATION

1. The veterinarian should decide whether vaccination is to be carried out or not when
  - a. There is no disease
  - b. The area is endemic
  - c. There is a threat of an outbreak- all types of vaccines cannot be used at the face of an outbreak. The strategies can be elimination, segregation, and observation as the case may be.
2. Availability of vaccine on the day fixed for it
3. Availability of required man power/ labour to complete the vaccination.
4. Make sure that whole population in the vicinity is covered. The left out should be minimum. Eg. Young animals and animals in advanced pregnancy. These animals should also be vaccinated as soon as they are fit for it
5. Vaccination should be carried out in the cool hours of the day preferably early in the morning before 11 AM.
6. Transportation of the vaccine should be made as fast as possible and cold chain should be maintained throughout, until it is used. The vaccine should not be exposed to direct sunlight
7. Multi- dose vials of vaccines should be used within the specified time frame after opening. Prolonged storage of such bottles / vials after opening is not desirable.
8. Manufacturer's instructions should be followed strictly to get the best vaccination results and to avoid unnecessary complications.
9. In case of live vaccines, antiseptics or disinfectants like spirit, iodine, or dettol should not be applied before or after vaccination. If necessary, cleaning alone need be done with dry cotton to remove dirt and dust if any.

10. After use, burn and destroy the left over vaccines and the used containers if sterilization facility is not available.
11. Live viral vaccines are contra indicated in pregnant animals.

Note : The following may be observed when the vaccines are given in drinking water for poultry

1. Do not use chlorinated water.
2. The waterers should be thoroughly cleaned before use but for cleaning disinfectants should not be used.
3. The vaccination should always be done during the cool hours.
4. Use clean and cold water. Small ice blocks can be added to keep it cool, if necessary.
5. Mixing proportion of vaccines and drinking water should be strictly followed as per the recommended schedule.
6. When stabilizers like skimmed milk powder is used, it should be evenly dissolved in water and formation of lumps should be avoided.
7. Provide ample water space so that all birds can get access to the water comfortably.
8. Withhold drinking water 2-6 hours before giving vaccine- This period can be varied depending upon season and age of the birds.

## Vaccines

A vaccine is a preparation intended to produce immunity to a disease by stimulating the production of antibodies. Vaccines contain, for example, suspensions of killed or attenuated microorganisms, or products or derivatives of microorganisms. The most common method of administering vaccines is by inoculation.

Vaccines which are not manufactured in the Institute of Animal Health and Veterinary Biologicals, Palode can be procured from the premier Veterinary Institutes in the country like Institute of Preventive Medicine, Ranipet, the Indian Veterinary Research Institute, Izatnagar or the Institute of Animal Health and Veterinary Biologicals, Hebbal, Bangalore etc. In emergencies vaccines can also be purchased from public sector undertakings.

Veterinary Surgeons should place indents for supplies of biological products to District co-ordinator, Animal Disease Control project. The DC should collect the vaccine and distribute to local institutions. The vaccine can also be stored at Taluk level for ease of supply under the custody of Taluk co-ordinator. Supplies of biological products should not be done to private veterinary practitioners on payment from supplies.

## Unspent stock

1. As soon as a Veterinary Surgeon finds that the biological products already indented for and supplied to him have been in excess of his requirements, and if the stock

is not likely to be utilized by him within 15 days from the date of receipt in the case of vaccines, he should notify the fact to District Animal Husbandry Officer in writing, and such unspent balances should be used within the district at the earliest opportunity.

2. The District Animal Husbandry Officer should examine during their inspections, the quantities of vaccines and biologicals indented for, and actually used.
3. Officers who fail to comply with the directions would themselves become liable.

### **Vaccinations/Inoculations**

1. All concerned officers must have sufficient stock of vaccines and biologicals that he can use in correct dosage for treatment or prophylaxis.
2. No vaccines and biologicals should be used later than 24 hours after the packing has been opened and exposed for use. Unused quantities, if any, should be discarded and accounted as such
3. A fresh bottle/ vial/ ampoule should be opened only after the contents of the ones already opened have been fully utilized or accounted for.
4. In the event of part or whole of any consignment of any biological product received is found to be apparently abnormal for any reason, the Officer concerned should report the fact to his District Animal Husbandry Officer for immediate advice and instructions.
5. Precautions for sterilization of equipment and safe and proper administration of all sera and vaccines should under no circumstances be neglected.
6. A Veterinary Surgeon should in cases of severe reactions or accidents following inoculation/Vaccinations against contagious diseases, intimate the fact promptly by message or telephone to District Animal Husbandry Officer concerned.
7. Precaution should be taken to maintain the cold chain during handling and transportation of vaccine.
8. All veterinary institutions including the Sub Centre should carry out routine vaccination on a fixed day in a week and also during a campaign period.



## General Vaccination Schedule for Livestock and Poultry

### 1. Cattle & Buffalo

Name of Vaccine	Species	Age	Dose *	Route*
Foot & Mouth Disease Vaccine	Cattle, Pigs, Sheep & Goat	Primary vaccination at 4 months of age. First vaccination 9 months after primary vaccination. Annual re-vaccination	Cattle & Pig- 2 ml Sheep & Goat -1ml.	Intra Muscular
HS/BQ Combined Vaccine	Cattle	Primary vaccination at 6 months of age or above Annual re-vaccination	4 ml based on body weight	Subcutaneously
HS Vaccine (Oil adjuvant Vaccine)	Cattle, Goat	Primary vaccination at 6 months of age or above, Booster dose after 6 months Annual re-vaccination	Up to 140kg-2ml Above 140 kg -10 ml	Intra Muscular
HS Vaccine (Broth Vaccine)	Cattle Goat	Primary vaccination at 6 months of age or above Used in out breaks only	Up to 140kg-2ml Above 140 kg-10 ml	Subcutaneously
Anthrax Vaccine Spore vaccine	Cattle	All age Booster after 6 month. Annual re-vaccination	Cattle- 1 ml Pig -0.5ml Sheep/ goat - 0.2 ml	Subcutaneously
BQ (Polyvalent vaccine)	Cattle	All age Booster after 6 month. Annual re-vaccination	Up to 140 kg-2ml Above 140 kg -10 ml	Subcutaneously

## 2. Dogs

Name of Vaccine	Species	Age	Dose	Route
Anti-Rabies vaccine	Dogs & Other Domestic Animals	Prophylactic dose at 2 months of age. 1st Booster dose after 1 month Annual revaccination is recommended.	1 ml.	Intra Muscular or Subcutaneously
Canine Distemper Vaccine	Dogs	Prophylactic dose at 2 months of age. Booster dose after 1 month Annual revaccination is recommended.	1 ml.	Intra Muscular or Subcutaneously
Parvovirus Vaccine	Dogs	Prophylactic dose at 2 months of age. Booster dose after 3 weeks Annual revaccination is recommended.	1 ml.	Intra Muscular or Subcutaneously

## 3. Pigs

Name of Vaccine	Species	Age	Dose	Route
Swine Fever vaccine	Pigs	1. Fattening pigs –A single dose at the age of 1-2 months. 2. Breeding pigs-1st vaccination at the age of 1-2 months. 2nd vaccination at 6 months after 1st vaccination. Revaccinate once a year.	1 ml	Intra Muscular or Subcutaneous

## 4. Poultry Vaccinations

### 1. Layers

Name of Vaccine	Age	Dose	Route
RD (F)	5-7 <sup>th</sup> day	-	Occulo nasal
I.B.D.	14 <sup>th</sup> day	-	Intra Occular or Drinking water
I.B.D. (booster)	28 <sup>th</sup> day	-	Drinking water
Fowl Pox	6 <sup>th</sup> week	0.2 ml.	Prick method
R2B, RDV(K)	8 <sup>th</sup> week	0.5 ml.	Subcutaneous
R2B, RDV(K)	16 <sup>th</sup> week	0.5 ml-	Subcutaneous

### 2. Broilers

Name of Vaccine	Age	Route
RDF	3-5 <sup>th</sup> day	Intra Occular or Intra Nasal
I.B.D.	10 <sup>th</sup> -14 <sup>th</sup> day	Intra Occular or Drinking water
I.B.D. (booster)	28 <sup>th</sup> day	Drinking water

### 3. Duck

Name of Vaccine	Age	Route
Duck Pasteurella	4 <sup>th</sup> weekAt 450-500gm; body weight	0.3 ml Intra Muscular
Duck Plague.	7 <sup>th</sup> weekIn endemic areas -1st 3 wk1st booster- 4 <sup>th</sup> wk2nd booster- 4 <sup>th</sup> month latter	0.5 ml Subcutaneous
Duck Plague (Booster)	12 <sup>th</sup> week Then annually	0.5 ml Subcutaneous
Duck Pasteurella	Repeat every 6 month	0.5 ml Intra Muscular

\* In general or otherwise advised, shall be as per the manufacturer's directions

## CHAPTER IV: INFECTIOUS AND CONTAGIOUS DISEASES OF ANIMALS

### SECTION 4

### DISEASES OF LIVESTOCK AND POULTRY

#### BACTERIAL DISEASE

Sl. No	Disease, etiological agent and species affected	Important symptoms	Specimens to be collected	Control/ treatment
1	<b>Anthrax</b> ( <i>Bacillus anthracis</i> ) All animals except birds, Transmissible to man.	Ruminants, Per acute – Sudden death without clinical symptoms. Acute – High temperature, abdominal pain, sudden death, carcass bloated, Oozing of blood from natural orifices. Horse – septicaemia with enteritis and colic, swelling of the neck. Death in 48 to 96 hrs. Pig- Pharyngeal, intestinal or septicaemia form. oedematous swelling of throat and neck. Carnivores- mostly intestinal form.	Post Mortem should not be done. 1. Blood smear, 2. Ear or muzzle piece. 3. Swab from blood or superficial exudates. 4. smear from pharyngeal swellings. (pig and horse) Ear piece in 10% formalin, swab on ice.	Anthrax spore vaccine. Protection in 2 weeks. Booster dose every year. Large animal 1ml s/c Small animals 0.5 ml s/c Elephant 1ml s/c .Repeat after 1 month with 3 ml. Vaccinate at 6 <sup>th</sup> month interval in endemic areas.
2	<b>Black Quarter</b> ( <i>Clostridium chauvoei</i> ) cattle, buffalo, sheep	6 months to 2 year old animals in good condition are affected. Animals sometimes die	Exudates from swellings on ice, muscle piece from affected	Formalized alum precipitated whole culture. Dose 2ml s/c. Broth vaccine

		without any pre monitory symptoms. Fevered animals show lameness/stiffness Affected region may show trembling and violent twitching. Crepitating swelling on hind or fore quarters.	area on ice, smear from fluids in paper packing, in putrefied carcass send long bones in charcoal. (Blood smear need not be send)	- Immunity develops in two weeks. 2 <sup>nd</sup> dose after 2 weeks. Dose -Large animals 5- 10 ml. Small animal 2-3ml s/c. HS- BQ Combined Oil adjuvant vaccine is also available. The dose is as per the manufactures direction.
3	<b>Haemorrhagic septicaemia</b> Pasteurellosis ( <i>Pasteurella multocida</i> ) cattle and buffalo	High temperature, drop in milk yield, abdominal pain, diarrhoea or dysentery, rapid respiration, cyanotic mucus membrane, oedema on neck or brisket Bronchopneumonia accompanied by fever.	Blood smear taken at the height of temperature. For cultural examination, heart blood or intestinal organs, Long bones in case of putrefied carcass.	Sulpha - Trimethoprim is the drug of choice for cattle. Other broad spectrum antibiotics. Broth vaccine and oil adjuvant vaccine available. Formalized Alum Precipitated vaccine is also used. Dose Oil adjuvant 2-3 ml annually (cattle and Buffaloes) Broth 5-10ml before monsoon.
4	<b>Mastitis</b>	Clinical a. Per Acute- Animal febrile, off feed b. Acute form-Inflammation of the gland severe but no systemic reactions. c. Chronic - when inflammation is mild, gland not swollen, pain and heat absent 9 In general high fever, swelling of udder and straw coloured milk for coli form mastitis and thick yellowish milk with clot for	Mid stream milk is collected aseptically in sterile bottles before antibiotic treatment (on ice through a special messenger.)	Treatment depends on the result of antibiograms. Better hygiene and management of dairy animals. Teat dipping with 0.5 % Iodophore solution. Dry cow therapy with long acting antibiotics.

