# ABSTRACT

Importance of the diseases produced by lentiviruses is growing daily, affecting numerous animal species, even the humans. Thanks to a great antigenics variability of these viruses and in spite of sustained efforts, solutions for obtaining efficients vaccines and proper treatments it weren't possible to be found untill this moment.

The doctoral thesis with the title"**Researches regarding Maedi Visna**" is extended on 201 pages and is formed, in concordance with the present legal stipulations, from two principal parts: first part entitled "***The actual state of knowledge***" elaborated on 48 pages, 4 tables and 37 figures, the second part "***Personal contributions***" containing 125 pages, 39 tabels, 94 figure, for a better presentation of the content.

First part is formed from three chapters in which are briefly presented informations from the specialty literature regarding the thesis subject which were used further for interpretation and comparations of the results obtained in the second part.

**First chapter** entitled ***"Bibliographical datas regarding history, spreading and importance of Maedi Visna"*** is presenting informations from the specialty literature regarding the first descriptions of the disease and of the etiological agent, the spread and importance of this disease.

Maedi Visna was the original name of the ovine progressive pneumonia. The name of Maedi Visna is coming from Iceland language, **Maedi** meaning difficult breathing, dyspnoea adequate to an interstitial chronic pneumonia, and **Visna** is defining the wasting state, which indicates an slow progressive inflamation of the central nervous system with paresis and paralysis symptoms.

The disease was described for the first time from a Dutch veterinary, Loman D.C, in 1862, the nature of the infection being proclaimed in 1957 by Sigurdsson şi col., sustaining that the disease is produced by a virus. This proclamation was repetead in 1958 before the etiological agent may be cultivated on cellular cultures, event that happened in 1960 when the viral nature of the disease was demonstrated.

**The second chapter** entitled „***Bibliographical data regarding the etiology, epidemiology and pathogenesis in Maedi Visna"*** is structured in three subchapters, synthesizing the principal datas from the specialty literature regarding the nature of the etiologic agent, genomic organisation of the Maedi Visna virus, the proteins and enzymes, beeing described each of their role, the receptors and cellulars targets of the Maedi Visna virus and the vital cycle of lentiviruses. In the second subchapter are presented the infection sources, the transmision mode and the resistance at the physical and chemical factors. In the last subchapter is presented the pathogenesis, beeing detailed the evolution of the immune response, cellular and humoral immunity.

**The last chapter** of the first part entitled: ***„Bibliographical datas regarding the clinical and morphopathological aspects, diagnostic, prevention and control in Maedi Visna"*** describes apects regarding the symptoms and lessions produced in Maedi Visna virus infections, but also aspects regarding the main preventions and control measures.

Clinical signs depend on the evolutive form of the disease. In Maedi evolutive form one of the first clinical signs which appears is represented by a weakening general state, knowed with the name of „thin ewe syndrome", in spite that the animals appetite remains normally. According as the disease evolves it starts to appear changes at the different systems and organs. Evolutive form Visna is characterized by locomotor changes expressed through abnormal positions of the head, lips trembling, hind limbs ataxia, paresis and paralysis, very rare, blindness.

Like in the case of the clinical signs, the lesions are dependent on the evolutive form of the disease. In the Maedi form of the disease the most important lesions are at the lungs, mammary gland and joints.

From the macroscopic point of view, the lungs are enlarged, firm and heavy. At the surface, nodules may be found, which penetrate the lung tissue. Microscopic can be observed the hyperplasia of all lung tissue components.

Macroscopical changes that appear at the mammary gland are represented by firm and smooth, sometimes very hard aspects of the udder. On the section the tissue has non glandular aspect, is smooth, uniform and moisty. Microscopic, the main lesion is the indurative lymphocytic mastitis.

At the joints level it can be observed the joint capsule is thicken and the joint cartilage appears deteriorated and with a large quantity of synovial liquid. Microscopic can be observed a severe infiltration with lymphocytes, plasma cells and macrophages.

In the Visna form, most of the times, the lesions are visible just microscopic. Initially, it ca be observed a cerebrospinal leptomeningitis, which is extending at the nervous tissue, with localization at the periventricular and periependymal level.

In this regions small perivascular cuffs formed from macrophages, plasmocytes, astrocytes and microglial cells are produced.

Prevention and control of the disease, is realized by respecting some general rules and implementation of some pilot projects, based on systematic flock serological examination.

**Chapter IV** presents the aim and objectives of this thesis.

**Chapter V** entitled"***Researches regarding prevalence of Maedi Visna in Covasna county***" is presenting the materials and methods used between 2003 – 2007 for determination of Maedi Visna prevalence in Covasna county, according with the seropositives results obtained after the seologicals tests, age and sex.

For this study the samples used were obtained from all 38 veterinary circumscriptions of Covasna county, the samples being aleatory choosed.

The serological tests were realised on 7116 blood samples, for 1742 samples the serological result was positive, representing 24,48% and for 5374 samples the serological result was negative, representing 75,5%.

From the age point of view the lower prevalence percentage was obtained at the 2 years (5,3%) old sheeps and the higher prevalence percentage was obtained at the 5 years (56,12%) old sheeps.

From the 6448 female tested, 1648 were serological positives, with a prevalence of 25,55%, and from the 668 male tested, 112 were was serological positives, with a prevalence of 16,76%.

