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Table 1: After treatment of dog glial cell cultures with X/XO and ROS scavengers or metal chelators, oligodendrocytes were classified in three groups according to their morphological appearance: (+). Cells that have lost their peripheral fine branching of processes, (++) cells with major loss of processes and cytoplasmic protrusions, (+++) cell-fragments without processes.

Scavenged Species	Scavenger	Concentration	Damage
O ₂ ⁻	SOD	100 U/ml	++
H ₂ O ₂	Catalase	100 U/ml	++
H ₂ O ₂ +O ₂ ⁻	SOD/Catalase	100 U/ml	+
°OH	Mannitol	50 mM	+
Fe ⁺⁺	Desferal ^R	50 µM	+
None			+++

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PATHOLOGICAL FINDINGS IN DIETARY PRODUCED OXIDATIVE STRESS IN GROWING PIGS

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The classical mulberry heart disease (MHD) with microangiopathy (MAP) of pigs, according to Grant (1961), is characterized by vascular lesions principally in the myocardium whilst degenerative changes occur inconstantly. Van Vleet et al. (1977) described an atypical mulberry heart disease involving mainly degenerative changes.

The aetiology of MHD is not yet clearly understood although the present knowledge presume a multifactorial genesis with dietary involvement. According to Korpela (1988), an increased myocardial and hepatic iron concentration in pigs with microangiopathy acts as a risk factor of oxidative damage.

We produced an experimental myodegeneration of skeletal muscles in all 8 pigs with a diet deprived selenium and vitamin E. In order to produce MAP we had provoked the oxidative stress by injecting 3 ml iron dextran IM in four pigs.

Macroscopically the condition of nutritional myodegeneration, also known as white muscle disease, was characterized by an overall pale,

tely provide data for therapeutic intervention of brain damage in encephalitis caused by ROS.

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yellowish colour and a translucence of the skeletal muscles. Further gross pathological changes included ascites (100%), hydrothorax (37%), pericarditis (62%) as well as edema of lymph nodes (50%) and lungs (50%).

The microscopical examination of the skeletal muscle (M. longissimus dorsi) revealed varying degrees of degeneration including swelling of muscle fibers and loosening of the fibrillar pattern. Also the longitudinal and cross striations were no longer visible. The local arrangement of nuclei in chains was considered being a reparative process. The histopathology showed further hepatosis diaetetica and myocardial degeneration as described by Grant (1961) and Van Vleet et al. (1977).

As previous studies show, selenium deficiency is associated with hepatosis diaetetica and nutritional myodegeneration but not with MAP (Lindberg et al., 1972; Moir and Masters, 1979). In our study none of the pigs showed vascular lesions in the myocardium. Further experiments are necessary to study the role of iron supplementation in dietary produced oxidative stress in growing pigs.

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PATHOLOGY OF AGING IN THE CHICKEN

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Although the process of aging in man and laboratory animals has been studied quite extensively during the last couple of decades (Andrew, 1971), not very many data concerning food producing animals are available. This is mainly due to the fact that for economic reasons the life of these animals is considerably shorter than it would be under natural circumstances.

In order to make a contribution to the knowledge of the pathological processes which take place in senescent animals, we carried out a statistical and morphological study on the pathology of aging in the chicken with the belief that these observations could be of some relevance both to veterinary and comparative pathology.

Sixty-seven chickens, 61 females and 6 males, obtained from small farms at different ages were housed in our facilities until natural death occurred. The animals, aged 3 to 11 years, were necropsied immediately after death and the gross lesions were recorded.

The cause of death could be established in 51 animals and the related results are summarized in Table 1.

The data concerning the occurrence of the gross lesions involving the different organ systems are reported in Table 2. The alimentary tract was affected by pathological changes in 93% of the chickens; these mainly consisted of inflammatory, degenerative, necrotic and neoplastic (Fig. 1, 2) lesions affecting the liver parenchyma. Very often ascites and peritonitis could also be observed. 84% of the

Table 1: Cause of death

Neoplasia	15
Salpingo-peritonitis	12
Chronic hepatopathy	11
Cardiac failure	5
Uricosis	2
Marek's disease	1
Coligranulomatosis	1
Tuberculosis	2
Aspergillosis	1
Intestinal volvulus	1

Table 2: Percentage of lesions of the different apparatuses

Digestive tract	93%
Cardiovascular system	84%
Urogenital system	82%
Endocrine and Lymphatic system	45%
Musculo-skeletal system	32%
Respiratory tract	24%

animals showed lesions of the cardiovascular system and 51% of the birds inspected were affected by atherosclerosis, mainly localized to the abdominal part of the aorta. The urogenital system showed a high degree of changes (82%), but most of these consisted of atrophy of the ovaries and oviducts, which could be considered as almost physiological changes due to the aging. Differently from what has been well established in poultry raised under intensive conditions, the pathology of the respiratory tract does not seem to play a major role in aged poultry (24%).

One of the most interesting observations standing out from this study is represented by the high rate of the non viral tumours (22%), which shows a considerable discrepancy with the values reported by diffe-

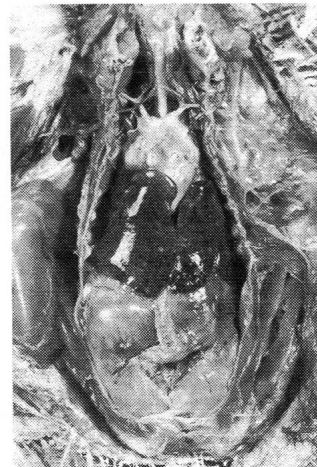


Fig. 1: Liver: focal necrosis



Fig. 2: Liver: Hepatoma

rent authors about the percentage of neoplastic lesions observed in broilers at slaughtering (.08 to 3%) (Hemsley, 1966; Bergmann et al., 1984).

Therefore our data show a direct correlation between aging and the development of non viral tumours in poultry, a phenomenon otherwise well established in mammals.

References

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COMPARISON OF LESIONS IN ONE- AND TEN-DAY-OLD GNOTOBIOTIC CALVES INOCULATED WITH A ROTAVIRUS OF LOW VIRULENCE

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Calves usually experience infection with rotavirus in the first few weeks of life, but many of these infections are subclinical (McNulty & Logan, 1983). Fully virulent bovine rotaviruses are pathogenic in calves of any age, whereas strains of low virulence only cause diarrhoea in day-old calves (Bridger, 1988). Explanations for this variation in virulence have been sought by studying pathogenesis in one-day-old and ten-day-old calves inoculated with a strain of low virulence.

Material and methods

Three, one-day-old gnotobiotic calves were inoculated orally with 10⁶ TCID₅₀ of a cloned rotavirus of low virulence (strain C3-160) and three were inoculated similarly at ten-days-old. Two groups of three calves were inoculated with virus-free medium and were age-matched controls. Calves were examined at least twice daily for clinical

signs of disease and faeces were collected and the virus content assayed by inoculation of MA-104 cells. Calves were killed within 24 hours of peak virus excretion. They were inoculated with colchicine prior to induction of terminal anaesthesia and small intestinal tissue was taken for measurement of villus height and crypt cell production rate (MacDonald & Ferguson, 1978; Hall et al., 1988a), for histological examination (Hall et al., 1988b) and for immunoperoxidase detection of rotavirus antigen (Parsons et al., 1984). The area of immunostaining in the epithelium was measured with an image analyser and expressed as the mean percentage of total epithelial area.

Results

Control calves and ten-day-old calves inoculated with rotavirus C3-160 remained healthy. Calves inoculated at one-day-old became depressed and developed explosive watery diarrhoea approximately