Breakthrough in PMWS and circovirus control

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At last, a scientific breakthrough has been made in controlling the post-weaning multisystemic wasting syndrome (PMWS) that has plagued the pig industry over the last nine years.

Reports from the recent American Association of Swine Practitioners meeting in Orlando, Florida demonstrate conclusively that porcine circovirus type 2 (PCV2) vaccines have an outstanding protective effect on reducing mortality associated with the disease.

The disease was first reported in Canada in the mid nineties and then seemed to die out. It then spread across Europe in the late nineties and early 2000, and reached Asia at about the same time.

Initially, there was a high mortality of up to 30% in grower pigs as the infection swept through a herd and especially if there were other diseases present, such as PRRS virus, enzootic (mycoplasmal) pneumonia (EP) and virulent Actinobacillus pleuropneumoniae, particularly in Asia.

After this initial acute phase, herds settled back into a more stable chronic pattern but frequently the mortality never returned quite to normal and there was often an increase in lightweight pigs, even runts, which required euthanasia.

Early artificial infection studies with PCV2, in otherwise disease free pigs, caused some of the pathological changes but not repeatedly the whole disease syndrome seen in the field, hence the theory that there was possibly another agent, 'factor X', which caused a lot of confusion. This did not take into account that most farms have a variety of other endemic infections, especially EP and PRRSv (see Fig. 1).

A herd of pigs affected by porcine circovirus type 2 (PCV2) disease.

In Europe, many advances in the understanding of the pathogenesis of the disease have been made. The virus is spread by faeces to mouth, nose to nose and possibly by injection and semen. Once inside the pig, it targets the lymphoid cells of the immune system, which defend the pig against infections.

The virus replicates or grows slowly, so it takes some time for the disease to develop naturally. Other infections may enhance the virus's replication and thereby increase the immune system damage and reduce its ability to fight the other concurrent infections, making them exert a more damaging effect.

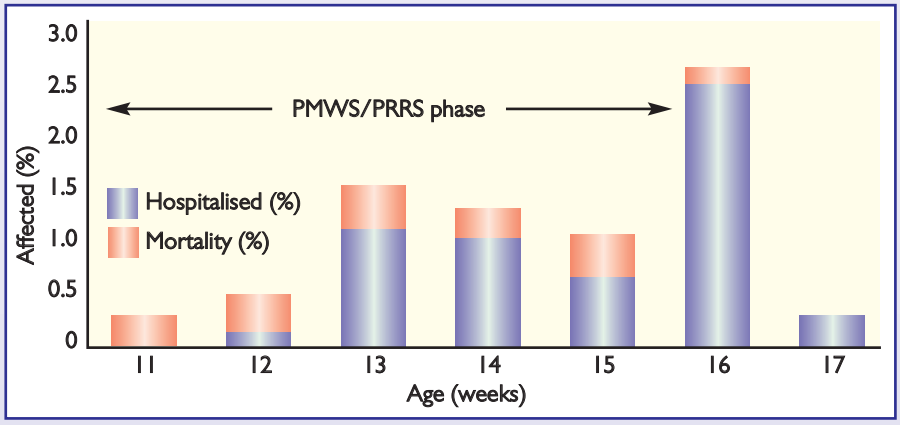
European farms have been able to reduce the mortality and lightweight pigs by reducing infection pressure on the pigs of PCV2 and other infections and reducing stress of mixing litters, moving and over crowding.

The sow herd's natural immunity has also been built up with time and maternally derived antibodies in the colostrum also offer some protection and have delayed the multiplication of the virus and the consequent severity of infection.

Still most pigs will develop a virus infection but the weight and severity of the infection is controlled and the effects are less, so that the majority of pigs can recover, with only a small check in production (see Fig. 2).

The reduction of viraemia, both in percentage of pigs affected and in viraemic levels, following vaccination were highlighted in the papers given at the AASV conference.