		staphylococcal and streptococcal mastitis). Presence of clot in watery fore -milk is the only abnormality. Induration is most readily palpable in the cistern and lower part of the udder. <i>S.aureus</i> and coliforms.		
5	<b>Brucellosis</b> (cattle ,goat, pig and dog)	In cattle abortion at 7-8 months of pregnancy. In chronic case abortion less common but retained placenta is seen. In bull unilateral orchitis synovitis and hygroma of knee. In sheep and goat abortion at 3-4 months of pregnancy- sometimes at full term, lameness, mastitis with discoloration of milk with clots. In acute form loss of weight, pyrexia, diarrhoea, infertility also seen. In pigs abortion or birth of weak pig lings. Lameness, Paralysis. Increased infertility in males and females. Early abortion in canines. In male dermatitis of scrotum, unilateral testicular atrophy.	Aborted foetus, placenta, serum after 21 days of abortion, In males- serum, prepucial washings, synovial fluids. Serum with 0.25 5 phenol or 1/10000 merthiolate as preservative for agglutination test and serum without preservatives for ELISA Test	Treatment not usually undertaken. Test and slaughter policy is usually practiced. Vaccination calves with strain 19 is recommended. Another vaccine (killed)45/20A is recommended for adult animals. Vaccinated (19 strain) animal give +ive STAT reaction. (Standard tube agglutination test)
6	<b>Tuberculosis</b> ( <i>Mycobacterium bovis</i> ) Cattle, goat, pig and sheep, transmissible to man	Depends on the organ effected. Pulmonary infection gives rise to dry cough, which will aggravate in pregnancy. In TB Mastitis milk is almost normal in the beginning and finally whey like and then milk production ceases. In chronic productive type, infection is limited to one quarter, gland being enlarged and indurated,	Suspected lesion containing organ (lung, liver, intestine) and impression smears, sputum, uterine discharge, faecal material, milk sent on ice, impression smears from internal organs sent in separate covers.	No treatment is completely successful. Chlortetracycline, Oxytetracycline, Bacitracin, penicillin, copper sulphate in drinking water can be tried Live attenuated Vallee vaccine - (live Johne's bacilli in

		normal symmetry of udder is lost		paraffin oil). For sheep heat killed vaccine (Sigurdsson vaccine). In govt farms the positive animals must be slaughtered/ euthanized
7	<b>Para-tuberculosis</b> (Johne's Disease) ( <i>M.avium subsp paratuberculosis</i> ) Cattle, sheep, goat	Chronic diarrhoea and emaciation. In sheep and goat diarrhoea emaciation and wasting is seen.	Rectal pinch, faecal material, mesenteric lymph node in postmortem	Treatment not done, slaughter the sero positive animals. Vaccination is carried out only in calves less than one month of age. Vaccinated animals give +ive reaction to Johnin and Avian Tuberculin Live attenuated vaccine, Vallee vaccine - (live Johne's bacilli in paraffin oil). For sheep heat killed vaccine (Sigurdsson vaccine). In govt farms the positive animals must be slaughtered/ euthanized.
8	<b>Colibacillosis</b> (White scour in calves) ( <i>E.coli</i> )	Seen in very young calf (1-3 weeks old) scouring, weakness, and prostration. In less acute case, calf is listless, fails to suckle and develop diarrhoea. Swelling at joints and pneumonia in a few cases. High temperature initially, shows abdominal pain, faeces loose in consistency containing mucous and blood, weakness, fall in	Faecal material in sterile vial for isolation of bacteria (on ice)	Fluid therapy, antibiotic therapy depending on the result of antibiotic sensitivity test. Calf should be kept in hygienic environment. Vaccination of pregnant cows with either purified <i>E.coli</i> K99+Pili or whole cell

		temperature, coma and death		containing sufficient K99+antigen. Administration of K99+specific monoclonal antibodies to calf during first 12 hours after birth is effective in reducing incidence when herd is unvaccinated.
9	<b>Tetanus</b> ( <i>Clostridium tetani</i> ) All animals	Symptoms similar in all animals: mild stiffness, unwillingness to move, last for 12-24 hours. General stiffness of limbs, head, neck and tail becomes rigid, tremor with restriction of jaw movement (locked jaw), anxious and alert expression, erect carriage of ears, absence of movement of eye lid, staring look, dilatation of nostril, drooling of saliva, constipation, retention of urine, temperature and pulse normal, bloat early sign in cattle, sweating may be profuse. Prolapse of 3 <sup>rd</sup> eye lid (Horse)	If there is any wound externally smears from the wound for microscopical examination and material for cultural examination Smear in separate cover, other materials (on ice).	Tetanus toxoid two injections 6-8 weeks apart and booster at 6 <sup>th</sup> month. Large animals 10 ml s/c or i/m. Small animals 3-5 ml s/c or i/m. One injection gives immunity for one year and revaccination in 12 months gives immunity for life. As a prophylactic measure, pregnant goats may be given 0.5ml tetanus toxoid in the 3 <sup>rd</sup> and 4 <sup>th</sup> months of pregnancy. Chance of recovery is high in cattle and less in horse and sheep. treatment is attempted by administration of Crystalline penicillin.



				Administration of tetanus anti-toxin before symptoms appear is also advised. Horse: 3000 units 12 hourly 3 injection. Muscle relaxants. 50,000 units of anti-toxin into CSF via Foramen Magna give good result. Lambs, kids and calves – 200-500 units or more twice daily.
10	<p><b>Leptospirosis</b> (<i>L.interrogans</i> serovar Icterohaemorrhagiae, pomona, Canicola, Hardjo, Grippotyphosa etc Transmissible to Humans.</p>	<p>In acute form in cattle, high temperature, depression, petechiae of mucous membrane, diarrhoea, severe jaundice, dark coloured urine and albumin, dyspnoea and mortality, calves more susceptible. In chronic form, stoppage of rumination, milk reduced or ceases red in colour and may contain blood clot and abortion. Sheep and goat: same symptoms. Pig: abortion, stillbirth, weakening, infertility, high temperature in acute cases. There may be jaundice, paralysis, and high mortality. Dog: High temperature, jaundice, vomiting, abdominal pain and petechiae in mucous membrane.</p>	<p>Collect blood in acute cases and urine in chronic cases (after 7-10 days) on ice. Blood in 1% sodium oxalate in phosphate buffer pH 8.1. Kidney and liver for cultural examination. Alkalinised urine (7.6) Serum from infected animals after 14 days with 1/10000 merthiolate. Kidney in 10% formalin, Mid stream urine from dam from the cases of abortion</p>	<p>Formalin inactivated alum precipitated vaccine containing more than one serotype is commonly used in cattle and pig. Control of rodents is an important measure for containing Leptospirosis.</p>

11	<b>Caseous lymphadenitis</b> <i>(Coryne-bacterium psuedotuberculosis)</i> Sheep and goat	Enlargement of sub-maxillary, pre-scapular, supra mammary, pre-femoral and popliteal lymph nodes. Lymph nodes rupture discharging thick caseous pus. In systemic case pneumonia, pyelonephritis, debilitating disease in ewes.	Pus from lymph node on ice.	Organism is susceptible to penicillin. It may not penetrate the caseous material to reach the organs. So surgical intervention advised. BCG vaccination in lambs of one month of age has been found to be successful in controlling the infection (Non specific resistance).
12	<b>Foot rot</b> <i>Dichelobacter nodusus</i> <i>Fusobacterium necrophorum</i>	Swelling and moistness of the skin of the inter-digital cleft Lameness and necrosis of the under-run of the cleft, walks on its knee. In systemic reaction - anorexia and fever - loss of weight	Pus from the lesion on ice.	Parenteral administration of penicillin/ oxytetracycline or sulphonamides and local treatment of foot lesions
13	Swine erysipelas – <i>(Erysepelothrix rhusiopathiae)</i> (Polyarthrititis in sheep)	In acute form, high fever, conjunctivitis, prostration, vomiting, constipation and then diarrhoea. Pink discolouration of the skin at the base of the ear, abdomen and thigh. Knee joint hot and painful. Urticarial form: milder than acute, diamond shaped areas develop on the skin followed by necrosis and sloughing of skin. Chronic form: seen in those which survive the acute and urticarial form: endocarditis and arthritis, difficulty to move and signs of dyspnoea. (In sheep: in acute form, characteristic	Blood smear, smear from internal organs. Smear in separate cover, internal organs in sterile vials on ice. In chronic cases impression smear from heart valve.	Chronic cases: Difficult to cure. Killed vaccines at 6-10 weeks of age and a booster 2-4 weeks later. If sows are vaccinated 3-6 weeks prior to farrowing then piglet need to be vaccinated at 10-12wks.

		lesion is a known suppurative arthritis manifested by heat and pain. In chronic form signs are not observed until 2-6 months)		
14	<b>Contagious caprine pleuro pneumonia (CCPP)</b> <i>Mycoplasma capricolum subsp capri pneumonia</i>  Goat and sheep	Rise in body temperature (41°C) mucopurulent nasal discharge, coughing, laboured respiration, salivation, diarrhoea and loss of weight. Abortion in pregnant animals. Mortality very high. Some cases arthritis with swelling of leg joints, lameness, oedematous swelling in head, neck and limbs.	Lung from infected animals (on ice).	Vaccination with aluminium hydroxide vaccine. Vaccine consisting of sonicated antigens of F 38 strains with incomplete Freund's adjuvant is also used. Auto vaccine effective in the herd.
15	<b>Fowl cholera</b> <i>Pmultocida</i> Poultry, turkey and duck	In acute cases birds may die without showing any symptom. In less severe form breathing rapid- open beak, feather ruffled, comb and wattle become cyanotic. There may be yellowish diarrhoea. In chronic form swollen comb and wattle, joints hot and painful. In duck acute haemorrhagic enteritis and oozing of blood from oral cavity noticed. Sudden death.	Blood smear from ailing bird, spleen, liver, lung etc. from sacrificed or dead bird in separate cover (on ice), long bones from putrefied carcass in charcoal packing. In chronic case smear from wattle	1. Killed vaccine 2. Formalinised vaccines with adjuvant 1 ml s/c
16.	<b>Duck septicaemia/ New Duck disease</b> <i>(Riemerella anatipestifer )</i> Ducks, Turkey	Young ducks (1-8 weeks) are highly susceptible. Listlessness - ocular and nasal discharge, mild coughing, sneezing, greenish diarrhoea, ataxia, tremor of head and neck and coma. In certain cases in adult ducks severe haemorrhagic enteritis with septicaemic lesions all over body noticed. Blood seen in the oral cavity at the time of death due to severe congestion	Affected bird or internal organs, especially heart, liver, spleen from affected bird in sterile containers (on ice).	A formalised whole culture vaccine is found to protect the bird for at least 3-6 months. A formalised oil adjuvant vaccine is also effective.

		of mucous membrane of oesophagus - sudden death noticed		
17.	<b>Pullorum disease</b> ( <i>Salmonella pullorum</i> ) Poultry	Chicks hatched from infected egg, moribund or dead chick may be seen in the incubator. Sometimes disease is not seen for 5-10 days. Peak mortality during second or third week. Affected birds may exhibit a shrill cry when voiding excreta, which is white or greenish brown. Infection spread within the flock for a long time without any distinct signs. Reduction in egg production, fertility and hatchability.	Ailing bird or freshly dead birds, or spleen, liver and intestine on ice from dead birds.	No treatment is likely to affect complete elimination of carrier from infected birds. No vaccination practised and all positive birds may be disposed off by slaughter. Birds recently vaccinated with <i>S.gallinarum</i> (9R) may give low titre. Since transovarian transmission of organism is there, only eggs from salmonella free flock should be used for hatching.
18.	<b>Fowl typhoid</b> ( <i>S.gallinarum</i> ) Poultry and turkey	Seen in young chicken and poults. Symptoms similar to pullorum disease. Birds show diarrhoea and greenish faeces and systemic disturbances.	Ailing bird or fresh carcass or liver, spleen and intestine from freshly dead birds by special messenger on ice	1. Killed vaccine, 2. Live vaccine (9 R strain). Drugs when used as prophylactic agent, 10 days withdrawal period before slaughter.
19.	<b>Paratyphoid infection of birds</b> with <i>Salmonella</i> other than <i>S. Pullorum</i> and <i>S. gallinarum</i>  Poultry, turkey, ducks and goose	Similar to pullorum	Two ailing birds Internal organs in sterile vials, by special messenger on ice.	Bacterin and attenuated live vaccines are used.

