

Pleuritis in herds with low levels of antibodies to *Actinobacillus*

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Introduction

Pleuritis are often associated to *Actinobacillus pleuropneumoniae* (*App*). Pigs in affected herds generally have high prevalences of pigs with high amounts of antibodies to *App* (1), but also herds with low levels of antibodies to *App* have been attended with high frequencies of pleuritis. This study aimed to scrutinise the impact of secondary invading microbes in such herds.

Materials and Methods

Three farrow to finish sites within a local concern with an annual production of 22,500 fatteners were investigated. Registrations for pleuritis ranged from 16.4 to 30.2 % at slaughter. In total, 212 serum samples were collected in one day. Antibodies to *App* serotypes 2 and 3 and to *Pasteurella multocida* (*Pm*) were analysed with ELISA systems (2, 3).

An indirect ELISA detecting antibodies to *Streptococcus suis* (*Ss*) was developed. In brief, microtiter plates were coated over night with an ultrasonicated antigen of *Ss* (strain CCUG 7984). After 1 h of incubation with serum diluted 1/100 in PBS-T the conjugate (Protein A, Bio-Rad) was added. The reaction was stopped with H₂SO₄ and the optical density was read at 495 nm. A positive control adjusted to A₄₅₀ = 1.0 was added to each plate.

Table 1. Prevalences (%) of serum antibodies to *App*, (*App*2, *App*3 or both), *Pm* and *Ss* related to age

Age,	(n)	Seroneg	<i>App</i> +		<i>Pm</i> +		<i>Ss</i> +
			Alone	and <i>Pm</i> and <i>Ss</i> +	Alone	and <i>Ss</i> +	
5 weeks	10	83		20			
8 weeks	30	60	7	7		23	3
11 weeks	20	60				25	10
14 weeks	30	45		5		40	10
17 weeks	20	10		30	20	30	10
21 weeks	20	5	5	10	55	10	10
24 weeks	40	18		25	30	13	13
gills	6				67		33
Sows, 1st par	12				67	8	25
Sows, 2nd par	12				75		25
Sows, 3rd par	12				83		17

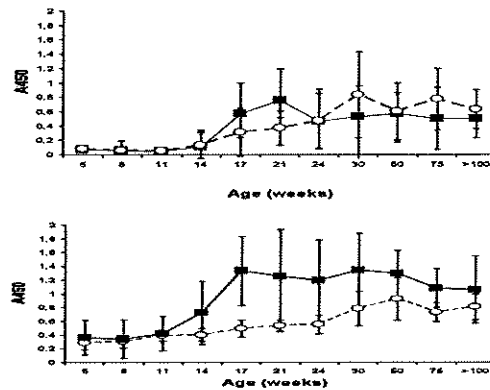
Results

The OD-values to *App*2 increased from 14 to 17 weeks of age, but remained at modest levels. The onset of *App*3 was not equally evident, but the OD-values increased with time (Figure 1 top).

Serum antibodies to *Pm* started to increase between 11 and 14 weeks of age, whereas the serological response to *Ss* progressed more slowly (Figure 1 bottom).

All ELISA-systems employed A₄₅₀ as cut off. The point prevalence rate for seropositivity related to age is shown in Table 1. Sows were generally seropositive to all microbes, but absorbance values remained stable.

Figure 1. Mean A₄₅₀-levels of serum antibodies to *App*2 and *App*3 (dotted line) at the top, and to *Pm* and *Ss* (dotted line) below.



Conclusions and Discussion

Antibodies in 5 week old pigs probably reflected a fading maternal immunity, but already at 8 weeks antibodies to *Pm* were recorded in 23 % of the pigs. The reactions to *Pm* preceded those to *App*2, but increased further as pigs started to mount immune responses to *App*2. Thus, despite that the levels of antibodies to *App*2 remained at moderate levels, *App*2 may well have contributed to the pleuritis by giving access to the pleura for *Pm*. The high SDs obtained for OD-values to *Pm* indicated active infections, and that pigs got infected at different times. In contrast, the slowly rising OD-values and the low SDs rather indicated an increased background exposure to *Ss* with age.

The conclusion that *Pm* on site probably to a large extent contributed to pleuritis through amplifying fairly mild *App*-infections stress the impact of secondary infections. As *Pm* not is considered able to penetrate an intact mucosa, also an impact of other factors is implied. Mild viral infections of unknown origin have frequently been verified in young growers (4). Such infections may have contributed to the initial colonisation of *Pm*.

References

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