PCVD Forum combines science and European field experiences

Merial recently hosted their PCVD Forum in Athens, Greece and 350 veterinarians and researchers from 20 European countries attended. A lot of interesting information was provided and rather than present this to our readers as a long article we have decided to use a new format based on infobytes and case studies. We hope you find the next couple of pages informative and thought provoking.

- Control of PCVD centres around good pig flow, controlling other diseases, optimising the environment, reducing stressors, decreasing challenge and vaccination against PCV2.
- PMWS and PCVD are syndromes and are not mono-factorial diseases.
- PMWS/PCVD can be controlled if have high levels of seropositive sows, wean at an older age and limit cross fostering.
- Having well validated and comparable tests for PCVD does not prevent their misuse or misinterpretation. The qPCR is not recommended for diagnosis and antibody responses (IPMA, ELISA and VNA) do not necessarily equate to pig protection.
- Risk of PMWS/PCVD is reduced if the piglet receives colostrum with a high level of maternal antibody to PCV2 and they are weaned at more than 20 days of age.
- Other practical measures to control PMWS/PCVD include high levels of external biosecurity, segregated production systems with all in-all out, removal of diseased pigs, high levels of hygiene, longer downtimes between batches of pigs, minimising overcrowding and limiting total pathogen load.
- Although many experts have postulated a role for Agent X in PCVD, none has been found!
- Intestinal and nasal mucosal tissues are the primary tissues for early PCV2 viral replication. Embryos and foetuses are sensitive to PCV2 infection and immunotolerance is induced. The heart is the main target organ.
- Different genotypes of PCV2 exist.
- Airborne spread of the disease has been confirmed.
- Severe lymphocyte depletion occurs in PCV2 infection and this makes the pigs more prone to secondary diseases.
- Maternal antibodies decrease as lactation progresses and following their disappearance in the progeny seroconversion to PCV2 normally occurs between seven and 12 weeks.
- PCV2 can persist for a long time in macrophages and this is a route by which the virus is disseminated to other tissues/organs. PCV2 protective macrophages can pass from sow to piglet at the beginning when the piglet's digestive tract is 'more open'.

Continued on page 9

Late stage/endemic PCVD

The manifestation of this condition varies but is typically seen at 60-80kg. Typical 'wasters' are seen as are many forms of pneumonia such as those associated with PRRS, PCV2, Mycoplasma hyopneumoniae and various bacteria. Sudden deaths are seen in good pigs. Other lesions include ear necrosis, PDNS lesions and granulomatous enteritis. Poor performance is common.

British swine practitioner Jake Waddilove highlighted four herds in which he had seen marked improvements following sow vaccination with Circovac. He showed that sow vaccination could have a real impact on the level and consequences of PCVD in finishing herds.

A 4,000 place finishing herd had PRDC involving PRRSV, M. hyopneumoniae, PCV2 and Actinobacillus pleuropneumoniae that was characterised by high mortality, poor and variable growth and high medicines usage. All the sows and gilts were vaccinated with Circovac six and three weeks before farrowing and on subsequent farrowings they received a booster three weeks before farrowing. All the sows were outside so vaccination was a real challenge! Following vaccination birth to slaughter daily live weight gain in the progeny improved from 540 to 567g per day and the killing out percentage increased from 76.4 to 77.4%. Average monthly mortality in the fatteners reduced from 2.0% to under 0.55 per month following vaccination and medication costs plummeted. Lungs showed reductions in pleurisy and viral lesions from 34 and 32 to 3 and 0% respectively and the M. hyopneumoniae consolidation score improved from 6.5 to 2.6.

A 300 sow multiplication unit in which most gilts were grown to about 100kg and the remainder of the progeny was sold at 30kg. The herd had a high health status. Even so, vaccination with Circovac significantly reduced finisher mortality but other benefits, such as improved uniformity, growth rate and selection rate, were seen. Clinically there was a marked reduction in low grade scour which suggests that this had been caused by a granulomatous enteritis.

A 600 sow farrow to finish unit experienced long term health problems associated with PRRS, M. hyopneumoniae, late stage PCVD, Haemophilus parasuis in weaners and Streptococcus suis in weaners/growers. Various vaccines and antibiotics had been used and environmental improvements had been made to the finishing unit, but each measure had met with little success. All sows and gilts were then vaccinated with Circovac at six and three weeks before farrowing and in subsequent cycles they were boosted three weeks before farrowing. Vaccination reduced total grower/finisher mortality from 5.0 to 1.3% and pleurisy, pericarditis and peritonitis were reduced from 30-60, 6-7 and 3-4% to 16, 2 and 1% respectively.

A 200 sow farrow to finish unit that was PRRS negative and M. hyopneumoniae positive had been PCVD affected for seven years. There was a Streptococcus suis problem in the weaners. After the sows had been vaccinated with Circovac there was a lower incidence of streptococcal meningitis in the weaners and the incidence of scour and PHE in finishers was dramatically reduced. Respiratory disease in finishers was reduced and mortality dropped to about 2%. Pigs were more even, growth rates probably improved and tylosin medication was withdrawn.

Dutch veterinarian, Cees Veldman, shared experiences from south east Holland – a pig dense area where typically 26 piglets per sow per year are produced with the best farmers achieving 31. In this area over the last five years no improvements have occurred in the fattening herds.

A farm of 740 sows and 7,600 fatteners. In the second half of the fattening period mortality was 3.5%, ADWG was 770g and coughing and other respiratory problems were encountered. Initially (May 2008) pigs were vaccinated with Circovac at 12 weeks of age but more recently (November 2008) pigs were vaccinated at eight weeks of age. Mortality reduced by 50% and antibiotic usage was significantly reduced.

