PSEUDORABIES IN SWINE

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I N T R O D U C T I O N

Psuedorabies (PR) is an acute, frequently fatal disease affecting a variety of domestic and wild species. The natural host and reservoir is the swine - species (Thawley Pork Ind). PR is caused by a Herpesvirus, classified as -- suid herpesvirus 1 (Brown 86). The development of clinical signs in swine - depend on the age of the animal. strain of the virus, and previous exposure. In pigs less than four week of age Pseudorabies virus (PRV) infection is -- primarily manifested as a central nervous disease. In older pigs PRV is often accompanied by respiratory signs. And in the breeding herd PRV might -- show as abortions, stillbirth and fetal death (Molitor 87).

PRV is world wide distributed. except for Australia and Canada. It is also known as Aujeszky's disease, Mad Itch and Paralisis Infecciosa Bulbar (Giron in EMF).

In the last ten to fifteen years the number of swine operations affected by the PRV has grown steadiliy in Europe and in the USA, Schnurrenberg reported the results from slaughter surveys in the U.S., and found an increase - in the prevalence of PRV from 0.56% in 1971 to 8.78% in 1983-84 (Schnurrenberg 84). The increase prevalence seen in the USA may have had an effect in the prevalence of Mexico due to the movement of animals for breeding purposes (Giron). The naturally occurring infections of PRV are estimated to cause multimillion dollar losses to the United States swine industry (Gustafson). PRV is also important as a model of study for herpervirus infection - in human beings. The purpose of the present article is to provide CP with - an overview of the current knowledge in vaccines, and the research being -- done at the U of Mn in this area.

SEROLOGIC PROFILES

Studies performed here at the University of Minnesota, have further investigated quarantined herds.

The first experiment, by Morrison et al, was a cross sectional study, with ten groups of ten pigs from 8 to 26 weeks of age. All pigs were bleed every four months and tested for the presence of Sero-neutralizing antibody - (SN) titer. There was no intervention, or treatment performed. The conclusion from this study are: In 4/11 herds, the virus spread had abruptly --- stopped in the grower/finisher area, suggesting that the virus was eliminated as the infected pigs were sold.

In other herds, 4/11, that had more than 350 sows, the virus continued to spread through-out the year tested. And in the other herds. 3/11, showed a pattern in between the other two profiles, pigs were positive and moved to negative and came back to positive (Morrison 88).

In the second experiment, 104 quarantined, farrow to finish swine herds -- were included. In most cases 29 finishing pigs were bleed from each herd - and tested for the presence of SN Ab titer, between 1979 and 1986. The conclusion are:
64% of the herds showed no evidence of virus circulation in the finishing pigs.

36% of the herds contained at least one seropositive pig. The factors associated with the presence of PRV in the finishing pigs were: Concurrent problems with Actinobacillus pleuropneumonia, feeding animal protein,confinement time since initial outbreak, and large herd size (Anderson 88).

VACCINES FOR PRV

The growing importance of PRV has stimulated research, development and marketing of vaccines that can help in the control of this disease. In USA and Europe there are several inactivated and modified live vaccines commercially available and widely used. Facts about vaccines for PRV:

1. Vaccination prevents the economical losses associated with PRV, but it does not prevent infection, replication or the establishment of latent infection of virulent virus (Tylor).

2. Vaccination will decrease the quantity and duration of virus excretion post challenge (Van Oirschot).

3. The presence of maternal Ab at the time of vaccination will interfere with the development of active inmunity (Van Oirschot).

4. The titer stimulated after vaccination does not indicate degree of protection against virulent virus (McFerran).

5. Some improved "new wave" MLV and a Sub unit vaccine have been produced that provide a mean to differentiate vaccinated animals from those naturally infected. This vaccine and the accompanying diagnostic test, ELISA, are specific, complementary for each other. The ability to differentiate such animals will permit continuous vaccination of swine herds simultaneously with clean up measures, such as test and removal and offspring segregation (Molitor 87).

6. There is some evidence suggesting that vaccination may increase the dose - require to infect a pig with PRV.

7. If an MLV is administered intra-nasally, it can stimulate local inmunity - at the natural portal of entry of the field virus.

The research done in this area at the U of M has concluded:
Intra-nasally vaccinated pigs are better protected against virulent PRV, indicated by decreased shedding, fewer fever days and better weight gain (Arellano).

SINGLETON REACTORS

As part of control and erradication program, herds are being monitored, ocasionally a single animal is detected to be seropositive, and when it occurs the entire herd is tested. In Minnesota 38 herds have been found since 1984 that feet this description of single reactors (Annelli 88).

This single reactors may occur through one of the four possibilities:
1. PRV has recently introduced and this pig is one of the first to sero-converted.
2. The herd may have been infected in the past, and this single reactor is the last to remain in the herd.
3. A false positive.
4. This single reactor is truly infected by an atypical strain of PRV, and may excrete the virus.

In a study done by Annelli et al (unpublished data) 3 of 4 herds that had single sero-positive animals, later had evidence of virus spread. This could be explained by: Sero-neutralization is able to detect latently infected animals, or because some PRV strains may be sufficiently low in virulence to produce infection, but has not spread and/or some management and/or environmental conditions may influence the incidence and severity of infection within herd. The appearance of single reactors is rare, but their importance may increase as an eradication program progresses (Annelli umpublish data).

SUMMARY

PRV is an important disease, which prevalence tends to increase. Some small hers may become seronegative, and it suggest that the virus can be eliminated from the grower/finishing area, as the infected pigs are sold. Large confine herds may pose as an important problem in the eradication of PRV, since the virus presence can be perpetuated in the herd, and it is associated with other respiratory diseases, APP. Vaccines can prevent the economical losses, but do not prevent infection with virulent virus. New MLV have been developed that allows to differentiate vaccinated pigs from naturally infected ones. The importance of single reactors in eradication programs was stressed.

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