20.	<p><b>Collibacillosis</b> <i>E. coli</i> Poultry, turkey, duck</p>	<p>In acute form, symptoms resemble fowl cholera or fowl typhoid.</p>	<p>Ailing bird or internal organs in sterile containers through special messenger on ice</p>	<p>Faecal contamination of hatching eggs reduced by fumigating or disinfecting eggs within 2 hours of laying. Antibiotic administration after studying the antibiogram. Furazolidone is fed (0.04%) for 10 and days chlortetracycline in water (600 mg/5 L) for 5 days. Inactivated vaccine from 02:K<sub>1</sub> and 078: K SO strains are effective. For ducks, inactivated vaccine prepared from 078 strain is effective.</p>
21.	<p><b>Infectious coryza</b> (<i>Haemophilus paragallinarum</i>/<i>Avibacterium paragallinarum</i>) Chicken</p>	<p>Affects upper respiratory tract, sero mucoid nasal and ocular discharges and facial oedema, conjunctivitis with closed eyes.</p>	<p>Ailing bird or trachea and lungs in sterile containers on ice.</p>	<p>Sulpha drugs plus TMP, streptomycin, tetracycline, chloramphenicol, quinolone 2<sup>nd</sup> generation.</p>
22	<p><b>Erysipelas</b> (<i>Erysipelothrix rhusiopathiae</i>) Turkey, pigeon chicken.</p>	<p>Sudden death, especially in toms. Cutaneous lesions may be seen. Affected males have swollen discoloured turgid snood and dewlap.</p>	<p>Ailing bird, piece of liver, spleen in sterile vials on ice, bones of putrefied birds in charcoal, impression smears (from liver and spleen) and heart blood smear.</p>	<p>Crystalline penicillin is the drug of choice. Erythromycin and broad-spectrum antibiotics are also effective. Aluminium hydroxide absorbed whole cell of <i>E.insidiosa</i> (serotype 2) is effective.</p>

23	<p><b>Chronic respiratory disease (CRD)</b> <i>Mycoplasma gallisepticum</i> Chicken and turkey</p>	<p>Nasal discharge, shaking of head, coughing, swelling of the orbital sinuses and tracheal rales. Loss of weight, reduction in egg production and fertility, mortality low.</p>	<p>Ailing bird or trachea, air sac, turbinates and lung in sterile container from dead bird (on ice).</p>	<p>Chlortetracycline, tylosin, streptomycin, erythromycin or lincomycin can be tried. But some strains are resistant to tylosin, streptomycin, erythromycin or spiromycin. Dipping of egg prior to hatching in tylosin or chlortetracycline is advised for controlling the infection.</p> <ul style="list-style-type: none"> <li>• MG bacterin with oil emulsion adjuvant</li> <li>• Live vaccine F strain of MG can be used.</li> </ul>
24	<p><b>Gangrenous dermatitis</b> (<i>Clostridium septicum</i>, <i>C. perfringens</i> type A <i>S. aureus</i> singly or in combination) Poultry</p>	<p>Varying degree of depression, incoordination, leg weakness, ataxia, dark moist areas of skin devoid of feathers, overlying wings, breast, abdomen and leg, extensive blood tinged oedema with or without gas is present beneath the affected skin.</p>	<p>Ailing birds, swab collected from affected area.</p>	<p>No treatment is completely successful. Chlortetracycline, Oxytetracycline, Bacitracin, penicillin, copper sulphate in drinking water. Furaxone in feed</p>
25	<p><b>Psittacosis/ Ornithosis</b> (<i>Chlamydoiphila psittaci</i>,) Parrots and other psittacine birds, domestic poultry, turkey and ducks. Transmissible to man</p>	<p>Ruffled plumage, nasal discharge, watery greenish diarrhoea, pasting of feathers, wasting of pectoral muscles, nervous symptoms, respiratory symptoms.</p>	<p>Two ailing birds, impression smears from cut surfaces of liver, spleen and air sac impression smears</p>	<p>Broad - spectrum antibiotics, chlortetracycline 500-800 g/tonne of feed for 3 weeks. Doxycycline also tried</p>

## DISEASES OF LIVESTOCK AND POULTRY

### VIRAL DISEASES

Sl. No	Disease, etiological agent & species affected	Important symptoms	Specimens to be collected	Diagnosis	Treatment/ Control
1	<p><b>Foot and Mouth disease</b> <b>FMD</b> (Picorna virus) Cattle, pigs, sheep, goats, wild game animals and elephants.</p>	High fever, stringy salivation, smacking of lips, vesicles on the tongue, gums, dental pad, cheeks, around the muzzle, coronary band, interdigital cleft and udder.	scrapings from Vesicular fluid, the lesions, epithelial lining of buccal mucosa (material in sufficient quantity about 1 g) in 50% buffered glycerine pH 7.4 sent by post or in sterile containers on ice	Symptoms, CFT, ELISA, foot pad inoculation of guinea pigs, intraperitoneal inoculation of unweaned mouse, virus isolation in bovine thyroid cells, AGID, PCR.	Washing the mouth with 2% alum or 0.001% potassium permanganate lotion and application of boroglycerine paste, fluid therapy. Wash the feet with 2% copper sulphate, 4% sodium carbonate and apply fly repellents and antiseptics/ tar and copper sulphate dressing. Killed vaccine of cell culture origin. Primary vaccination 3-4 months, booster 1-3 months later, subsequently every 6 months. Vaccination done with gel vaccine. Oil adjuvant vaccine: Primary dose at 4 <sup>th</sup> month of age. Repeat at

					every 9 month interval. Recovered animals may act as carriers for several months. Pigs never act as carriers.
2	<b>PPR</b> (Peste des petits ruminants). (Goat Plague) Contagious disease of ruminants particularly goats.	Fever, dry muzzle and a serous nasal discharge later becoming mucopurulent. Marked salivation due to the erosions on the mucous membrane of buccal cavity. Ulcers in the mucosa of alimentary, respiratory and urinary tracts. Profuse diarrhoea resulting in severe dehydration. Conjunctivitis with ocular discharge is a constant feature	Nasal and ocular swabs, unclotted blood and scrapings of buccal and rectal mucosae. Samples of lung, spleen and lymphnode from animals slaughtered or died.	Symptoms and lesions, Virus isolation in Lamb kidney/vero cell lines and antigen detection. Antigen capture ELISA, competitive ELISA, CIE, AGID PCR and DNA probe	Quarantine of the suspected animals Attenuated vaccines are available 1ml S/C provides 3 years immunity.
3	Mucosal disease/ Bovine viral diarrhoea <b>BVD</b> (Flavi virus) Cattle	Sharp rise in temperature frothy salivation, mucopurulent oculonasal discharge, greyish white ulcers in the mouth, lower lip, gums, cheeks, tongue, foul smelling shooting diarrhoea. In atypical forms diarrhoea may be absent.	Whole blood at thermal phase. Spleen and mesenteric lymph node; pancreas, faecal samples with antibiotics; and paired serum samples. All samples should be sent on ice.	FAT and AGID test; virus isolation in bovine testis and spleen cells. Should be differentiated from rinderpest	Live attenuated vaccine either alone or in combination with IBR and P13 available. Pregnant animals should not be vaccinated. Vaccination not practiced in India.
4	<b>Viral enteritis in young</b>	Diarrhoea in young animals. Faeces may be watery, sometimes	Faeces and intestinal segments on ice.	Symptoms, Immunoelectron	Corona and rota viral vaccine available



	<b>animals</b> (due to rota, corona and astro viruses)	blood and mucus.		microscopy; FAT, ELISA, Detection of RNA fragments by PAGE analysis and RT-PCR in rotavirus infections	for oral administration of newborn calves and also for pregnant cows not very effective.
5	<b>Infectious bovine Rhinotracheitis/ Infectious Pustular vulvo vaginitis (IBR/IPV)</b> in cattle (Bovine Herpes virus)	Respiratory symptoms, abortions, sometimes genital infections. Vulvo-vaginitis in cows and balanoposthitis in bulls.	Nasal and vulval swabs or washings, tracheal and ocular swabs, aborted foetal liver, spleen and stomach contents. Paired serum samples. All on ice. Foetal liver may also be sent in 10% formol saline for HP.	Symptoms, virus isolation in bovine foetal kidney cells, SN, ELISA, FAT, PHA and PCR.	Modified live virus vaccines available, either alone or in combination with P13 and BVD. Vaccination of pregnant animals not advised.
6	<b>Ephemeral fever</b> (Three day sickness) (Rhabdo virus) Cattle	Sudden appearance of high fever, muscular shivering, shifting lameness, stiffness of joints and enlargement of peripheral lymph nodes, reduction in milk yield, recumbency as a later manifestation.	Blood at the hyperthermic stage, lymph nodes on ice. Lymph node biopsy/aspirate	Symptoms, inoculation into susceptible cattle, intracerebral inoculation into suckling mouse.	Antipyretics orally/parentrally. Apply liniments, warm fomentation. Recovered animals are immune for two years. Mouse attenuated live virus vaccines and BPL or formalin inactivated vaccines. Not practiced in India.
7	<b>Virus pneumonia/ Influenza/</b>	Fever, nasal discharge, dyspnoea and coughing.	Nasal swabs, nasal washings, Lymph node	Symptoms, virus isolation by	vaccines available for P13 either alone or in

	<b>para influenza</b> (Horse, pigs, sheep, goats and Cattle)		biopsy or aspirate, lung piece on ice. Lung piece in 10% formal saline for HP can be sent by post	Vaccines chick embryo inoculation cell cultures HA and HI tests, FA, VN and ELISA tests.	combination with IBR and BVD. Live and killed vaccines are being used against equine influenza.
8	<b>Cow pox and buffalo pox</b> (Pox virus) transmissible to man.	Small red papules on teat and udder; in buffalo the lesions may be seen around the eyes, neck region and sometimes throughout the body.	The lesion, against dried scabs in 50% glycerol saline.	Symptoms, virus isolation by CAM route of chick embryo inoculation. Pock lesions are seen on CAM; AGID test	No vaccine available. Observe strict hygienic measures- apply antiseptic ointments - Washing the udder and teat before and after each milking with antiseptic lotion.
9	<b>Sheep pox</b> (Pox virus)	High rise of temperature, increased respiratory rate, swollen eye lids, dermal oedema, with marked raised circular thickened plaques with congested borders. Lesions in wool free areas. Generalisation may occur - lesions in the oral, intestinal and respiratory tracts. Nodules in internal organs.	Skin lesions and affected tissues in 50% glycerol saline, pieces of affected tissues in 10% formal saline for HP.	Symptoms. Virus isolation in sheep or goat kidney cells /sheep testis fibroblasts. ID test, demonstration of cytoplasmic inclusions, VN test	Killed vaccines not effective- live virus vaccines various types available.
10	<b>Goat pox</b> (Pox virus)	Pocks on mucous membrane and skin, teat and udder.	Scrapings from cutaneous lesions in 50% glycerol saline.	Lesions, virus isolation in goat/sheep kidney cells, AGID test	Vaccination not often practiced.

11	<b>Contagious pustular dermatitis/</b> ORF in sheep and goats (Pox virus)	Pox like lesions on the lips - proliferative type of lesions in sheep and goats.	Scrapings from cutaneous lesions in 50% glycerol saline.	Lesions, Direct EM examination; virus isolation in cell cultures of sheep or goat origin; AGID test	Live vaccine (1% suspension of fresh scab in 50% glycerol inside the thigh at 1-3 months of age- annual vaccination for ewes.) Transmissible to man causing proliferative lesions of the hands and face.
12	<b>Papillomas</b> Various species of animals and man (Papilloma virus.)	Thickened rough nodules-sometimes large peduncular cauliflower like growth usually on head, neck, shoulder, udder, teat, etc.	Biopsy or the lesions on ice or buffered glycerin; by special messenger or by post	Lesions, direct EM.	No vaccines, auto vaccines prepared from the lesions are found to be effective particularly in the pedunculated forms.
13	<b>Blue tongue</b> Sheep, Goat & cattle (Reovirus)	High rise of temperature, copious salivation, oculonasal discharges, swelling and hyperaemia of the mucosa of the mouth, ulceration of the tongue, dental pad and lips. Tongue swollen, cyanotic, difficult to be retracted. Swelling and tenderness of the coronary band.	Blood during the hyperaemic stage, spleen and other lymphoid organs, lesion scrapings - on ice through special messenger. Paired serum samples on ice.	1. Symptoms 2. Virus isolation in developing chick embryos, bovine/ovine cell cultures, AGID test, FAT, CFT, VN, C-ELISA, Dot ELISA and Nested PCR.	Vaccination difficult as there is over 24 serotypes of the virus and transmission by insects - polyvalent live vaccine available - not practised in India.

14	<p><b>Swine fever</b> (Hog cholera) (European swine fever). (Flavi virus)</p>	<p>High rise of temperature, severe leukopenia, conjunctivitis, dyspnoea, vomiting, diarrhoea, purple discoloration of the skin of the abdomen, ears and snout Weakness of hind quarters- staggering gait Sometimes death immediate without clinical symptoms.</p>	<p>Whole blood, spleen, mesenteric lymph nodes and pancreas. Pieces of organs in 10% formol saline for HP.</p>	<p>1. Symptoms 2. PM lesions- button ulcers in the intestine, turkey egg kidney, inoculation into susceptible piglets, ID and FAT, ELISA and RT-PCR.</p>	<p>Attenuated live virus either lapinised or cell culture available from IVBP, Pune, IVRI, Izatnagar, IVPM, Ranipet, IAHVB, Bangalore, IVVI, Hissar. No relation with African swine fever. Vaccination should be initiated only when there is a history of the disease.</p>
15	<p><b>Rabies</b> All warm blooded animals including man and birds (Rhabdo virus)</p>	<p>Rapidly fatal encephalitis following a somewhat long incubation period. Excitement followed by paralysis and death in 3-6 days following the onset of clinical symptoms.</p>	<p>If possible send the whole carcass, in ice. If not, the brain or smears prepared from hippocampus, cerebellum and Ammon's horn fixed in absolute ethanol.</p>	<p>1. Symptoms 2. Demonstration of Negri bodies, FA test (FAT), Rapid Rabies Enzyme Immuno Diagnosis (RREID), Rabies Fluorescent Focussing Inhibition Test (RFFIT), Suckling mouse inoculation. Corneal impression smears and</p>	<p>1. Wash the wound with concentrated soap solution and paint with Tr.Iodine or spirit. Apply Antibiotic ointment 2. Give post-exposure anti-rabies treatment using TC vaccine containing 2.5 IU of virus. 3. Give Rabies Immunoglobulins 4. Control of stray dogs. Prevent contact with rabid animal 5. Compulsory</p>

				skin biopsy from the nuchal region of live animals can be used for FA test. Nucleic acid hybridization /RT-PCR	prophylactic vaccination and licensing of dogs. Live virus vaccines should not be used. Killed tissue culture vaccines are available for veterinary practice.
16	<b>Canine distemper/ hard pad disease.</b> Dogs and other canines; and mustelids. (Paramyxovirus)	Biphasic temperature, bronchopneumonia, chorea, vomiting, and diarrhoea, vesicular and pustular dermatitis particularly ventral aspect of the abdomen.	Whole blood, nasal or conjunctival secretions/ epithelium spleen and lung in ice or in 50% glycerol saline. Pieces of brain and lung in 10% formol saline for HP.	Symptoms, demonstration of inclusion bodies, Inoculation into susceptible animals – pups and ferrets, FA and ID tests	Fluid therapy Live cell culture vaccine available. Live virus vaccine in freeze dried form available
17	<b>Canine parvo viral enteritis</b> (Parvo virus) Dogs	Vomiting, haemorrhagic foul smelling diarrhoea, myocarditis, mild or sub-clinical in adults.	Fresh faecal Samples, Mesenteric lymph nodes, spleen and paired serum samples on ice. Serum in advanced stage	Symptoms, AGID, CIE, HA and HI tests, IEM, FA, ELISA and PCR	Live and killed vaccines are available. Live vaccine not to be given to pregnant animals. 1st vaccination at 6 –8 weeks, 1st booster at 10-12 weeks. Repeat annually. Live and killed virus vaccines are available. Single and multi component vaccines are also available.

