

Effect of Age on the Susceptibility of Pigs
to Mycoplasma hyopneumoniae pneumonia

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Under experimental conditions, mycoplasmal pneumonia of swine (MPS) develops in all ages of pigs inoculated with M. hyopneumoniae but, results obtained by contact exposure of susceptible pigs to previously infected ones, especially young pigs (Ross and Amanfu unpublished, 1979), have been inconsistent. In addition, unpublished evidence cited by Switzer and Ross (1975) indicated that the peak incidence of complement-fixing antibodies among naturally-infected pigs was from 5 to 12 months of age and Willeberg et al. (1978) found a peak incidence of MPS at 16 to 19 weeks of age. These observations suggest that older pigs are relatively more susceptible to M. hyopneumoniae than younger pigs.

Methods: In experiment A, 3 groups of respiratory-disease-free (SPF) pigs of different ages were used; group 1 consisted of six 3 to 4 week old pigs; group 2 of six 6 to 7 week old pigs and group 3 of six 12 to 13 week old pigs. Each group was exposed by contact to seeders that had been inoculated with M. hyopneumoniae 18 and 21 days previously. The 3 age groups of pigs were exposed to the seeders for 27 days and were necropsied 41 to 43 days after the beginning of contact.

In experiment B, 2 groups of SPF pigs of different ages were used. Each group contained three 3 week old pigs and three 11 to 12 week old pigs. Groups were exposed by contact to three seeders for 20 days. At the end of this period the seeders were removed and each pig was moved to an individual Smidley hog house with a wood slat porch. Twenty-nine to 30 days after the contact-exposed pigs had been separated, they were necropsied.

At necropsy, typical lesions of MPS were recorded as follows: 1 = no gross lesions; 2 = up to 25% of the affected lobes; 3 = 25 to 50% of the affected lobe; 4 = 50 to 75% of the affected lobe and 5 = 75 to 100% of the affected lobe. Total lesion scores were based on sums of lobar scores.

Lung sections from all lobes were examined with a light microscope for the stage and severity of disease. Severity was determined by dividing the total number of bronchi and bronchioli in a section by the number of airways affected.

The effect of age on the susceptibility of pigs to M. hyopneumoniae was determined by the evaluation of the occurrence and intensity of MPS lesions and isolation of the organism (Friis, 1975) from pigs in different age groups. Data were analyzed with the chi-square test.

Results: The number of pigs with pneumonia and the distribution of pigs in different categories of gross lesion severity scores are summarized in Tables 1 and 2. There were no differences in the proportion of affected animals in different categories of gross lesion severity scores among the different age groups in either experiment ($p > 0.05$). Similarly there were no differences among groups in the number of lobes with macroscopic or microscopic lesions of MPS, in the number of pigs with microscopic lesions of MPS or in the severity of microscopic lesions of MPS.

Table 1. Occurrence and severity of pneumonia in three age groups of contact-exposed pigs. Exp. A.

Experimental groups (weeks of age)	No. of pigs with pneumonia	No. of pigs in categories of gross lesion severity scores		
		7 ^a	8-11	12-15
3	3/6	3/6	2/6	1/6
6	4/6	2/6	2/6	2/6
12	5/6	1/6	2/6	3/6

^aEach normal lobe received a score of 1 hence a completely normal pig received a score of 7. Higher scores indicated a greater extent of lung tissue involved.

Table 2. Occurrence and severity of gross pneumonia in two age groups of contact-exposed pigs. Exp. B.

Experimental groups (weeks of age)	No. of pigs with pneumonia	No. of pigs in categories of gross lesion severity scores		
		7 ^a	8-11	12-15
3	4/6	2/6	1/6	3/6
11	6/6	0/6	2/6	4/6

^aSee Table 1.

Conclusions: No differences were observed between age groups of pigs in occurrence and severity of MPS lesions or in detection of M. hyopneumoniae in lung tissue. These observations suggest that pigs from 3 to 12 weeks in age are equally susceptible to MPS. Our failure to detect an influence of age on the occurrence and severity of MPS is in agreement with results obtained by Pullar (1948) and Holmgren (1974).

Selected References: Friis, N. F.: Nord. Vet. Med. 1975, 27:337; Holmgren, N.: Res. Vet. Sci. 1974, 17, 145; Pullar, E. M.: Aust. Vet. 1948, 24, 320; Switzer, W. P. and Ross, R. F.: in H. W. Dunne and A. D. Leman, Diseases of Swine, 4th ed., Iowa State University Press, 1975; Willeberg et al.: Nord. Vet. Med. 1978, 30:513.