**In the VI$^{th}$ chapter V** entitled ***"Semnification of the serological exam in Maedi Visna virus infection diagnostic"*** are presented in 3 subchapters, the main serological methods used for this study and the results obtained.

The methods used for the serological diagnostic were ELISA and AGID, variable commercial kits which are fulfiling the national and international requirements were used.

Between 2003 – 2007 were tested by ELISA method 2922 samples and 976 were positive, representing 33,1%.

By AGID method in the same periode of time were tested 4194 samples and 773 were positives, representing 18,43%.

Also in this chapter was made a comparation between results obtained after the serologicals tests made on 94 blood samples with different ELISA and AGID kits.

The serological researches made regarding the diagnostic value of ELISA and AGID tests, point out by the obtained results that both tests are specifics and precises and may be used in prevention and control programs for this disease.

After the tests were made by both diagnostics methods was observed that ELISA test was more sensitive, detecting lower quantity of antibodies, being more precisely in the diagnostic establishment.

From the 94 blood samples tested, 89 samples were positives at ELISA test and 86 were positives at AGID test, a 99,62% concordance being obtained between the two tests .

**In the VII chapter** entitled ***„Researches regarding an ezootic focar of Maedi Visna in private sector"*** are presented the results obtained after the epidemiological and clinical study.

After the investigations were made it presumed that the first diseases cases showed up in Covasna county because of the uncontroled animals movement and animals purchasing from flocks and areas with unknown status , extension of the disease being made by mammary gland and lungs secretions, the hygiene conditions, also.

Clinical investigations were made on 10 sheeps, from the private sector. From the 10 sheeps examined, 6 of them had clinical signs which are characteristic in Visna form of the disease and 4 sheeps had clinical signs characteristic in Maedi form of the disease. The clinical examination of the animals followed mainly the respiratory and nervous system.

The main clinicals signs in Visna form of the disease had been observed at the nervous system.

A first symptom noticed, after the inspection, was weight loss, in spite of a normal appetite and sufficient food. This symptom was observed at 2 sheeps from the 6 examined with the Visna form of the disease, representing 33,33%.

Also, after the inspection, was noticed that from 6 cases diagnosticated with the Visna form of the disease at 4 cases (66,66%) circular movements were observed, those being made towards the left side. Also was observed that the circle diameter was decreasing according as the animal was continuing his movement.

Another symptom observed was represented by abnormal position of the head and neck, mantained during the animal movement and also in repose. This sign was observed in 5 of the 6 examined cases, representing 83,3%.

On 83,3% cases was observed an abnormal position of the legs during the animal movement and also in repose, animals moving with difficulty.

Ataxia of the front legs was observed at all 6 cases examined with the Visna form of the disease, the sheeps having trouble to coordinate their moves.

In a single case was observed the extension of the supporting base at the posteriors legs and four members ataxia with central origin.

Alternation of attention state with non attention state was seen in 2 cases, representing 33,33% from the examined cases.

In Maedi form of the disease the mains simptoms was noticed at the respiratory system, cardiovascular system and at the front legs.

In the suspect cases of Maedi investigations at the nervous system, at the digestiv tract, respiratory and cardiovascular system were made.

At the nervous system weren't found any modifications, the animal movements was normal without balance problems.

At the digestive tract weren't observed any modifications, appetite was normal for food and water in all examined cases.

At the inspection, palpation, percusion, listening of the abdomen weren't found any modifications.

After investigations made at the respiratory system a firs symptom found, at 2 from the 4 examined cases with Maedi forme of the disease, was spontaneous and profound cough.

At the examination of the respiratory moves abdominal respiration was noticed in all examined cases. Also in all cases harden vesicular murmur, dyspnoea and increasing frequency of the respiratory moves were noticed, the reached value being between 47 and 87 respirations / minute in comparation with the normal values of 12 – 20 respirations / minute.

At the cardiovascular system was observed tahycardia, the cardiac frequency reaching values between 98 and 135 beatings / minute in comparation with the normal values of 70 – 80 beatings / minute.

In two cases (50%) inflammation of the carpal joints was observed.

In the **VIII chapter** entitled: „***Reaserches regarding morphopathological aspects in Maedi Visna"*** the modifications met after the morphopatological exams are presented. The morphopathologic exams were made on 2 sheeps bodies which they presented Maedi evolutive formand 3 sheeps bodies which they presented Visna evolutive form.

At the necropsy of the corps with Visna evolutive form weren't observed macroscopical modifications, the organs and tissues modifications being visible especialy at the microscopical level. At the necropsy of the corps with Maedi evolutive form modifications were observed at the lungs.

For pointing out the histological lesions sections were made in the brain and lungs. In the brain, the main modifications met were leukocyte infiltration, perivascular cuffs, oedema, satelitosis, neuronophagia, neuropil edema, pericarion edema, area with vacuolisations, gliosis, venous thrombosis with perivascular reaction. In the lungs, the main modifications met were interstitial inflamations with alveolar spaces obliteration.

**Chapter IX** entitled ***"Reaserches regarding the surveillance and control of the Maedi Visna disease in Covasna county"*** is presenting a measures plane which allowds to avoid the extension of the disease, eliminations of the sick animals and to reduce the losse of the breeder.

This plane is contains informations regarding the animals purchase, animals movement, hygiene conditions, serological supervision of sheep flocks, measures that must be taken immediately in case of clinical signs and also informations about the elimination of the sick animals.

In **chapter X** final conclusions are presented.