18	<b>Infectious canine hepatitis</b> (Adeno virus) Dogs	High fever, vomiting, icterus and hematuria, diarrhoea, mucopurulent discharges, corneal opacity blue eye' in dogs. In foxes - fox encephalitis	Liver, spleen, lymph nodes. Urine preferably from bladder without preservative, paired serum samples on ice. Pieces of above tissues in 10% formol saline for HP.	Symptoms, virus isolation in canine cell cultures, intra-nuclear inclusions in hepatic cells. FA test	
19	<b>Canine corona viral enteritis</b> Dogs	Pyrexia, vomiting, diarrhoea, dehydration and death	Vomitus, diarrhoeic stool, whole blood	1. Symptoms 2. AGID, CIE, ELISA and IEM	Rehydration therapy, and symptomatic treatment, Inactivated tissue culture vaccine First vaccination at 7 <sup>th</sup> week. Booster after 4 weeks. Repeat annually.
20	<b>Newcastle disease (Ranikhet disease)</b> (Paramyxovirus). Chicken, turkey, pigeon and other birds	Increased respiration, drop in egg production, in coordination, tremor, torticollis, greenish mucoid diarrhoea, mucoid discharge from nares and beak; death in 2-10 days following onset of symptoms.	Tracheal and cloacal swabs, brain, spleen, liver, kidney; ailing birds serum samples from 10 birds in the flock on ice. Lung, spleen, brain in 10% formol saline for HP. One or two ailing birds preferred	1. Symptoms, 2. Virus isolation by chick embryo inoculation, HA and HI test, ID test and ELISA.	Primary vaccination with lentogenic vaccine (Lasota/ F/B) at the age of 5-7 days 1-2 drops by oculonasal route. This should be followed by a mesogenic vaccine (R2B/K) at 6-8th week and then between 16-20th week.
21	<b>Avian Influenza</b>	High fever, oculo-nasal discharge, cyanosis of	Tracheal and cloacal swabs,	Symptoms, virus is	Vaccination not being practiced.

	(Orthomyxo virus) Chicken, turkey, pheasant and water fowls	comb and wattles, oedema of head and neck, respiratory distress, drop in egg production and diarrhoea.	trachea, lung, air sac, liver and spleen on ice. Two ailing birds preferred and serum	olation by chick embryo inoculation; tracheal organ cultures; chicken cell cultures; SN and FA tests, HI, ELISA and RT- PCR.	Not a common disease, but has been isolated from respiratory infections in ducklings in Kerala
22	<b>Avian Infectious bronchitis</b> (Corona virus) Chicken	Rapid spread of coughing, gasping and rales among the birds of all ages particularly younger groups. There may be watery nasal discharge, lachrymation and facial swelling. Severe drop in egg production. There may be deterioration of external and internal quality of eggs - small size, misshapen, calcareous deposits, haemorrhage in the albumen or yolk	Lung and tracheal scrapings; tracheal swabs, kidney- on ice. Pieces of above tissues in 10% formol saline for HP. Paired serum samples. One or two ailing birds preferred	Symptoms, post mortem lesions, Isolation in chick embryo, HI, ELISA and PCR.	Live virus vaccine available. 2-3 weeks intra-ocular 4-5 weeks - intraocular/ drinking water (optional) 14-16 weeks - Drinking water (If killed vaccine is used, give i/m) Live virus vaccine at the age of 12-14 weeks - eye drop (cell culture vaccine)
23	<b>Infectious laryngo tracheitis</b> (Herpes virus) Chicken	Coughing, sneezing, difficult breathing, gasping and rales. The neck may be extended during inspiratory efforts - lachrymation, swelling of infra-orbital sinuses and drop in egg production.	Tracheal exudate; trachea and lung; preferably two ailing birds. Paired serum samples.	Symptoms, post-mortem lesions, haemorrhage in the trachea, larynx with tracheal lumen often filled with blood clots, mucus, caseous, yellowish	Not routinely practiced as the disease is not highly prevalent

				exudate or tracheal plugs. Intra-nuclear inclusion bodies in tracheal epithelium. Virus isolation by chick embryo inoculation. Pock lesions on CAM, ID, FAT and VN tests.	
24	<b>Infectious bursal disease</b> (Gumboro disease) Chicken (Birna virus)	Usually seen as an acute disease in chicks of 3-6 weeks of age. Severe depression, ruffled feathers, trembling, pecking the vent, diarrhoea.	Affected bursa, spleen, liver and kidney, on ice. Ailing birds are preferred. Paired serum samples from 10 cases each.	Symptoms, post-mortem lesions, enlargement of bursa about 3-4 times the normal size often with or without haemorrhage, oedematous, yellowish, gelatinous or caseous material inside. Virus isolation by chick embryo inoculation, chicken cell culture, ID and FA tests.	Live chick embryo vaccine 10-14 days 18-21 days (if maternal anti-bodies are present) - in drinking water. For layer and broiler breeders - 16th week - killed vaccine i/m.
25	<b>Marek's disease</b> (Herpes)	In classical form, paralysis of wings and legs - with one	Feather follicle epithelium, feather tips;	Inoculation into day old chicks. Virus	Live virus vaccine HVT strain chick



	virus) Chicken	leg stretched forward and the other held behind. Birds may show torticollis. In acute form mortality rate is high; birds may die suddenly without any preceding symptoms. Sometimes paralysis is exhibited as in classical form which continue at a steady rate for several months.	whole blood tumor tissue on ice. Ailing birds preferred through special messenger.	isolation in chicken kidney cells. Inoculation into developing chick embryos - yolk sac / CAM route. FA and ID tests.	embryo cell origin. Day hatch i/m. During epidemic for broiler and layer breeders booster dose at 3 weeks of age i/m. In VVM disease give bivalent vaccines.
26	<b>Avian leukosis</b> (Retro virus)	Should be differentiated from Marek's disease by the following features - develop only in chicks above 16-20 weeks of age; absence of nervous, skin, eye or muscular form of the disease; uniform involvement of bursa with nodular lesions due to intra-follicular infiltration of tumour cells. The tumour cells are of uniform type and LIVER IS THE MOST OFTEN AFFECTED ORGAN; Big liver disease.	Tumours / tissues	Gross lesions such as enlarged liver that is almost filled in the abdominal cavity with rounded borders, mottled with or without haemorrhages and reticular pattern. Intranuclear inclusion bodies in hepatic cells. Chick embryo inoculation and inoculation into chick embryo cell cultures - liver, lung or kidney cells. FA and ELISA tests.	
27	<b>Inclusion body</b>	Sudden increase in mortality rate which	Liver and faecal samples on ice.	Chick embryo inoculation	Strict management

	<b>hepatitis.</b> (Adeno virus). Chicks 4-9 weeks	lasts for 3-4 days. Anaemia and haemorrhage in various organs especially muscles	Ailing birds are preferred	and demonstration of I/N inclusions	practice. No vaccines.
28	<b>Egg drop syndrome- 76.</b> (Adeno virus) Chicken	Sudden drop in egg production. Change in quality of eggs - thin shelled, shell less, change in colour and misshapen eggs - peak incidence in layers of 29-31 weeks of age.	Cloacal swabs and paired serum samples - on ice.	Duck embryo inoculation. HA and HI tests and ELISA test	Sanitation. Killed vaccines are available. Given i/m at the age of 14-18 weeks for layer and broiler breeders.
29	<b>Runting and stunting syndrome</b> (Mal-abs orption syndrome; pale bird syndrome; Femoral head necrosis; Helicopter disease.) Reo virus, Entero virus, Toga virus.	Growth impairment; wet dropping from day 4 to three weeks; stunting, erratic feathers or broken feathers	Ailing chicks	Gross lesions, increased pericardial fluid, enlarged proventri- culus, decreased gizzard size, orange mucoid intestinal content which is only partially digested and atrophy of bursa.	Vaccination not practiced in India.
30	<b>Rhinotra cheitis</b> in turkey/ <b>swollen head syndrome.</b> Turkey rhinotra cheitis virus (a paramyxo virus) Turkey and chicken.	Rapid flock onset, nasal discharge, reddening of conjunctiva, swelling of lachrymal gland, swollen infra orbital sinus; change of voice; moist tracheal rales, coughing and sub-mandibular oedema.	Ocular, nasal, tracheal exudate/ swabs on ice. Ailing birds are preferred. Paired serum samples.	Symptoms, virus isolation in tracheal organ cultures. ELISA test	

31	<b>Viral arthritis</b> (Reo virus). Broiler chicks.	Bilateral enlargement of the shank and tendon above the hock in 6-7 weeks old broilers. Affected birds tend to sit and are reluctant to move.	Synovial fluid from the tibio-tarsal or tibio-femoral joints on ice through special messenger.	Symptoms, virus isolation in CAM of chicken embryo, inoculation into 2-day old broiler chicks via foot pad, i/m and oral routes.	
32	<b>Hydropericardium syndrome/</b> Angara disease/ Leechi disease (Adeno virus)	Anaemia, aplasia of bone marrow, lymphoid depletion, muscle haemorrhage and atrophy of thymus and bursa.	Liver, spleen and buffy coat cells.	Intranuclear inclusions in hepatocytes, indirect HA using liver homogenate	Autologous inactivated vaccine prepared from infected liver suspension treated with formaldehyde.
33	<b>Chicken anaemia agent</b> (Circo virus).	Seen in 3-5 week old broiler chicks. Up to 60% mortality. Accumulation of clear straw coloured fluid in pericardium, swollen, discoloured and friable liver and pale enlarged kidneys with distended tubules	Ailing birds.	Virus isolation in lymphoblastoid cell lines. ELISA and PCR.	
34	<b>Duck plague/ Duck viral enteritis-</b> herpes virus. Ducks and other water fowls.	Sudden, high and persistent mortality - nasal and lachrymal discharges, drooping wings, profuse greenish diarrhoea, swollen sticky eye lids, paralysis of legs, inability to swim in water. Sudden drop in production.	Ailing birds are preferred. Liver, spleen on ice. Pieces of almost all organs in 10% formol saline for HP. Paired serum samples.	Symptoms, virus isolation by duck embryo inoculation. Gross lesions petechie throughout the body	Vaccination 24 day

				<p>particularly heart, serous membranes, oesophageal mucosa, congested ovarian follicles sometimes ruptured - egg peritonitis, haemorrhagic enteritis often with blood in the intestine. Necrosis of gizzard, FAT, Intranuclear inclusion bodies in impression smears</p>	
35	<p><b>Duck hepatitis</b> (Picorna virus)</p>	<p>Infected ducklings stop moving, partially close the eyes, fall on their sides kick spasmodically and die. Soft greenish droppings are seen in some cases. At the time of death the head is usually stretched upwards and backwards</p>	<p>Ailing ducklings are preferred. Blood, liver and spleen on ice through special messenger. Paired serum samples.</p>	<p>Symptoms, inoculation into susceptible day old ducklings. Virus isolation by inoculation into developing chick embryos - PM lesions- enlarged liver which is mottled with haemorrhages, swollen kidney and spleen. VN and FA tests.</p>	

