

Instructions

Practical on Laboratory Diagnostics 11th semester

1. Rules of sending samples to a laboratory (including packing, cover letter). Special sampling of notifiable diseases for laboratory diagnostics.

- Importance of infectious diseases in farm and companion animals.
- Factors influencing spreading and losses of infectious diseases.
- Indication of laboratory examinations.
- Steps of diagnosis.
- Databases regarding epidemiology of infectious diseases.
- Sampling for laboratory examinations and sending samples to the laboratory.

2. Post mortem examination of mammals, sampling for laboratory examinations.

- Gross pathological examinations of different mammal species.
- Rules of sampling for histological examinations including fixations.
- Application of the most important staining methods in the diagnostic work.
- Collection of histological samples from live animals, its importance in the diagnostic of tumours.
- Immunohistochemical methods and their role in the diagnosis of infectious and non infectious diseases.
- Rules of writing official reports on post mortem examinations.

3. Post mortem examination of birds, sampling for laboratory examinations.

- Post mortem examination of adult birds.
- Examination of dud eggs, its importance in the diagnosis.
- Important lesions indicating metabolic disorders in poultry species.
- Post mortem examination of day old chickens, lesions of the most important diseases affecting the flocks.
- Differential diagnosis of infectious diseases of poultry with lymphoproliferative tumours.
- Differential diagnosis of diseases of birds with immunosuppression.

4. Diagnosis of the most important infectious diseases of cattle

- Diagnosis of notifiable diseases of cattle.
- Diagnosis of generalized diseases of cattle with fever.
- Diagnosis of infectious diseases of cattle with gastrointestinal signs.
- Diagnosis of infectious diseases of cattle with respiratory signs.
- Diagnosis of infectious diseases of cattle with central nervous signs.
- Diagnosis of infectious diseases of cattle with abortion.

5. Diagnosis of the most important infectious diseases of sheep and goats

- Diagnosis of notifiable diseases of sheep and goats.
- Diagnosis of generalized diseases of sheep and goats with fever.
- Diagnosis of infectious diseases of sheep and goats with gastrointestinal signs.
- Diagnosis of infectious diseases of sheep and goats with respiratory signs.

- Diagnosis of infectious diseases of sheep and goats with central nervous signs.
- Diagnosis of infectious diseases of sheep and goats with abortion.

6. Diagnosis of the most important infectious diseases of swine

- Diagnosis of notifiable diseases of swine.
- Diagnosis of generalized diseases of swine with fever.
- Diagnosis of infectious diseases of swine with gastrointestinal signs.
- Diagnosis of infectious diseases of swine with respiratory signs.
- Diagnosis of infectious diseases of swine with central nervous signs.
- Diagnosis of infectious diseases of swine with abortion.

7. Diagnosis of the most important infectious diseases of horses

- Diagnosis of notifiable diseases of horses.
- Diagnosis of generalized diseases of horses.
- Diagnosis of infectious diseases of horses with gastrointestinal signs.
- Diagnosis of infectious diseases of horses with respiratory signs.
- Diagnosis of infectious diseases of horses with central nervous signs.
- Diagnosis of infectious diseases of horses with abortion.

8. Diagnosis of the most important infectious diseases of dogs and cats

- Diagnosis of notifiable diseases of dogs and cats.
- Diagnosis of generalized diseases of dogs and cats.
- Diagnosis of infectious diseases of dogs and cats with gastrointestinal signs.
- Diagnosis of infectious diseases of dogs and cats with respiratory signs.
- Diagnosis of infectious diseases of dogs and cats with central nervous signs.
- Diagnosis of infectious diseases of dogs and cats with abortion.

9. Diagnosis of the most important infectious diseases of poultry

- Diagnosis of notifiable diseases of poultry.
- Diagnosis of generalized diseases of poultry.
- Diagnosis of infectious diseases of poultry with gastrointestinal signs.
- Diagnosis of infectious diseases of poultry with respiratory signs.
- Diagnosis of infectious diseases of poultry with central nervous signs.

10. Culture and identification of bacteria.

- Sample collection for bacteriological examination (organ samples, swabs).
- Inoculation from the sample, bacteriological culture (selection of media, inoculation of different media, culture, pure cultures).
- Identification of bacteria (different staining methods, examination of movement, biochemical tests, kits, PCR-methods, serological methods).
- Preservation and sending of bacterium strains (serial passage, lyophilisation, preservation in semisolid medium, freezing).

11. Culture and identification of viruses.

- Sample collection for virological examination (organ samples, swabs).
- Preparation of cell cultures, virus isolation, examination of cytopathogenic effects.
- Culture of viruses in embryonated eggs, experimental infection of laboratory animals.

- Production and identification of virus strains (plaque isolation, physicochemical tests, haemagglutination test, serological tests).
- Direct detection of nucleic acid and proteins of viruses from samples (PCR, DNA-DNA hybridization, immunofluorescence and immunohistochemical examinations).
- Maintaining and preservation of virus strains (passage, lyophilisation, freezing).

12. Parasitological diagnosis.

- Collection and sending samples for parasitological examinations.
- Culture methods in parasitological diagnostic work.
- Direct examination and concentration methods in the parasitological diagnostic work.
- Parasitological examinations of the alimentary tract, skin and the different organs.
- Immunological methods in the parasitological diagnostic work.
- Molecular biological methods in the parasitological diagnostic work.
- Evaluation of positive and negative laboratory results.

13. The most important serological and immunological methods used in the diagnosis of infectious diseases.

- Sample collection for immunological examinations (serum, discharges, whole blood, lymph).
- General principles of serological methods.
- Agglutination and precipitation tests.
- ELISA, Western blot, immunoperoxidase staining.
- Methods applying immunofluorescence, complement fixation tests.
- Cellular tests.
- Rapid serodiagnostic methods.

14. The most important molecular biological methods used in the diagnosis of infectious diseases.

- Collection of samples for molecular biological examinations (body fluids, fresh and formalin fixed samples, environmental samples).
- Methods of separation and fixing nucleic acid.
- Types of the polymerase chain reactions (PCR), implementation and their evaluation.
- Examination of the DNA using restriction endonucleases, cloning of nucleic acids.
- Sequencing and identification of nucleic acids (gene bank databases, BLAST).
- Methods of separation and fixing proteins (polyacrylamide gel electrophoresis, Western blot)
- Protein identification methods (immunological methods).

15. Diagnosis of infectious diseases using histological methods, histological lesions of some notifiable diseases.

- Diagnosis of abortion of mammals using histological methods particularly notifiable diseases (brucellosis, leptospirosis, herpesvirus abortions of horses, sheep chlamydia etc.).
- Diagnosis of notifiable diseases of birds using histological methods (Newcastle disease, avian influenza, salmonellosis, duck plague etc.).
- Diagnosis of notifiable diseases of fishes and honey bees using histological methods.
- Diagnosis of infectious diseases with gastrointestinal signs using histological methods.
- Diagnosis of infectious diseases with respiratory signs using histological methods.

- Diagnosis of infectious diseases with central nervous signs using histological methods (rabies, spongiform encephalopathies, classical swine fever, Aujeszky disease).