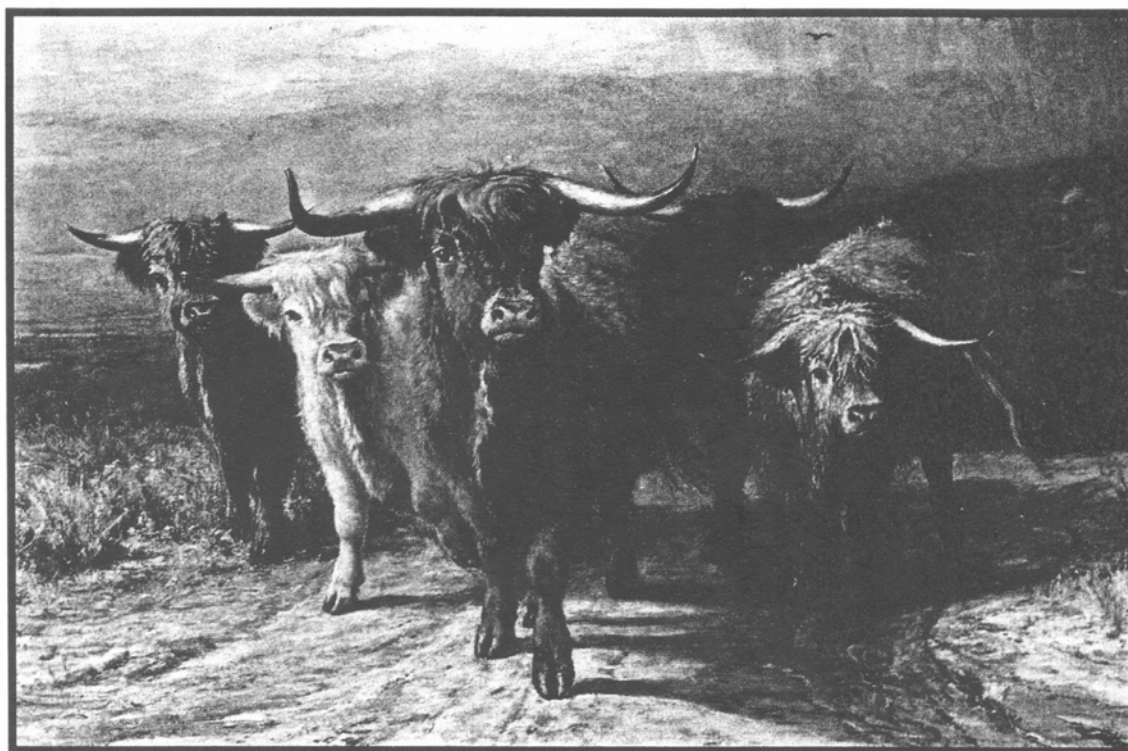


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recognised as the cause of CNS nematodiasis in a number of aberrant host species. *Elaphostrongylus cervi* (but not *Parelaphostrongylus* sp.) is known to be endemic in the Swiss cervid population. In central Europe however, cases of putative elaphostrongylosis or parelaphostrongylosis in small domestic ruminants have to our knowledge not been reported before.

148) TESTICULAR CALCINOSIS IN POLLED MURCIANO-GRANADINA GOATS.

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The current study involves the existence of testicular alterations in 60 male polled Murciano-Granadina goats. The animals were between 3 and 18 months and were euthanized monthly to study different portions of the genitalia. Samples were fixed in Bouin's solution and embedded in paraffin. The staining techniques used included: H&E, PAS and Masson trichromie.

Different degrees of testicular calcifications and ectasia of the seminiferous tubules were observed in 8 polled goats (13.3%). As these lesions have various degrees of severity, we have divided them into three phases: initial, intermediate and terminal. Macroscopic alterations were not observed in the **initial phase**. Histologically, they were ectasias of the seminiferous tubules. These tubules were filled with desquamated distinct germinal cells as well as eosinophilic material which occupied all the lumen. Small areas of microlithiasis in the testicular parenchyma were observed during the **intermediate phase**. Microscopically, these areas presented broken tubules and developed a focal granulomatous inflammatory reaction. In the **terminal phase** focal intratubular calcification and tubular degeneration were observed. Eventually, these tubules were only lined by Sertoli cells. Their basal membranes were lightly thickened.

Testicular calcinosis has been described in ruminants in association with a degeneration of the germinal epithelium in old animals (Ladds *et al.*, 1973; Ladds, 1993). In this study we have found that these lesions can be observed in young goats and is always joined to the polled phenotype. Some authors have related the polled character with the development of epididymal spermatie granuloma in Alpine breeds (Sollerand *et al.*, 1969; Hamerton *et al.*, 1969) but till now it has not been clearly established an association between granulomas and testicular calcifications. We deeply think it seems to exist a major predisposing tendency of the young polled animals to develop degenerative changes of the germinal epithelium which get into tubular calcification.