## NON-SPECIFIC DISEASES

Disease	Symptoms	Diagnosis	Control
1	2	3	5
Tympany (Bloat)	Chronic or acute distension of the rumen with gas immediately stops feeding. Respiratory distress, in acute cases, animals fall down in distress and sudden death if immediate relief is not given.	From symptoms, physical examination. In recurrent cases eliminate tuberculosis and foreign body.	Restrict excess feeding
Calf Scour	Diarrhoea associated with poor hygienic conditions leading to enteric infection, overfeeding milk, etc. watery or pasty dung, chalky white or yellowish with streaks of blood and (or) mucus, foul smell. Anorexia, weakness, lethargy, dehydration.	From clinical signs	Proper hygiene
Indigestion	Anorexia, cessation of rumination, feeble rumen motility, distended abdomen, constipation or diarrhoea. In simple indigestion rumen pH. 5.5-7.4. Acid indigestion, rumen pH below 5.5, in addition dehydration, prostration and toxemia. In alkaline indigestion rumen pH more than 7.5.	History, symptoms. Determine the pH of rumen liquor after aspiration with syringe and needle.	Avoid dietary errors such as overfeeding of grains (spoiled cakes/ cattle feeds). Provide sufficient roughage in the rations. Gradual adaption for feed additives like urea.
Bronchitis/ Bronchopneumonia	Frequent cough, off-feed, nasal discharge, fever, respiratory distress.	History and symptoms.	Provide warm bedding. Protect from cold and dusty atmosphere. Avoid drenching.
Milk fever	Muzzle dry, eyes dull, characteristic posture with the neck kinking and head turned towards abdomen, preceded by	History and symptoms	Low calcium high phosphorus diet during pre-partum period. Vit.D

	excitement and tetany.		injection one week before calving as per standard of product used.
Ketosis	Anorexia, sudden and marked reduction in milk yield. Dung hard, pelley and shining. Occasionally nervous symptoms. Secondary ketosis may be associated with mastitis, metritis etc.	History and symptoms. Examination of urine.	Adequate carbohydrate and mineral supplements rich in Vitamins, mild exercise
Downer cow syndrome	Unable to rise following treatment for parturient paresis. Usually animals bright and alert, eat and drinks. Non alert downers are also seen.	Rule out the known causes of recumbency.	Early detection of parturient paresis and adequate treatment with optimum calcium . Proper care at the time of calving.
Navel ill	Pyrexia, swelling at the umbilical region and extending to the joints followed by abscess formation.	Symptoms	Apply antiseptics over the umbilical stump. Hygienic management of new born.
Tail gangrene/ Necrosis	Necrosis of the extremities of tail and in some cases, necrosis of the tip of the ears, muzzle and limbs. Falling of hairs from the switch, separation and shedding of the hooves in some cases. May be dry / moist gangrene. In moist gangrene, the lesions extend upwards.	Symptoms	In early stages avoid feeding of fungus infected straw. Proper curing and staking of straw to prevent fungal growth.
Avitaminosis A	Lachrymation, blindness, general weakness nervous signs like fits, ataxia, congenital deformities	Symptoms	Vitamin A supplements during pregnancy and adequate green fodder to the dam

Luxation of patella	Upward displacement of patella causing dragging of the toe, and lameness for few steps-unilateral or bilateral.	Symptoms	Surgical correction needed
Impaction due to ingestion of rubber latex.	Due to the ingestion of rubber latex, the latex solidified due to the acidity in the rumen. Depending up on the quantity of latex ingested and contents in the abdomen the solidified mass is seen in rumen, reticulum, omasum and abomasum. Impaction of the fore stomach and dyspepsia.	History and symptoms	Avoid access to liquid rubber latex
Heat stroke (pig)	Dyspnoea, salivation open mouth respiration restlessness. Temperature raised to 110° F or higher	Symptoms	Provide shade, wallowing, sprinkler. Avoid overcrowding
Piglet anemia	Due to iron deficiency in the new born. Stunted growth, emaciated, hide bound, severe anemia	Symptoms	Injection of Iron to infant pigs between 3 <sup>rd</sup> and 7 <sup>th</sup> day of age.
Sinus tumour (Ethmoid Carcinoma)	Intermittent nasal discharge initially followed by snoring, protrusion of the eyeballs – unilateral or bilateral, and severe respiratory distress.	Symptoms, cytological examination of nasal discharge	No satisfactory treatment
Aflatoxicosis	Inappetance, retarded growth, reduced feed efficiency. Ruffled feathers, in poultry.	Diagnosed by screening milk, urine and blood of suspected animals.	Sun drying the concentrates for 2-3 hours reduces aflatoxin contamination. Safe level of aflatoxin: Cattle – 50 ppb. Sheep and Goat – 50 ppb. Pigs and Poultry – 20 ppb. Ducks – 10 ppb.

## MYCOTIC DISEASES

Disease, etiological agent and species affected	Important symptoms	Specimens to be collected
1. Dermatophytosis (Species of genera <i>Microsporum</i> , <i>Trichophyton</i> and <i>Epidermophyton</i> ) All warm-blooded animals	May be acute, chronic or sub-clinical, range from slight erythema to highly inflammatory with folliculitis, suppurating body lesions, extensive areas of alopecia and scarring.	Skin scrapings from periphery of lesions
2. Aspergillosis ( <i>Aspergillus fumigatus</i> , <i>A. niger</i> , <i>A. terreus</i> ) All warm-blooded animals	Abortion, fungus ball formation ( <i>Aspergilloma</i> ), Mycotoxicosis following ingestion/inhalation and toxic metabolites. <i>Aspergillus</i> in virtually any organ system or location, with the lung as the most frequent site of primary disease. May be acute or chronic. Acute form in chick - brooder pneumonia. Mastitis.	Impression smears from lungs, trachea, pieces of lung, skin scrapings from cutaneous lesions, milk in mastitis. Placental smears and exudates in abortions.
3. Candidiasis ( <i>Candida albicans</i> , <i>C. tropicalis</i> , <i>C. parapsilosis</i> ) All warm-blooded animals	Thrush in poultry or crop mycosis. Mastitis, abortion, dermatitis, vulvo vaginitis, cystitis, myositis, hepatic dysfunction, intestinal infections in calves.	Skin and mucosal scrapings, impression smears of crop, milk in mastitis, placental smears and exudates in abortions.
4. Rhinosporidiosis ( <i>Rhinosporidium seeberi</i> ) Cattle, horse, camel duck and man	Polypoid or warty lesion of mucus membrane of the nasopharynx. The growth may be soft, friable and pedunculated, blood tinged mucus discharge, epistaxis, dysphagia, and dyspnoea.	Nasal exudates, polypoid growth enucleated from the nasal cavity.



<p>5. Sporotrichosis (<i>Sporothrix schenckii</i>) Equines, Man</p>	<p>Indolent nodules and ulcers, mostly limited to the skin and subcutaneous tissue, sub acute or chronic.</p>	<p>Purulent material collected aseptically from un-opened lesion/exudative material from lesion or tissues.</p>
<p>6. Zygomycosis Members of the family <i>Mucoraceae</i> and the genera <i>Mucor</i>, <i>Absidia</i> and <i>Rhizopus</i>. All warm-blooded animals</p>	<p>Mastitis, abortion, exuberant granulation may be found on ventral abdomen, knee, hock, neck and lips. Extension of the granulation is quite rapid, especially of the legs, lameness.</p>	<p>Scrapings from the mucosal surface or granulomatous lesion. Milk in mastitis. Placental smears and exudates in abortion. Aborted foetus.</p>
<p>7. Blastomycosis. (<i>Blastomyces dermatitidis</i>.) Primates and dogs.</p>	<p>Cutaneous lesions or subcutaneous abscesses. Acute pulmonary disease with productive cough, pleuritic pain, fever, weight loss. Dissemination to other organs may follow, primary to skin, bone and urinogenital tract</p>	<p>Pus from micro abscess, subcutaneous abscess, pleural and peritoneal exudates, spinal fluid, needle biopsy of liver, tracheal exudate.</p>
<p>8. Coccidioidomycosis. (<i>Coccidioides immitis</i>) Primates and dogs</p>	<p>Anorexia, weight loss in acute form. Granulomatous lesion in the lung and thoracic lymph node.</p>	<p>Exudate from the lesion, urine, pleural and peritoneal fluid.</p>
<p>9. Cryptococcosis. (<i>Cryptococcus neoformans</i>.) All warm blooded animals</p>	<p>Causes primary pulmonary lesion, disseminate to the CNS, less often to the skin, bone and other sites. Mastitis, meningitis.</p>	<p>Spinal fluid, milk, urine.</p>
<p>10. Histoplasmosis (<i>H.capsulatum</i>) Dog and man</p>	<p>Most infections asymptomatic or benign and self-limiting. Fever, weight loss, hepatomegaly and splenomegaly with anaemia and leukopenia. Chronic pulmonary infection associated with cough, dyspnoea. Cavities may develop in the apex or sub-apical regions of the lung.</p>	<p>Nodal smears, blood, bone marrow, and lymph node biopsy.</p>

## PARASITIC DISEASES

Sl. No.	Diseases	Samples to be collected	Test to be done
1	Anaplasmosis	1.Blood	1. Agent identification 2, Serology- CFT, Tube agglutination, FAT, Immunoperoxidase test
2	Ehrlichiosis	1.Blood2.Spleen for HP	1. Agent identification 2. Histopathology 3. Serology-IFT,ELISA
3	Babesiosis	Blood	1. Agent identification 2, Serology- Agglutination tests, CFT,IHA,IFAT, ELISA.
4	Theileriosis	Blood	1. Agent identification 2. Clinical Pathology 3. Serology-CFT,HI,AGPT,IFAT
5	Trypanosomiasis	Blood	1. Agent identification 2. Animal inoculation test 3. Serology-CFT, Passive HA, IFAT, ELISA
6	Leishmaniasis	Skin smear or ulcer scraping	1. Agent identification 2. HP (Histo Pathology) 3. FAT (Fluorescent antibody Tech;)
7	Toxoplasmosis	Serum	Serology-Sabin-Feldman dye test, IFAT, CFT, Skin test, IHA
8	Aflatoxicosis	Feed sample 100g	1. Estimation of Aflatoxin by TLC, Aflatoxin by TLC, Aflatoxinometer, HPLC, ELISA

## Highly Pathogenic Avian Influenza (HPAI) Surveillance and control measures

Avian Influenza or Bird Flu is a highly contagious disease of domestic poultry caused by the Influenza Type A virus. Depending on the virulence of the virus the disease may be Low Pathogenic Avian Influenza (LPAI) causing low mortality only in poultry or Highly Pathogenic Avian Influenza (HPAI) with 100% mortality and capable of infecting humans also. Wild birds and migratory water fowls are the natural reservoirs of the virus. H5 and H7 subtypes of the virus are highly pathogenic. The disease is usually manifested with odema of head and neck, cyanosis of comb and wattles, nervous symptoms, greenish diarrhoea, corneal opacity, respiratory distress and finally death.

In the event of an outbreak of HPAI, stringent control and containment measures like culling and disposal of entire birds within 1km radius of the epicentre either by burning/burial thorough disinfection and sanitization of the area along with restriction of bird movement within 10 km radius and post operation surveillance in affected areas are essential.

Fresh stock can be introduced in the area only after rigorous post operation surveillance show negative results. Since HPAI AI V is capable of mutation leading to a pandemic in human being constant routine surveillance in domestic and migratory birds need to be carried out by Animal Husbandry Department in collaboration with Forest Department during migratory season- September to March.

Assessment of State preparedness to combat an outbreak of Highly Pathogenic Avian Influenza (HPAI) should be carried out once in six months. All the vets and paravets should be made aware of and trained in the control and containment activities of HPAI.

### Control Measures

On report of unusual sickness or mortality of poultry other birds or wild birds like crows, parrots, egrets, pigeons, migratory-birds etc. in an area conduct a preliminary investigation immediately.

If Highly Pathogenic Avian Influenza is suspected, collect appropriate samples such as bird carcasses (minimum 5) serum samples from 10 sick birds and cloacal swabs in viral transport medium from 10 healthy birds. These samples, packaged in at least two leak-proof plastic bags and transported inside a polystyrene box containing icepacks, accompanied with appropriate form as per Annexure XIII of Action Plan for Prevention, Control & Containment of Avian Influenza prepared by DADF, Government of India should be despatched through special messenger/ courier to National Institute of High Security Animal Diseases (NIHSAD), Bhopal within 24 hours of initial report.

Control measures for HPAI are classified under 2 headings as per the Action Plan.

1. Steps to be undertaken in Case of Suspicion of Avian influenza Outbreak

## 2. Action Plan to deal with Confirmed Outbreak of AI

Refer : *Action Plan for Prevention, Control & Containment of Avian Influenza (Revised - 2015)*

### SURVEILLANCE

Surveillance for highly pathogenic avian influenza comprises of passive surveillance, active surveillance and targeted surveillance.

#### 1. **Passive surveillance**

Passive surveillance involves immediate reporting of any unusual sickness or mass mortality in poultry and other species of birds in the State by all stake holders like poultry producers, entrepreneur, associations, private veterinary practitioners, community organizations, wild life officials, NGOs participatory groups and Veterinary Institutions. Passive surveillance should be conducted throughout the year.

#### 2. **Active Surveillance (Physical/Clinical surveillance)**

Active surveillance should be conducted during the bird migratory season i.e for six months from September to March. Serum samples/Swab samples/environmental samples/carcass are to be collected and submitted once a month for this surveillance.

#### 3. **Targeted Surveillance:**

Identify the wildlife sanctuaries/ national-parks/ water-bodies visited by migratory/ wild birds along with the buffer zones in each district with the help of Forest department. Collect fresh wet faecal swab samples of wild/ migratory birds from wild birds nesting places and water bodies; serum samples from domestic poultry from buffer zones around national parks, lakes and watershed areas. Samples are to be collected and submitted once a month for six months from September to March with the help of officials of Forest department.

