

registered and treated as all-or-none traits in genetics analyses. A significant sire effect was found for all serum traits except albumin, with heritability estimates between 0.1 and 0.2. The disease characters showed heritability estimates between 0.04 and 0.08. Immunoglobulin and total-protein concentrations seemed to have a negative genetic correlation to diseases.

Genetic polymorphisms of plasma α_1 -protease inhibitors in some domestic animals

R. KUMAR JUNETA and B. GAHNE

*Department of Animal Breeding and Genetics,
Swedish University of Agricultural Sciences, S-750 07 Uppsala, Sweden*

The genetic polymorphism and phenotypes of plasma α_1 -protease inhibitor (α_1 -PI) in horse, cattle, sheep, goat, pig, dog and mink were described in a brief review. In all these species, two α_1 -protease inhibitors (Pi-1 and Pi-2) were observed. Pi-1 showed inhibition for both trypsin and chymotrypsin while Pi-2 showed inhibition for only trypsin. In horse 6 Pi-1 and 5 Pi-2 alleles were observed. There was a very close genetic linkage between Pi-1 and Pi-2 loci in horse. The horse Pi-1 and Pi-2 fractions together correspond to the horse acidic prealbumin (Pr) fractions described earlier in literature.

In cattle, sheep and goat, polymorphism was observed for only Pi-2. Three alleles in cattle, three in sheep and two alleles in goat were observed.

In pig, the earlier described polymorphism pre-albumin (Pa) was identified as α_1 -protease inhibitor. Two Pa alleles have been reported in pig.

In dog and mink, polymorphism was observed only for Pi-1. Three Pi-1 alleles were observed in several breeds of dogs. In mink, the polymorphic post-albumin (Pa) described in literature, was identified as α_1 -protease inhibitor.

The α_1 -PI fractions in all these species are present in high concentration in plasma and thus could be visualised by general protein staining of gels after electrophoresis. The possible association of α_1 -PI phenotypes with respiratory and inflammatory diseases in domestic animals was also briefly discussed.

Immune response to some *E. coli* antigens in swine

I. EDFORS-LILJA *, B. GAHNE *, B. MOREIN ** and H. PETERSSON *

** Dep. of Animal Breeding and Genetics, Swedish University of Agricultural Science,
S-750 07 Uppsala, Sweden*

*** National Veterinary Institute, S-104 05 Stockholm, Present address :
Dep. of Virology, Swedish University of Agricultural Science, Box 585
S-751 23 Uppsala, Sweden*

The humoral immune responses to two *E. coli* antigens, K88 and 0149, were studied in 60 pigs after 9 sires and from 19 litters. One animal per litter was in addition kept as a control. The animals were immunized subcutaneously with a whole cell suspension of *E. coli* at the age of approximately 10 weeks. Ten of the animals were given a second immunization 3 weeks after the first one. Blood samples were taken immediately before immunization, 1 and 2 weeks post-injection. The total amount of specific antibodies in serum to K88 and 0149 antigen were analysed by ELISA technique. A significant increase in antibody titers was obtained after immunization, although a pronounced individual variation was seen. The animals were given a constant dose of the suspension without regard to

differences in body weight. However, no effects of body weight on the immune responses were seen. The effect of sire was highly significant ($p \leq 0.001$) indicating a genetic influence on the immune response. The overall correlation between the primary and secondary response was for K88 antigen 0.76 and for 0149 antigen 0.15.

Heterogeneity of RNA transcription activities of immune cells of domestic animals

B. MAYR and W. SCHLEGER

*Institut für Tierzucht und Genetik, Veterinärmedizinische Universität Wien
Linke Bahngasse 11, 1030 Wien, Austria*

Nucleolus organizer regions were determined in cattle, pig, sheep, goat, dog, horse and chicken. The mapped genes were correlated to the nucleoli formed in peripheral blood lymphocyte interphases. A positive correlation was found between the number of nucleolar organizer regions per diploid genome and the nucleolar coefficient. Peculiarities of the different species concerning nucleolar formation and association/dissociation pattern is highlighted. The use in definition of immune cells in domestic animals in order to investigate cellular heterogeneity is pointed out.

Immunoglobulin levels in the blood serum of pigs as criteria of heredity and ontogenesis

E. WEHRHAHN, F. KLOBASA and F. HABE

*Institut für Tierzucht u. Tierverhalten, Mariensee
3057 Neustadt 1, West Germany*

Milk and blood immunoglobulins were analyzed in 22 young sows and in 24 older sows (DL). In addition, the blood immunoglobulin levels of two offsprings each were monitored. Older sows had higher total Ig-serum values than young sows. Their milk IgG and IgA contents also surpassed those of young sows, which however showed higher IgM contents. The initial serum pattern of the piglets mirrored the maternal Ig-secretions in the milk (passive immunization). After weeks 2-3 piglets of the young sows showed a steeper rise in the Ig production rate than piglets from older sows. They caught-on however during the fattening period and had arrived at higher IgA-levels when slaughtered.

A number of correlations between sow/piglet Ig patterns, fattening performance and carcass compositions will be reported.

Hypothermia in newborn lambs

A. EALES

Moredun Research Institute, 408 Gilmerton Road, Edinburgh EH17 7JH

Hypothermia, a low body temperature, is an important cause of mortality in newborn lambs in the U.K. There are two major causes of this condition : (1) Excessive heat loss