149) A FIELD SURVEY TO DETERMINE WHETHER *NEOSPORA CANINUM* IS A SIGNIFICANT CAUSE OF OVINE ABORTION IN ENGLAND AND WALES.

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Neospora caninum is a significant cause of bovine abortion and neonatal mortality in many countries. Abortion has been reported following experimental *Neospora* infection in sheep (Dubey and Lindsay, 1990; Buxton and others, 1995) although the only evidence of natural ovine *Neospora* infection has been the demonstration of central nervous system disease in a one-week-old lamb (Hartley and Bridge, 1975; Dubey and others, 1990). This survey was designed to assess the role of *N.caninum* as a cause of ovine abortion.

During the 1994/95 lambing season ovine abortion specimens received at MAFF Veterinary Investigation Centres in England and Wales were examined according to established laboratory methods. Where no infectious abortion agent was identified

foetal heart and brain were examined histologically. Nine cases showing non-suppurative inflammatory lesions of these organs were further examined immunocytochemically using antibodies against *Toxoplasma gondii*, *Sarcocystis* species and *N.caninum*. Pleural fluids, where available, from foetuses examined histologically were also screened for serological evidence of *N.caninum* infection.

Immunocytochemistry was positive for *T.gondii* in the brains of 4 foetuses but in the remaining 5 there was no labelling by any of the antisera and no serological evidence of *Neospora* infection was found in any of the pleural fluid samples examined.

Although infection by *N.caninum* has been demonstrated in a considerable number of cattle in England and Wales these results suggest that it rarely causes abortion in British sheep.

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150) COMPARISON OF HISTOPATHOLOGICAL LESIONS INDUCED BY SINGLE AND DOUBLE INFECTION WITH *FASCIOLA HEPATICA* AND *SCHISTOSOMA BOVIS* IN SHEEP.

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Cross-resistance between *Fasciola hepatica* and *Schistosoma bovis* has previously been demonstrated in calves and sheep. Both parasites are common in some regions of Spain and natural infections are frequently diagnosed. An experimental study was carried out in order to investigate different aspects of the diachronic infection of *F.hepatica* and *S.bovis* in lambs. In this work the histopathological features in liver and small intestine were studied. Four groups of 6 lambs each were made. Lambs from group I were orally infected with 80 *F.hepatica* metacercariae and percutaneously challenged after 10 weeks with 400 *S.bovis* cercariae. Group II was exposed to 400 *S.bovis* cercariae and challenged 6 weeks later with 220 *F.hepatica* metacercariae. Groups III and IV were infected with 400 *S.bovis* cercariae and with 80 *F.hepatica* metacercariae, respectively. All lambs were killed 24 weeks after the last infection. The more significant liver changes associated with *F.hepatica* and *S.bovis* such as interstitial hepatitis, bile duct hyperplasia, portal vein hypertrophy were more severe in groups with double infection. Other findings such as the presence of globules leucocytes in the bile ducts and the presence of pigment in macrophages were also more significant in these groups. When the specific lesions caused by both parasites were compared it could be observed that the primary infection with *S.bovis* or *F.hepatica* significantly increased the lesions produced by the parasite used in the challenge. These results could indicate a cross sensitivity between both parasites. In the small intestine of lambs from groups infected with *S.bovis* (groups I, II and III) granulomas were observed in lamina propria and submucosa (with and

without Peyer's patches) most of them located in the former. The type of these granulomas with regard to its cellular morphology were different. Group I showed granulomas mainly composed of macrophages together with an important number of lymphocytes and plasma cells and with degenerated eggs, some of them with Hoeppli phenomenon. However, in group III the granulomas showed scanty number of lymphocytes an eosinophilic centre containing either degenerating or intact eggs in variable numbers. These features could be explained by a previous immune resistance to *S.bovis* induced by *F.hepatica* infection.

151) COMPARISON OF THE ABSORBED ELISA AND ACID TESTS WITH CLINICOPATHOLOGICAL FINDINGS IN OVINE CLINICAL PARA-TUBERCULOSIS.

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Sheep with clinical paratuberculosis (n=32) and normal healthy control animals (n=43) were tested for serum antibodies to *Mycobacterium avium* subspecies *paratuberculosis* using the absorbed ELISA and AGID tests. All sheep were necropsied and diseased cases were categorised as having either multibacillary ("lepromatous") or paucibacillary ("tuberculoid") intestinal lesions. The ELISA and AGID tests were highly sensitive within the multibacillary group (86.4% and 100% respectively) but the sensitivity levels of these tests in the paucibacillary group were significantly lower. These findings were reflected in the ELISA optical density (OD) readings with multibacillary sample values significantly greater than those of the paucibacillary and control groups. ELISA OD values appear to correlate with the degree of mycobacterial presence in intestinal lesions. These results highlight the usefulness of serological testing in detecting sheep with the multibacillary form of paratuberculosis but also emphasise the difficulties in diagnosing animals with the paucibacillary form of disease.