### Sampling Framework

Samples are to be collected from healthy birds and sick birds belonging to commercial bird population of a district, backyard bird population of a district and live bird markets of a district. Categorize the bird population in each district as follows:

- (i) Commercial birds with high density- chickens and ducks
- (ii) Backyard Birds – chickens, ducks, pigeons and other species
- (iii) Live bird markets (LBM) particularly at the border areas

Collect serum samples/Swab samples/environmental samples/carcass from each category as per the sampling frame detailed below once a month for six months from September to March.

#### a. **From Healthy birds**

Collect 6 serum samples per 500 birds from each district limiting the sample size to a maximum of 36 samples irrespective of population size.

**b. From Sick Birds :**

Collect 6 tracheal swabs per 500 birds up to a maximum of 36 samples separately from ducks and poultry

**c. Dead birds : Collect the fresh whole carcasses as such****d. Live bird Markets having less than 2000 birds**

Collect 6 Serum samples from healthy birds, 6 tracheal swabs from poultry, 6 cloacal swabs from ducks and 6 pooled environmental samples (pool size 6) as detailed below:

- a. Drinking water samples
- b. Waste water samples
- c. Faecal dropping samples from cages
- d. Swab samples from Processing tables
- e. Swab samples from Knives

**e. Live bird Markets having more than 2000 birds**

Collect 60 Serum samples from healthy birds, 60 tracheal swabs from poultry, 60 cloacal swabs from ducks & 60 pooled environmental samples as detailed above.

**Targeted Surveillance Sampling Framework**

Forest department should be intimated about the need for collecting samples from wildlife sanctuaries/ national-parks/ water-bodies visited by migratory/ wild birds along with the buffer zones in each district.

- Collect 10 numbers of pooled fresh faecal swab samples (pool size-5) from wild birds.
- Collect 10 numbers of pooled fresh faecal swab samples (pool size-5) from migratory birds.
- Collect 6- 36 serum samples from healthy birds in buffer zones.

The surveillance data collection, analysis, monitoring and reporting data will be compiled, analyzed, monitored, and a report created by the State Veterinary Epidemiology Centre. This report will be in electronic form and be sent every month to: DADF, RDDDL, and Directorate.

Sample collection is to be carried out with the help of Livestock Inspectors by District Epidemiologists. Assistance of supporting staff of Clinical labs attached to DVCs can also be used for this purpose. State Epidemiology Office should ensure that the samples are packed properly as per standard procedure and sent to National Institute of High Security Animal Diseases (NIHSAD), Bhopal as per Annexure IV, by 7th of the following month.

For details refer:

*Action Plan for Prevention, Control & Containment of Avian Influenza (Revised – 2015)*



**MANUAL OF ANIMAL HUSBANDRY DEPARTMENT**

Revised Edition

**CHAPTER - V****VETERINARY JURISPRUDENCE**

- Section 1 Veterinary jurisprudence
- Section 2 Examinations of live animals in criminal cases
- Section 3 Animal welfare board
- Section 4 General duties and instructions to meat inspectors
- Section 5 Detailed instructions for routine inspection on carcasses
- Section 6 Instructions as to additional inspection, where evidence of Tuberculosis has been discovered in cattle and swine.
- Section 7 Instructions -action to be taken in the event of evidence of diseases found in carcasses of Cattle, Goat, Sheep, Horse, swine.
- Section 8 Meat marketing
- Section 9 Transport and handling





## CHAPTER V: VETERINARY JURISPRUDENCE

### SECTION 1

### VETERINARY JURISPRUDENCE

#### General

The application of the principles of human law with reference to veterinary medicine has assumed great importance in recent years. In the matter of administration of justice for the protection of the claims and interest of individuals and groups in an organised society vis-a-vis criminal practices affecting the health and life of animals, the veterinarian is very often called on in evidence as a skilled witness. Whenever he is required to appear in court by subpoena, regularly served for such a purpose, it becomes his bounden duty to accept the summons and appear in court for the purpose of giving professional evidence. In that context as in others he is expected to possess reasonable skill and knowledge of veterinary science and to contribute all authentic information available with him from his personal experience or from authoritative published literature on the subject. In addition he should be fully familiar with all the Acts and rules in force with reference to live-stock improvement, animal diseases, aspects of veterinary public health and other veterinary Acts and rules which may be in force from time to time. In the discharge of his duties as a member of civilized profession his conduct at all times and in all events, has to be above suspicion.

#### Animal Disease—Legislation for Control

Most civilized countries have by law enforced measures for the control of contagious and communicable diseases so that ignorance, prejudice or selfishness of individuals do not prove detrimental to the interests of the society. A representative digest of some of the existing legislations in India against animal diseases is given below:

- (a) **Glanders and Farcy Act** (No. XIII) of 1899.—The provisions of this Act are not restricted to Glanders and Farcy since it covers equine diseases like epizootic, lymph-angitis, Surra and African horse sickness. The authorized agents of the Government under this Act may enter and search any premises suspected to be affected or harbouring the disease and take further action as prescribed, awarding compensation as per rules.
- (b) **Livestock Importation Act** (No. IX) of 1898.—This Act regulates the import of live-stock with reference to the control of animal diseases. The Act as amended in 1944 and 1951 includes almost all domestic animals and their diseases falling within the Scheduled or Notifiable Disease Act like Tickpest, Anthrax, Glanders, Farcy, Scabies, Epizootic lymphangitis, Dourine, Ulcerative lymphangitis, African horse sickness, east coast fever, Contagious bovine pleuro-pneumonia, Tuberculosis, Johne's disease and Bang's disease. Any breach of the Act is punishable with fine which may extend to Rs. 1,000.

(c) **Prevention of Cruelty to Animals Act (Act 59 of 1960).** This Act primarily deals with acts of cruelty to animals. In addition the Act provides also for control of animal disease in some measure, since any person willfully permitting any animal of which he is the owner to go at large in any street while the animal is affected with a contagious disease or, infectious disease without' reasonable excuse permitting any diseased or disabled animal, of which he is the owner, to die in any street, is punishable with a fine which may extend to Rs. 100.

(Refer amendment in Chapter X)

(d) **The Forest Wild Life Act 1972**

The wild life (protection) Act 1972 does not provide for the management of captive elephants, except for the issue of ownership certificates to those who possess the captive elephants and for issuing permits for the transportation of elephants.

The number of captive elephants in the state is increasing, it is necessary to prescribe rules and procedures for the effective and proper management of captive elephants. So to achieve the object, Government has notified necessary rules and procedures vide GO(P)No: 12/2003/F&WLD dated 26/02/2003, Trivandrum.

In exercise the powers conferred by sub-section (1) of section 6 of the Wild life(Protection) Act 1972, The Government of Kerala constituted the state Board for wild life, The Chief Minister as the chair person vide GO(MS)No:77/05/F&WLD, dated 29/07/2005

(Refer amendment in Chapter X)

## CHAPTER V: VETERINARY JURISPRUDENCE

### SECTION-2

#### EXAMINATION OF LIVE ANIMALS IN CRIMINAL CASES

Very often animals are sent to veterinarians by the police or other legal authority with a request for their examination and for expert opinion for evidence of damage likely to have been caused by acts and intents of a criminal nature.

In all such cases any opinion given in writing should have been arrived at by a careful and complete clinical examination and study of the nature of the injuries or other evidences manifested by the patient as against opinions based on evidences of a circumstantial nature or on hearsay evidence.

A careful record of the following details should be noted at the time of examination: -

1. Time, date and place of examination.
2. Reference to communications received with the animal giving details of name, designation, etc., of the person accompanying it
3. Complete description of the animal for purposes of identification.
4. Findings.
5. Opinion.

A separate register should be maintained for this purpose and the same kept under lock and key. Only excerpts from such records maintained may be given for the communication of any specific opinion.

Common offences against animals are-

- (a) Malicious destruction, poisoning or maiming.
- (b) Acts of cruelty.
- (c) Bestiality.

#### **(a) Malicious (Mischief ) destruction**

Under section 423 I.P.C. acts of mischief like killing, poisoning, maiming or rendering useless any animal or animals of the value of Rs. 10 and upwards are punishable with imprisonment of either description for a term which may extend to 2 years or with fine or both.

Under section 429 I. P. C. acts of mischief by killing, maiming, poisoning or rendering use-less any elephant, camel, horse, mule, buffalo, cow or ox whatever may the value

thereof or any other animal of the value of Rs. 50 and above shall be punishable with imprisonment of either description for a term of 5 years or with fine or both.

*Maiming* or the use of violence, which renders an animal useless, is a common crime. It is often committed to gratify spite against a neighbour or other person, or out of anger or resentment, for damages to crops or other property caused by trespass. Watchdogs are killed or maimed with criminal intention of committing thefts etc. Sometimes such damages are caused by accidents of a culpable nature.

Terms such as simple hurt and grievous hurt as applied in medico legal language are not usually applied with reference to animals. Instead the veterinarian may be required to state whether the damage inflicted was of a serious nature, enough to maim an animal or likely to bring about its death in cases where death has actually not resulted. Some common forms of hurt, which render animals useless or are likely to lead to such results are-

- (1) Fractures of bones including horns.
- (2) Cutting of tendons and ligaments particularly of the legs and neck.
- (3) Dislocation or opening of joints.
- (4) Injuries to the eyeball leading to blindness of one or both eyes.
- (5) Injuries to the udder of milch animals.
- (6) Laceration or rupture of rectum and vagina.
- (7) Punctured or gaping wounds of the abdomen and the thorax.

Valuable security like the presence of a bullet or a broken blade of knife or dagger or any other foreign body found *in situ* should be described in specific detail and it safely preserved for use as an exhibit in evidence, unless it was sent in a sealed cover to a legal authority or the police, for which a receipt should have been obtained in writing.

### **(b) Acts of Cruelty**

Cases of cruelty to animals for material benefit or for sadistic reasons are punishable with fine up to Rs. 100 or imprisonment for 3 months under the Cruelty to Animals Act (No. XI of 1890). The crime may consist of severe beating, overloading, overdriving, and causing sick animals to be put to work, placing cruel restrictions on space or liberty for movement, either generally or in transit of an animal or group of animals, are all actions punishable under this Act. Besides starving of animals from food, air or water, cruel practices like "phooka", etc., are also punishable. Such animals are liable to be seized and removed from their owners and remanded under safe custody for treatment, if any required, at Government infirmaries for animals, pending trial and award of penalties as prescribed under law. All expenditure in the meanwhile for feeding, etc., will be recoverable from the respective owners of animals remanded.

### **(C) Bestiality**

This crime would appear to be of a fairly frequent occurrence. A human male is generally the active partner in this crime. His victims generally are does, jennies, cows

and even hens. Whoever voluntarily has carnal intercourse against the order of nature with any man, woman or animal shall be punishable for life or with imprisonment of either description for a term which may extend to 10 years, with or without fine.

### **Necroscopy vis-a-vis Criminal Investigation**

The Veterinarian is often requisitioned in writing to examine carcasses of animals alleged to have been killed by violence, poisoning, etc., of maleficent character. A common motive in villages is to obtain hides of fallen carcasses and sometimes it is in gratification of spite against neighbours or others.

To determine the cause and the manner of death in all such cases, the veterinary surgeon would have to depend on his own education and experience in the profession. In any case of doubt he should not hesitate to obtain more expert advice before coming to any conclusion.

Details about the date, time and place of such examination should be recorded. A post mortem examination if conducted at the place and on the spot of the occurrence of death, note should be taken of all findings regarding the position and posture of the carcass and its surroundings. Any history or information available about the incidence of disease prior to death or other related information, if any, regarding the cause and nature of death should be incorporated as such in the report, citing the source from which such information was gathered in specific detail. Findings about the state of body heat, presence or otherwise of rigor -mortis, onset and state of post-mortem decomposition, details of surface, bodily injuries, bruises, etc., should all be noted down. All other findings on autopsy should be recorded then and there in the original report.

All materials including organs or viscera for Chemico-legal examination as required should be collected, safely packed, sealed and forwarded under police custody to the Government Analyst/Chemical Examiner for favour of specific examination and report.

### **Chemico-legal Cases and Requirements**

The Veterinary Surgeons in charge of Veterinary Institutions should maintain sufficient stock of chemicals and appliances as listed below, for the transmission of materials to the Chemical Examiner to the Government:

<b>Sl No</b>	<b>Item</b>	<b>Quantity</b>
1	Rectified spirit/ saturated saline	As per requirement
2	Big jars wide mouthed	2.5 L
3	Big jars wide mouthed	5 L
4	Big jars wide mouthed	10 L
5	Corks and bungs for the above	As per requirement
6	Bottles wide mouthed	50 ml

7	Bottles wide mouthed	250 ml
8	Bottles wide mouthed	500 ml
9	Bottles wide mouthed	1L
10	Bottles wide mouthed	2 L

All preservative or other chemicals added should be specified and samples of same sent in sealed containers, to the Chemical Examiner along with the written requisition for examination and a copy of post mortem report

### Sample collection in Vetro- legal Cases

The Veterinarian is often requisitioned in writing to examine carcasses of animals alleged to have been killed by violence, poisoning, etc. Such cases should be accepted by a Veterinarian if only they are accompanied by an official request from a police officer not below the rank of Sub Inspector. Care should be taken to record in the certificate issued the identity of the Police Officer who produces the object (Carcass/ live animal) of examination.