Fig. 1. PMWS and PRRSv infection in finishing pigs – barn mortality and hospitalisation of clinically affected pigs – half the hospitalised pigs died subsequently (Burch, 2006).



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The results of the new piglet vaccines recently used in north America are highlighted in Fig. 3.

There was an outstanding reduction in mortality especially in the finishing pigs, almost back to a 'normal' production level.

Most vaccination is started at three weeks of age, offering a very early priming protection to coincide with the decline in naturally occurring maternal antibodies.

Porcilis PCV2 was given twice at three and five weeks of age, but similar results appeared to be achieved with the single-shot vaccines of Ingelvac CircoFLEX and Suvaxyn PCV2 and protection appears to be provided over the whole life of the finishing pig.

In medical sciences there is a classical way of showing an organism is the cause of the disease in an animal or man, when it is infected by that organism and the disease is caused. The proof is termed fulfilling 'Koch's postulates'.

Now the north Americans have demonstrated a 'converse postulate' by using a vaccine against an organism and preventing the disease developing. It is hoped that as these vaccines are rolled out around the world, that at last this damaging disease can be brought under control. ■

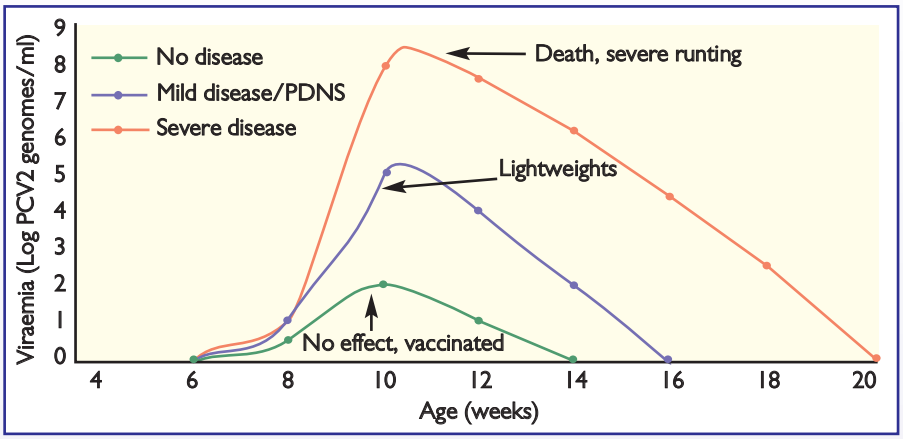

Fig. 2. Effect of level of viraemia on the severity of PMWS.

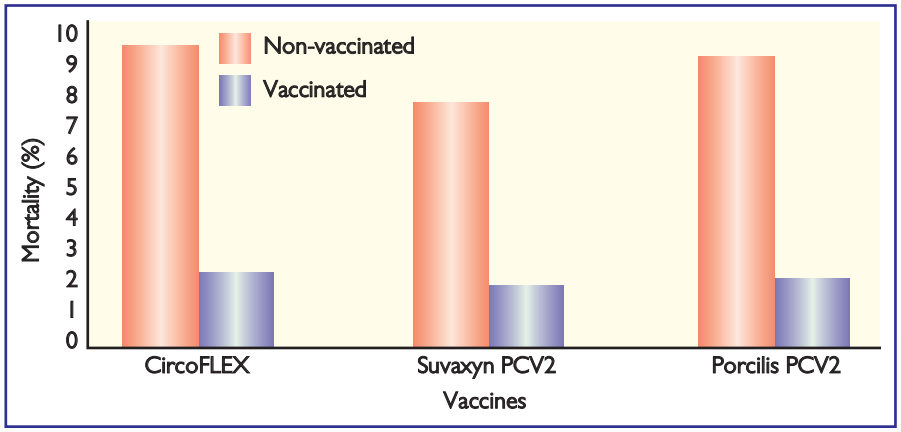

Fig. 3. Reduction in mortality in growers and finishers following vaccination with the new piglet vaccines.