SWOLLEN HEAD SYNDROME

Introduction:
Swollen head syndrome in chickens is associated with Turkey Rhinotracheitis Virus (TRT) now named Avian Pneumo Virus (APV). The role of APV as a primary pathogen is less well established in chickens than in turkeys. In chickens, the syndrome is first described in broiler breeders and in broilers and, since a couple of years, also in layers. First reports of SHS originate from South Africa in 1971. Since then, the disease has been reported in most countries of the world.

The disease:
In broilers APV may be involved together with other agents in a complex respiratory disease syndrome. The use of APV vaccines provides circumstantial evidence for this involvement. In broiler breeders it is strongly associated with SHS as one of the etiological agents. Here circumstantial evidence can be found in serological monitoring of flocks. The syndrome is characterized by respiratory disease, apathy, swelling of the infraorbital sinuses and unilateral or bilateral facial swelling, extending over the head. These signs can be followed by disorientation and torticollis, leading to suspicion of Newcastle. The disease often is complicated by secondary bacterial septicemia. E. Coli is mostly isolated. Morbidity may reach 20%, mortality usually does not exceed 2-4%. Egg production is seriously affected and often does not return back to standard. Egg quality and hatchability can also be affected but usually return back to standard. The infection spreads slowly in a flock. In broiler breeders the disease is most common seen at the onset of production. In layers, the clinical symptoms can be very mild and sometimes only a temporary drop in feedintake is noticed, followed by a discolouring of the brown eggs and a drop in production up to 15%.

Pathology:
On post mortem an exsudative sinusitis can be found with subcutaneous edema. Some birds will have a purulent otitis (disorientation). Also tracheitis and a necrotic pneumonia can be found. Birds in production will show ovary degeneration.

The virus:
APV is a ribonucleic acid virus, which is highly susceptible to disinfectants. Virus replication takes mainly place in the respiratory tract although fecal shedding seems possible. Transmission is mainly by contact between birds and airborne. There is no evidence for vertical and/or egg transmission. The virus stays only for a few days detectable in the bird and so far no carriers are ever found. At present two subgroups are well described: subtype A and B. Both subgroups can infect chickens and turkeys. Differences in tropism of the subgroups are suspected but not yet found. A third subtype, the Colorado strain is recently described.

Diagnosis:
The diagnosis has to be based on:
1 clinical findings
2 laboratory results by virology and/or by serology and/or by polymerase chain techniques. Virology can be done on embryonated eggs or on tracheal organ cultures followed by confirmation with electron microscopy, immunofluorescence or immunogold techniques. Multiplication based on trachea organ cultures is most successful. One of the major problems with isolating APV is the short time the virus is present in the affected bird. Sick birds must be sampled as quickly as possible after the first signs of SHS. Vaccine strains also can complicate virology.
Serology is the most used technique confirming APV. Several Elisa’s are available but the sensitivity differs greatly in between. Detection of vaccine induced antibodies also differs between the different Elisa’s. The Colorado subtype is hardly detected by the present Elisa’s. The PCR technique is recently developed and is available as a routine diagnostic tool.

**Prevention and control:**
Prevention and control has to be based on bio-security (isolation of infected flocks), serological monitoring and vaccination strategy. Infected flocks can be treated with antibiotics in the clinical phase of the infection, limiting secondary bacterial infections. For broilers several live-attenuated vaccines are available. For breeders and layers the standard system live priming vaccination followed by an inactivated vaccine is recommended. Most vaccines protect against all subtypes and create local and systemic protection. The application of live vaccines has to be done very thoroughly and careful.