Sample collection procedures in Vetro-legal cases are:

- Record the date, time and place of examination.
- Record the position and posture of the carcass and its surroundings.
- Record any history or information available about the incidence of disease prior to death or any other information regarding the cause and nature of death. citing the source from which such information was gathered in specific detail.
- Record findings about the state of body heat, presence or absence of rigor -mortis, onset and state of post-mortem decomposition, details of surface, bodily injuries, bruises, etc.
- Record all other findings on autopsy.
- Collect materials including organs or viscera for Chemico-legal examination. These samples should be safely packed, labeled, sealed and forwarded under police custody to the Government Analyst/Chemical Examiner for favour of specific examination and report
- All preservative or other chemicals added should be specified and samples of same sent in sealed containers, to the Chemical Examiner along with the written requisition for examination and report

### Materials for Examination

#### 1. The following materials are to be sent for examination in cases where expertopinion of the Chemical Examiner to Government is sought:-

- (a) About 1 kg of the contents of the stomach in a clean glass or well glazed earthen vessel/vessels with the addition of sufficient quantity of rectified spirit /saturated saline as preservative.

- (b) About 1 kg of stomach wall in a clean glass or well glazed earthen vessel/vessels with the addition of sufficient quantity of rectified spirit as preservative.
- (c) About 1/2 kg of contents of the intestines in a clean glass or well glazed earthen vessel/vessels with the addition of sufficient quantity of rectified spirit as preservative.
- (d) About 1/2 kg of liver and kidney in a clean glass or well glazed earthen vessel/vessels with the addition of sufficient quantity of rectified spirit as preservative.
- (e) Dry dung without the addition of the spirit.
- (f) Sample of the poison or other material reported to have been used if obtained.
- (g) At least 100 ml of the sample of the preservative used for preserving the materials.

*Note:- (i) Care should be taken to use rectified spirit or super saturated saline solution only.*

*(ii) The amount of spirit added to each vessel should be measured and the quantity so added should be written on the label affixed to the vessel over and above the weight of material sent.*

2. All bottles and packets should be carefully sealed by the Veterinary Surgeon himself and sealed in such a manner that the contents cannot be tampered with. The seal used should be kept under safe custody. Each packet or bottle should bear the number and the date of the letter of advice to the Chemical Examiner relating to the case, as well as a short description of the nature and the quantity of the contents, under the signature of the veterinary officer concerned.
3. Suspected materials may be forwarded through a con-stable if possible. The parcel should be safely packed, labelled and sealed. Bottles containing viscera, etc., should be wrapped in cloth or paper to prevent spillage
4. When an officer forwards materials for Chemico-legal purposes he should at the same time forward a letter by separate post to the Chemical Examiner advising the dispatch of materials. This letter should contain-
  - (1) Full details of the purpose for which the analysis is required.
  - (2) Particulars of the case whatever its nature may be.
  - (3) A true impression of the seal used in sealing the contents and a description of it in words.
  - (4) A list of articles forwarded "with information as to how the articles have been forwarded and the numbers given to the articles in the list corresponding with the number of the labels.
  - (5) The name of the officer of law from whom a requisition has been received to forward the articles and the number and date of such order.
  - (6) Information as to the number and kind of animals affected and the number of deaths if relevant, and any information obtainable "as to post-mortem appearances and nature and duration of ailment and symptoms shown which

may give an indication of the nature of the substance used in the case under reference.

### **Common Frauds in the Sale of Livestock and Livestock Products**

The Veterinarian is sometimes required to check the marks of identification of an animal for issue of identification certificates in case of fraudulent sale or other transactions. It is essential to see that great care is taken to check on the correct age, colour and markings of the animal in all such cases, after a complete and proper examination.

In certain cases diseased animals are sold as healthy and sound for certain specified purposes of utility. The Veterinarian may be required to examine such cases and offer strictly professional advice. Such duties call for considerable skill, application and integrity and are such as shall not be disposed of lightly.

### **Insurance**

Livestock Insurance for specific purposes and for particular periods in transit or otherwise is becoming more and more popular. It is a regular feature with reference to valuable racehorses. The responsibility of the Veterinarian for the issue of health certificates in all such cases is very great and on no occasion should a certificate cognizant be issued by any Veterinary Surgeon without a complete and proper examination. Any default or indifference shown in such duties and functions shall be treated as neglect of duty and would amount to serious professional misconduct with its accompanying consequences.

*(Refer GO. (MS) No.119/2014/AD dated, Thiruvananthapuram, 03.06.2014 for Reconstitution of Kerala State Animal Welfare Board)*



## CHAPTER V: VETERINARY JURISPRUDENCE

### SECTION-3

### ANIMAL WELFARE BOARD

#### 1. Establishment of Animal Welfare Board:-

- (1) For the promotion of animal welfare generally and for the purpose of protecting animals from being subjected to unnecessary pain or suffering, in particular, there shall be established by the Central Government, as soon as may be after the commencement of this Act, a Board to be called the Animal Welfare Board.
- (2) The Board shall be a body corporate having perpetual succession and a common seal with power, subject to the provisions of this Act, to acquire, hold and dispose of property and may be its name sue and be sued.

#### 2. Constitution of the Board.

(1) The Board shall consist of the following persons, namely:-

- (a) The Inspector General of Forests, Government of India, ex-officio;
- (b) The Animal Husbandry Commissioner to the Government of India, ex-officio;
- (c) One person to represent such association of veterinary practitioners as in the opinion of the Central Government ought to be represented on the Board, to be elected by that association in the prescribed manner;
- (d) Two persons to represent practitioners of modern and indigenous systems of medicine, to be nominated by the Central Government;
- (e) One person to represent each of the municipal corporations of Bombay, Calcutta, Delhi and Madras, and one person to represent any other municipal corporation as, in the opinion of the Central Government, ought to be represented on the Board, to be elected by each of the said corporations in the prescribed manner;
- (f) One person to represent each of such three organisations actively interested in animal welfare as in the opinion of the Central Government ought to be represented on the Board, to be chosen by each of the said organisations in the prescribed manner;
- (g) One person to represent each of such three societies dealing with prevention of cruelty to animals as in the opinion of the Central Government ought to be represented on the Board, to be chosen in the prescribed manner;
- (h) Three persons to be nominated by the Central Government;

- (i) Six members of parliament, four to be elected by the House of the People (Lok Sabha) and two by the Council of States (Rajya Sabha).
  - a) Any of the persons referred to in clause (a) or clause (b) of sub-section (1) may depute any other person to attend any of the meetings of the Board.
  - b) One of the members of the Board shall be nominated by the Central Government to be its Chairman.

### **3. Term of office and conditions of service of members of the Board-**

- (1) Save as otherwise provided in this section, the term of office of a member of the Board shall be three years.
- (2) Subject to the provisions contained in sub-section (4) the term of office of the member elected to represent any municipal corporation (other than the corporation of Bombay, Calcutta, Delhi and Madras) shall be one year from the date on which such member assumes office.
- (3) The term of office of an ex-officio member shall continue so long as he holds the office by virtue of which he is such member..
- (4) The term of office of a member elected or chosen under clause (c), clause (e), clause (f), clause (g), or clause (i), of section 5 to represent any body of persons shall come to an end as soon as he ceases to be a member of the body which elected him or in respect of which he was chosen.
- (5) The term of office of a member nominated, elected or chosen to fill a casual vacancy shall continue for the remainder of the term of office of the member in whose place he is nominated, elected or chosen.
- (6) The members of the Board shall receive such allowances, if any, as the Board may subject to the previous approval of the Central Government, provide by regulations made by it in this behalf.
- (7) No act done or proceeding taken by the Board shall be questioned on the ground merely of the existence of any vacancy in, or defect in the constitution of the Board.

### **4. Secretary and other employees of the Board-**

- (1) The Central Government shall appoint one of its officers to be the Secretary of the Board.
- (2) Subject to such rules as may be made by the Central Government in this behalf, the Board may appoint such number of other officers and employees as may be necessary for the exercise of its powers and the discharge of its functions and may determine the terms and conditions of service of such officers and other employees by regulations made by it with the previous approval of the Central Government.

### **5. Funds of the Board**

The funds of the Board shall consist of grants made to it from time to time by the Government and of contributions, donations, subscriptions, bequests, gifts, and the like made to it by any local authority or by any other person.

### **6. Functions of the Board.**

The functions of the Board shall be-

- (a) To keep the law in force in India for the prevention of cruelty to animals under constant study and advise the Government on the amendments to be undertaken in any such law from time to time;
- (b) to advise the Central Government on the making of rules under this Act with a view to preventing unnecessary pain or suffering to animals generally, and more particularly when they are being transported from one place to another or when they are used as performing animals or when they are kept in captivity or confinement;
- (c) to advise the Government or any local authority or other person on improvements in the design of vehicles so as to lessen the burden on draught animals;
- (d) to take all such steps as the Board may think fit for ameliorating the condition of beasts of burden by encouraging, or providing for the construction of sheds, water troughs and the like and by providing for veterinary assistance to animals;
- (e) to advise the Government or any local authority or other person in the design of slaughter-houses or in the maintenance of slaughter-houses or in connection with slaughter of animals so that unnecessary pain or suffering, whether physical or mental, is eliminated in the pre-slaughter stages as far as possible, and animals are killed, wherever necessary, in as humane a manner as possible;
- (f) to take all such steps as the Board may think fit to ensure that unwanted animals are destroyed by local authorities, whenever it is necessary to do so, either instantaneously or after being rendered insensible to pain or suffering ;
- (g) to encourage, by the grant of financial assistance or other-wise, the formation of pinjrapoles, sanctuaries and the like where animals and birds may find a shelter when they have become old and useless or when they need protection;
- (h) to cooperate with, and coordinate the work of, associations or bodies established for the purpose of preventing unnecessary pain or suffering to animals or for the protection of animals and birds ;
- (i) to give financial and other assistance to animal welfare organizations functioning in any local area or to encourage the formation of animal welfare organizations in any local area which shall work under the general supervision and guidance of the Board;
- (j) to advise the Government on matters relating to the medical care and attention which may be provided in animal hospitals and to give financial and other assistance to animal hospitals wherever the Board thinks it necessary to do so ;
- (k) to impart education in relation to the humane treatment of animals and to encourage the formation of public opinion against the infliction of unnecessary pain or suffering to animals and for the promotion of animal and welfare by means of lectures, books, posters, cinematographic exhibitions and the like;
- (l) to advise the Government on any matter connected with animal welfare or the prevention of infliction of unnecessary pain or suffering on animals.

### **1. Power of Board to make regulations**

The Board may, subject to the previous approval of the Government, make such regulations as it may think fit for the administration of its affairs and for carrying out its functions

## CHAPTER V : VETERINARY JURISPRUDENCE

### SECTION 4

#### GENERAL DUTIES AND INSTRUCTIONS TO MEAT INSPECTORS

1. It shall be the duty of the Meat Inspectors appointed by the local authority in this behalf:
  - (a) to attend at the slaughter house during the hours fixed
  - (b) to inspect animals ante-mortem according to the provisions in Part VII of these rules
  - (c) to keep a record of the number and kind of animals slaughtered along with the number of kind of carcasses, parts and organs condemned for different diseases;
  - (d) at the close of each day's work to see that the slaughter house or slaughter houses under him are thoroughly cleansed and disinfected and the condemned parts and organs duly destroyed and the offal removed to such places as may be appointed by the local authority
  - (e) and generally to enforce the provisions of these rules.
2. Every effort shall be made to inspect the carcasses and viscera of all animals slaughtered. This examination shall be methodical and as complete as possible in all cases.
3. *(a)* The Meat Inspector shall have his own knives, wipes and instruments for examining carcasses and parts and organs thereof.  
*(b)* Knives and other instruments that have been used for cutting or examining any diseased organ, gland or tissue shall not again be used for any purpose until they have been disinfected in boiling water or other suitable disinfectant.
4. The carcass of an animal that is free from disease and the carcasses and organs which are well nourished shall be passed without any undue mutilation as fit for human consumption.
5. When ill portions unfit for human food have been removed from a carcass is under the supervision of a Meat Inspector, the remainder of the carcass shall be passed as fit for human consumption.
6. If disease is found in any part of carcass or in any organ the whole carcass and all the organs thereof shall be examined for evidence of any repetition of the local condition or modification of the same in other parts.

### **Ante-mortem Inspection**

Wherever practicable it is desirable that all animals shall be inspected before slaughter the object being to ascertain that each animal which it is intended to slaughter is in a satisfactory state of health. In cases of doubts as to the health of the animal the Meat Inspector shall notify the Veterinary Surgeon. Where ante-mortem inspection of animals is not possible or has not taken place the butcher shall notify the Veterinary Surgeon or the Meat Inspector, in any case in which he has doubt as to the health of the animal. Immediate steps shall be taken to have the animal examined before slaughter.

