



GENETIC RESISTANCE OF PIGS TO NEONATAL ENTERITIS CAUSED BY E. COLI

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► To cite this version:

R.A. Gibbons, R. Sellwood. GENETIC RESISTANCE OF PIGS TO NEONATAL ENTERITIS CAUSED BY E. COLI. *Annales de génétique et de sélection animale*, 1978, 10 (4), pp.588-588. hal-00893055

HAL Id: hal-00893055

<https://hal.science/hal-00893055>

Submitted on 11 May 2020

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some reason had been excluded from the testing. After this merging exactly 10 000 individuals remained.

The disease records and certain production traits have been analysed statistically, whereby the health registrations were regarded as all-or-none traits (0 = healthy, 1 = sick), i.e. the degree of affection is disregarded.

The results from these analyses shows that *Landrace* pigs seems to have far fewer lung lesions than *Yorkshire*, whereas the relation for AR is with weak significance the reverse. The sex differences indicate that castrates are somewhat more susceptible to the infectious diseases than gilts are.

The heritability estimates for the diseases, considered as all-or-none traits lie between 0.12 and 0.14.

The phenotypic correlations between lung- and snout lesions and production traits show that generally speaking a disease pig grows more slowly, is leaner, has a smaller *M. Longissimus dorsi* area and has rather more meat in the side, compared with healthy animals. Genetic correlations between respiratory diseases and productions traits fail to display any significance.

GENETIC RESISTANCE OF PIGS TO NEONATAL ENTERITIS CAUSED BY *E. COLI*

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The strains of *E. coli* which are usually associated with neonatal diarrhoea in the piglet possess the K88 antigen. This antigen is a virulence determinant and it functions as such by adhering the organisms to the intestine of the piglet. In some pigs the gut cell receptor for K88 is absent, K88 positive organisms do not attach themselves to the intestinal wall of these pigs which animals are therefore almost wholly resistant to the disease. Resistance is inherited as a simple autosomal recessive designated *s*; the dominant allele *S* conferring adhesiveness and disease susceptibility on the animal.

In spite of the advantage conferred upon the homozygous recessive *ss* neonate, allele *S* seems common, indeed predominant. The probable reason for this paradox lies in the relative failure of *ss* sows to respond immunologically to the K88 positive *E. coli* in the gut. This causes heterozygous piglets out of homozygous recessive sows to be at a large disadvantage compared with all other piglets. Since *s* is the less common allele, selection against this heterozygote tends to eliminate it. Despite the prevalence of allele *S*, there is no disadvantage to *s* unless *S* is also present in the same breeding population; the *ss* animal should therefore be economically valuable.

STRAIN AND FAMILY EFFECTS ON RESISTANCE OF "LEGHORN" HENS AGAINST DIFFERENT DISSAE

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Mortality data of 3 *Leghorn* lines and their crosses from the years 1972, 1973 and 1975, totalling about 12 000 female offsprings from more than 150 sires and 2 000 dams were analysed. The hens were kept in the *Institute for Small Animal Research* at Celle under conditions of normal exposure to disease.

The investigation leads to the following results:

- 1) Most mortality traits were influenced by the line combinations as well as paternal- and maternal-line effects.
- 2) Even under conditions of normal exposure crossbreds had less mortality than purebreds.
- 3) For Marek Disease heritability estimated on a "liability" scale seems to be such that it is worthwhile to seek for a normally distributed alternative trait when selecting for livability.