152) COMPLEMENT FIXATION TEST AND EXCRETION OF *M.PARATUBERCULOSIS* IN FAECES IN CORRELATION TO PATHOLOGICAL LESIONS IN SUBCLINICAL AND CLINICAL FORM OF OVINE PARATUBERCULOSIS.

M. Pigacnik, P. Juntos, and L. _enk. Veterinary Faculty, Ljubljana, Slovenia.

A group of eight sheep in which complement fixation test and microscopic examination of faeces were positive or suspicious for infection with *M.paratuberculosis*, was surveyed for one and half years. Animals in this experimental group were from a flock where clinical cases of paratuberculosis had been diagnosed previously. Each week faeces were collected directly from rectum, smears stained with Ziehl-Neelsen method and examined under the light microscope. Blood serum was tested monthly with complement fixation test. Results of complement fixation test were evaluated as positive, inconclusive or negative. Excretion of mycobacteria in faeces was evaluated as negative when the number of acid fast microorganisms was zero, ± when only one bacteria was found, + in cases with few single acid fast microorganisms, +++ when we found one or two pairs, ++++ in cases with numerous acid fast microorganisms. Results of both methods varied most of the time. Only one animal from this group died during the time of observation, from reasons other than paratuberculosis. Despite positive complement fixation test in almost all samples taken from this animal and constant findings of acid fast microorganisms in faeces, we found no obvious paratuberculous intestinal lesions at the time of death and only small numbers of mycobacteria were found in mucosa. In the same period another animal in the flock died

with typical clinical form of paratuberculosis and with prominent gross and microscopic lesions. Eighteen months before the onset of clinical signs in this animal the result of complement fixation test was inconclusive and faeces examination negative.

153) PATHOLOGICAL LESIONS IN ORGANS OF SHEEP WITH SEROLOGICAL POSITIVITY TO MAEDI-VISNA VIRUS.

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The incidence, distribution and intensity of M-V characteristic pathological lesions were determined in 38 sheep with serological positivity to M-V virus. Lungs, mammary glands, joints and CNS were subjected to histopathological examination. The samples were processed using the paraffin technique and stained with HE, Luxol fast blue and Cresyl fast violet. Lesions were revealed in 37% of the positive sheep, their incidence in the organs was 55% of lungs, 58% of mammary glands, 27% of CNS and 4% of joints. Concurrent incidence of pulmonary adenomatosis and pneumonias was determined in 57% of the examined cases. The observed morphological lesions corresponded to initial or medium progressive affection. The need of detailed pathomorphological examination of culled sheep was emphasised along with the persistent implementation of virus-eradication treatments on sheep farms.

154) STUDIES ON THE PRESENCE OF MAEDI-VISNA VIRUS IN SHEEP MAMMARY EPITHELIAL CELLS.

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Maedi-visna virus (MVV), an ovine lentivirus that causes a multisystemic disease in sheep, mostly replicates in cells of the monocyte-macrophage lineage, although some other cell lineages have shown to be productively infected. The aim of this work is to study the presence of MVV in mammary epithelial cells.

Six ewes, seropositive to MVV and clinically affected by diffuse indurative mastitis were selected from a single flock. Two seronegative, clinically normal sheep were used as control. Animals were killed and samples for histological studies, immunohistochemical tests, viral isolation, PCR and culture of epithelial cells were taken from the mammary gland.

Results demonstrated the presence of characteristic MVV lesions in the mammary gland. Viral presence in the mammary gland was demonstrated by PCR and viral isolation and MVV antigen was detected both in tissue sections and in cytocentrifuge smears obtained from cultures of epithelial cells.

This work demonstrates local replication of MVV in the mammary gland and clarifies the cellular lineages that replicate the virus.

155) PrP RECOGNITION IN SHEEP WITH SCRAPIE.

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Cheviot sheep from the NPU flock were examined for the PrP protein in brain sections using immunocytochemistry in order to aid scrapie diagnosis. Tissues were collected from sheep which had been experimentally or naturally infected with scrapie, and fixed in periodate-lysine-paraformaldehyde or in formalin. Immunolabelling of PrP was achieved in all scrapie-affected sheep using the peroxidase-antiperoxidase method and a monoclonal antibody (FH11, Dr. Chris Birkett, Institute for Animal Health, Compton), which had been raised to a recombinant synthetic N-terminal PrP protein. Several pre-treatments were studied in an effort to enhance PrP immuno-labelling e.g., try-