1. Such ante-mortem examination shall be made on the premises of the slaughter houses in which the animals are about to be slaughtered and should include:
  - (a) Examination for evidence of cruelty to animals by over-trucking, overdriving or by other act.
  - (b) Examination for the detection of animals in very emaciated condition or affected with disease in any form.
2. All stock showing signs of pregnancy shall be rejected and removed from the slaughterhouse after being marked with some distinguishing mark.
3. No animals with wound at foot shall be permitted to be slaughtered.
4. No stock in a febrile condition shall be slaughtered for human consumption in any slaughtering place.
5. No stock showing ante-mortem symptom, of disease or suspected of being diseased shall be slaughtered, until all other stock intended to be slaughtered at the slaughter house on the same day have been slaughtered.

**Method of Examination of Carcasses** – The following instructions indicate the order and method of inspection of all carcasses-

#### **General principles to be observed**

##### **1. Viscera**

- (a) All viscera shall be examined as they are removed from the carcass or in such circumstances or as will ensure that they are the viscera of a particular carcass.
- (b) Every organ and the associated lymph glands shall be examined by the eye and by palpation. When any abnormal condition is observed, the nature and significance of which cannot be determined by such examination, the organ or gland shall be incised and the incision shall be made in such manner as to avoid soiling or contamination or unnecessarily depreciating the value of any part of the carcass or other organs that may be passed fit for human food.
- (c) The efficient examination of lymph gland; shall be by multiple incisions into their substance.

**2. Carcass** - The carcass shall be examined for-

- (a) evidence of bruising, haemorrhage or discolouration (b) local and general dropsy (oedema), (c) Swelling or deformities of bones or joints or swelling or other abnormality in the musculature.
- (b) The serous membranes (pleura and peritoneum) shall be examined in every case, and in no case shall they be removed nor shall any evidence of disease be modified or obliterated by washing, rubbing and stripling or in any other manner before examination.
- (c) After the carcass is split the sternum, ribs, vertebrae and spinal cord shall be examined.
- (d) Incision to be made on each quarter in the musculature near the shoulder points and near the public bone, without mutilating the carcass, for detection of cysts (*Cysticercus bovis and cellulosae*).

## CHAPTER V: VETERINARY JURISPRUDENCE

### SECTION 5

#### DETAILED INSTRUCTIONS FOR ROUTINE INSPECTION ON CARCASSES

##### A. Carcasses of Cattle and Swine

###### 1. Head

The head including (a) the surface and substance of the tongue (which should be loosened but not detached before examination) (b) the palate or roof of the mouth, and (c) the lymph glands of the throat (retropharyngeal, sub-maxillary and parotid) shall be examined by the eye and palpation and cheek muscles shall be examined on both sides by a linear incision parallel with the braches of the lower jaw.

*Note: In the case of calves, lymph gland of the head shall only be cut in cases of suspicion.*

###### 2. Abdominal cavity

###### (a) Stomach - Intestines and spleen

The outer and when necessary the inner, surfaces of the stomach and intestines, and the surface and substance of the spleen shall be examined, together with the glands of the stomach and bowel (gastro-splenic and mesenteric) and the web (omentum). The spleen shall be cut where necessary, for the examination of the substance (pulp).

###### (b) Liver

The surfaces and substance of the liver shall be examined. The "associated lymph glands (hepatic) shall also be examined and the bile ducts incised where necessary.

*Note: In the case of calves, the cutting of bile duct may be omitted.*

###### (C) Kidneys

The lymph glands of the kidneys (renal) and the adrenal glands shall be examined before the removal of the kidneys. Thereafter the kidneys shall be exposed and the surface examined and if necessary the kidneys shall be split by incision and the substance examined.

**(d) Uterus and Ovaries**

The inner and outer surfaces of the uterus and the substance of the ovaries shall be examined. Where necessary the uterus shall be cut transversely through both horns and also longitudinally.

**(b) Urinary bladder**

The outer and inner surfaces of the urinary bladder shall be examined by observation and by cutting only if it shows a diseased condition.

*Note.*—In reporting upon regions included in paragraph 2 (a), 2 (b) and 2 (d) special attention shall be paid as to whether the lesions affect the peritoneal surface or the organ itself. Unless care in this connection is evinced statistical records became misleading.

**3. Thoracic cavity**

The contents of the thoracic cavity shall be examined before the various organs are separated from each other and the following examination shall be made —

**(a) Lungs**—The lungs shall be examined by the eye by palpation and unless obviously diseased they shall be incised at the base. The associated lymph glands (bronchial and mediastinal) shall also be examined and unless obviously diseased shall be incised.

*Note:* In reporting upon lesions included in paragraph 3 (a) distinction shall be made between lesion affecting the pleura and those affecting the lung parenchyma.

**(b) Heart**—The heart sac (pericardium) shall be opened and the heart examined and if necessary incised.

*Note:* In reporting upon lesions in paragraph 3 (b) distinction shall be made between lesions of the pericardium, myocardium and endocardium.

**4. Udder**

The udder shall be examined by observation and palpation incisions shall be made at the base of the teats, and also into any indurated region in the substance of the gland the associated lymph glands (supra-mammary) shall also be incised.

**5. Testicles and penis**

The outer surface and the substance of the testicles and the penis and the superficial lymph glands shall be examined.

**6. Serous membranes**

The lining (serous) membranes of the chest and abdomen (pleura and peritoneum) shall be examined in every case.

*Note:*- 1. It will be observed that in all cases the following lymph glands must, be examined as a matter of routine, viz., (1) retropharyngeal (in bovines) and sub-maxillary



(in swine), (2) bronchial and mediastinal, (3) hepatic and (4) mesenteric. In the case of a calf, special attention shall be paid to the navel and to the joints of the carcass.

#### **B- Carcasses of Sheep and Goats**

The examination is conducted on the same lines as for calves in Section II. The cutting of the heart, head, pulmonary lymph glands and pulmonary lymph glands shall be undertaken only in cases of suspicion.

#### **C - Carcasses of Horses, Mules and Donkeys**

The inspection is conducted on the same lines as for cattle in Section II but a thorough examination of the nasal mucous membranes shall be made and the head split up longitudinally, and the septum nasii taken out in every case.

## CHAPTER V: VETERINARY JURISPRUDENCE

### SECTION 6

#### A-INSTRUCTIONS AS TO ADDITIONAL INSPECTION WHERE EVIDENCE OF TUBERCULOSIS HAS BEEN DISCOVERED IN CATTLE AND SWINE

Where, as a result of inspection in accordance with Section II evidence of tuberculosis has been detected, the carcass and viscera shall be examined in accordance with the following instructions:-

1. The viscera and the associated lymph glands shall be examined for evidence of tuberculosis both in the substance and in the covering membranes (capsules). The existence of tuberculosis in the lymph gland of an organ shall be held to be evidence of the disease in the organ.
2. All the usual lymph glands which are examined in meat inspection work (other than those already enumerated), viz., the lower cervical, pre-sternal, sub-dorsal, pre-scapular, supra-mammary (or superficial inguinal), iliac and sub lumbar glands; and if considered necessary the precrural and popliteal glands shall be exposed and examined by incision in every case of tubercle. Those glands which, having regard to visible evidence, are least likely to be infected shall be examined first, e.g., if evidence to tuberculosis is found on the pleura the glands of the hind-quarter shall be examined before those of the fore-quarter.
3. The carcass of a pig in which lesions of tuberculosis are found in any situation or in any degree shall be split and the vertebrae examined. The kidneys in such a carcass shall be freed, but not necessarily detached from the enclosing fatty tissue, the surface shall be carefully examined, and if lesions are obvious or suspected, incisions shall be made into the substance.

#### **B-Instructions as to the Action to be taken in the Event of Evidence of Tuberculosis in Cattle and Swine**

- A. Organs:** An organ shall be seized when tuberculosis exists on its capsule, or in its substance, or in the associate lymph glands.

- B. Head:** The head, including tongue, shall be seized if any of the lymphatic glands of the head are affected.
- C. Carcass:** The entire carcass and organs and parts thereof shall be seized when the following conditions are found :
  - (a) Tuberculosis with emaciation.
  - (b) Generalized tuberculosis.

*Note:*—In determining whether the disease is generalized, the judgment shall be based on the sum of the evidence of disease through-out the entire carcass and organs. The following conditions shall be regarded as evidence of generalization.

#### **(i) Miliary Tuberculosis of both lungs**

*Note.*—This is subject to the following qualifications.

In minor instances of miliary tuberculosis of the lungs, **without evidence of tuberculosis elsewhere and provided the miliary tuberculosis are not numerous and not of recent origin**, it may be possible to pass the carcass. But miliary tuberculosis in the lung even in such a case is evidence of previous systemic infection, and the decision as to whether such a carcass should be condemned shall devolve upon the Veterinary Surgeon or the Medical Officer of Health.

1. Where lesions are multiple, acute and actively progressive.
2. Where there is multiple and widespread infection of the carcass lymph glands.
3. Where there are diffuse acute of both serous membranes (pleura and peritoneum) and any of the carcass lymph glands are enlarged or contain visible tuberculous lesions.
4. Where, in addition to the presence of tuberculosis lesion in the respiratory or digestive tracts, there are also lesions present in the substance of any of the following: spleen, kidney, udder or uterus or ovary, testicle, brain and spinal cord or their membranes.

*Note — Notwithstanding this instruction instances may be found where it would be justifiable to pass the carcass after condemnation of the affected organ. Absence of signs of activity, such as calcification or definite capsulation would be favourable indications. The decision as to whether such a carcass should be condemned shall devolve upon the Veterinary Surgeon or the Medical Officer of Health.*

#### **(ii) Congenital tuberculosis in calves**

1. All cases of tuberculosis not included in the immediately foregoing instructions shall be regarded and treated as localized lesions and the parts containing the lesions and contiguous thereto shall be condemned.
2. If an organ or portion of a carcass becomes contaminated by tuberculosis material, it shall be treated as if it were a case of localized tuberculosis.

**CHAPTER V: VETERINARY JURISPRUDENCE****SECTION 7****INSTRUCTIONS AS TO THE ACTION TO BE TAKEN IN THE EVENT OF EVIDENCE OF OTHER DISEASE BEING FOUND IN CARCASSES OF CATTLE, SHEEP, GOATS OR HORSES OR SWINE**

- A.** The entire carcass and all the parts and organs and also the blood thereof, shall be condemned and seized if evidence of any of the following conditions is found :-
1. Actinomycosis (generalized)
  2. Anaemia (if pronounced)
  3. Anthrax
  4. Blackleg
  5. Bruising, general, extensive and severe, with or without gangrene
  6. Cysticercus bovis (measly beef) if generalized in the meat substance
  7. Cysticercus cellulosae (measly pork), if generalized in the meat substance
  8. Decomposition (general)
  9. Dourine
  10. Dropsy (general)
  11. Emaciation, general, pathological (associated with disease)
  12. Epizootic lymphangitis
  13. Erysipelas, acute swine
  14. Fever (acute)
  15. Foot and mouth disease (acute)
  16. Glanders (or Farcy)
  17. Haemorrhagic Septicaemia
  18. Immaturity, stillborn or unborn carcasses
  19. Jaundice (pronounced)
  20. Johne's disease (accompanied by emaciation or anaemia)
  21. Lymphadenitis, caseous

22. Malignant catarrhal fever
23. Malignant neoplasms—unless localized, in situation and effect, to one organ
24. Melanosis, generalized or any generalized pigmentation
25. Mammitis, acute and septic
26. Metritis, acute and septic
27. Parturition (carcasses of animals having given birth to young within 7 days)
28. Pericarditis, septic
29. Pneumonia, gangrenous
30. Pyaemia, including joint-ill or umbilical pyaemia
31. Rabies
32. Rickets with malnutrition
33. Rinderpest
34. Sarcocysts, if generalized in the musculature and visible to the naked eye
35. Septicaemia or septic intoxication
36. Swine fever
37. Surra
38. Tetanus
39. Trichinosis
40. Tumors, multiple in musculature
41. Uraemia (a carcass having a urinous odour)

*Note.- A carcass shall be considered too immature to produce whole-some meat if-*

- (a) *the meat has the appearance of being water-soaked, is loose, flabby, tear easily or*
- (b) *can be perforated with the fingers or*
  - (a) *its colour is greyish red or*
  - (b) *good muscular development as a whole is lacking, especially noticeable on the upper shank of the leg, where small amounts of serous infiltrates of small oedematous patches are sometimes present between the muscles; or*
- (c) *The tissue which later develops as the fat capsule of the kidneys is oedematous, dirty, yellow or greyish, red, tough and intermixed with islands of fat.*

- B.** In all cases in which evidence of disease not enumerated in Section VII-A above is found, the organ or portion of the carcass or portions of the carcass affected by the disease and the organs or portions contiguous thereto, shall be condemned.
- C.** Flesh or organs or carcasses falling under one or more of the (Mowing conditions which render them unwholesome, unsound or otherwise unfit for human consumption, shall be condemned:-

1. Conditions caused by animal parasites (resident in edible parts) that are pathogenic to the human subject
2. Diseased conditions caused by bacteria which are pathogenic to the human subject
3. The presence of poisonous substances in the flesh. Such poisons may be (i) bacterial poisons or toxins generated in the living body by pathogenic bacteria, or produced post-mortem by putrefactive bacteria, or (ii) mineral or vegetable poisons introduced into the living animal or added to the flesh as a preservative after death.
4. Structural alterations that render the flesh organs or the carcass unsightly or otherwise repulsive in appearance.
5. Conditions that render the flesh innutritious.