A 1,400 sow operation was seeing a variety of problems in weaners and was receiving complaints (coughing, wasting, meningitis and elevated mortality) from the fattening units it supplied. Since October 2008 this operation has vaccinated all sows and piglets at six weeks with Circovac. Immediate improvements were seen in the fattening period and pre-weaning mortality fell from 13 to 9% and post weaning mortality dropped from 3.5 to 2.5%.

This farm housed 1,100 sows and 7,000 fatteners and was experiencing unacceptable mortality in its weaners and too much wasting among its fatteners. Following Circovac vaccination of the offspring at 10 weeks (now three weeks of age) daily growth rate increased from 810 to 835g per day, while mortality dropped from 3.1 to 2.9%. There was a noticeable improvement in FCR from 2.86 to 2.65, while the meat percentage rose from 55.9 to 56.5%. Antibiotic usage was significantly reduced.

A 5,400 fattener unit. Initially pigs were vaccinated at 10 weeks of age and now they are vaccinated at five weeks. Here daily growth and FCR deteriorated slightly, while there was a marked improvement in mortality from 4.5 to 2.8% and in meat percentage from 56.2 to 57.4% in the dry fed pigs. In the liquid fed pigs growth improved from 741 to 802g per day and mortality from 2.9 to 1.9%, while FCR improved from 2.67 to 2.40 and meat percentage remained constant at 56.1%. There was a marked reduction in the use of antibiotics.

Continued from page 7

- PCV2 can be associated with the immune cell the lymphocyte in some piglets but this is transitory. However, a persistent relationship is seen with monocytic cells in all piglets exposed to PCV2.
- Significantly more piglets are born to sows with low PCV2 antibody levels.
- Colostrum intake is pivotal to prevent PMWS, whatever the age of occurrence in pigs.
- Piglets with poor passive immunity against PCV2 were more likely to be clinically affected.
- PCV2 causes lymphoid lesions and compromised immunity, especially in young pigs and virus load and early exposure are directly linked to clinical signs.
- Vaccination of sows reduces their shedding of PCV2 virus and reduces the PCV2 challenge for the piglets.
- Circovac produces a strong, complete and long lasting immunity because of its very potent adjuvant.
- When vaccinating newborn piglets their immune systems are naive and specific responses take time to develop and maternal antibodies can interfere.
- Protection against PCVD relies on both cellular and humoral immunity and specific antibodies pass from the vaccinated sow via the colostrum to protect her piglets.

Dr Julien Avon from Brittany then shared some interesting findings in breeding animals following vaccination with Circovac.

The farm was a 140 sow farrow to finish operation with weaning at 21 days. Historically 80% of the piglets had ear necrosis and there was a chronic cough with a mortality rate of 2-3% per batch. Medication was of little value. From March 2008 all piglets were vaccinated with Circovac at weaning and a sow vaccination programme was started.

In the piglets there was a marked improvement in the cough, mortality went below 2% and the ear necrosis disappeared.

In the breeders the total born, born alive and weaned figures improved from 13.9, 12.6 and 10.5 to 14.2, 13.3 and 11.4 respectively and the stillborn figure reduced from 1.4 to 0.8. Overall Circovac vaccination reduced the % loss on total born and % loss on born alive figures from 24.4 and 16.2% to 19.7 and 14.6% respectively.

Professor Dr Zygmunt Pejsak compared the efficacy of three different vaccination protocols against PCVD on a Polish farm affected by the acute form of PCVD.

This was a 2,550 sow farrow to finish operation on which a batch of 110 sows was served each week. Piglets were weaned at 28 days and transferred to the fattening units at 90 days of age. The high infectious pressure on the unit involved PCV2, M. hyopneumoniae, Bordetella bronchiseptica, Pasteurella multocida, Actinobacillus pleuropneumoniae, Haemophilus parasuis type 2, and Streptococcus suis but the unit was free of PRRS and Aujeszky's disease.

The study involved three stages – the first stage was before the appearance of PMWS and involved six batches of sows and their progeny, the second phase was at the height of the PMWS outbreak, the third phase was when vaccination with Circovac was introduced. This involved three vaccination protocols each on six batches of sows and their progeny.

The trial and its results are summarised in the table below. Interestingly, some of the vaccination results are better than the pre-PMWS results suggesting a possible subclinical impact of PCVD.

Group	Sows	Piglets	No. sows	No. piglets	Mortality birth to kill (%)	Carcase weight (kg)	ADWG (g/day)	FCR
Before PMWS	-	-	651	6894	17.3	94.8	611	3.03
During PMWS	-	-	628	6169	28.8	92.5	569	3.30
Sow vaccination	Yes	No	636	6838	16.9	100.9	635	2.98
Piglet vaccination	No	Yes	653	7178	16.1	98.1	640	2.97
Sows & piglets vacc.	Yes	Yes	608	6058	15.4	98.6	656	2.99

- Colostrum contains lymphocytes. Piglets ingest 500 to 700,000,000 maternal cells each day and these can migrate across the gut barrier early in the piglet's life and can enhance non-specific and specific immunity in the piglets.
- PCV2 has been shown to be in semen.
- PCV2 in semen is able to induce reproductive failures, it can cross the uterine wall and not all piglets are infected.
- Canadian research has shown that PCV2 gets into the uterus of infected females.
- There is some evidence to suggest transplacental infection with PCV2.
- Embryos are susceptible to PCV2 infection and this can lead to embryonic death and abortion.
- PCV2 can spread among foetuses in utero. ■