

## Update on abortion storms and sow mortality

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**B**eginning in late summer 1996, increased disease outbreaks described as severe porcine reproductive and respiratory syndrome (PRRS), atypical PRRS, "swine abortion and mortality syndrome" (SAMS), or Southeast Iowa abortion syndrome were reported to diagnostic laboratories. Most of the reports were from Southeast Iowa; however, cases also have been identified in Minnesota, Illinois, North Carolina, Colorado, Missouri, Nebraska, and elsewhere.

The clinical outbreaks are characterized by mid- or late-term abortions of 10%-50% of the herd in a 3- to 6-week period. Sows and gilts are anorexic and have fevers of 104-106°F (40-41°C) for 2-4 days. Sow and gilt mortality is sometimes markedly increased with death loss of 5%-10% of the breeding herd inventory during the episode. Most of the herds also experience increased preweaning mortality and decreased nursery pig performance, primarily due to respiratory disease. Outbreaks usually progress through the production system for approximately 1-3 months, followed by a return to normal or near prebreak production performance.

In most cases, acutely affected sows have microscopic lesions typical of PRRS, including proliferative and lymphohistiocytic interstitial pneumonia, lymph node hyperplasia, lymphoplasmacytic meningoencephalitis with vasculitis, lymphohistiocytic endometritis, and myometritis. In a few cases, multifocal necrotizing and lymphohistiocytic hepatitis is also observed in pregnant adults and less often in nursery pigs. PRRS virus (PRRSV) antigen usually can be demonstrated by direct-fluorescent antibody or immunohistochemical examination of the reproductive tract, tonsil, lung, and less often the brain. Some of the sows also have concurrent bacterial endometritis and septicemia as a result of retained fetuses.

PRRSV serum antibody levels in the sows as measured by ELISA are often in the S:P ratio range of 2.5-4.0 at the time of abortion. Paired sera may be necessary to demonstrate seroconversion to PRRSV and to detect other pathogens. PRRSV is usually isolated from the tissues, pulmonary lavage fluid, or sera of the affected animals.

The preferred diagnostic samples in cases of undiagnosed PRRS-like abortion are live sows and pigs in the acute stage of disease. If tissues are collected, samples should include sera (from presuckle weakborn pigs if possible), lung, brain, liver, spleen, kidney, lymph nodes, and tonsil. Sow tissue submissions should include brain, tonsil, heart, lung, liver, lymphoid tissues, uterus, ovary, and placenta. Submission of

fetuses alone is much less successful for PRRS diagnosis because virus is rapidly inactivated by fetal autolysis. Fetuses, placenta, and umbilical cord should be submitted to investigate PRRS and other causes of abortion.

Most of the PRRSV isolates from recent cases are field isolates (wild type) when tested by restriction fragment length polymorphism (RFLP) analysis. The wild type isolates most often have a "1-4-2 cut" pattern by RFLP. In a few cases, the only isolate recovered is determined to be "vaccine-like" by RFLP. Recovery of only a "vaccine-like" isolate may reflect preferential growth and selection for the cell-culture-adapted vaccine strain from vaccinated animals. Additional samples such as presuckle sera from weakborn pigs or pulmonary lavage fluid may be necessary to recover wild-type virus in the herd.

To date, most evidence suggests that the abortion syndrome is due to a severe manifestation of PRRSV. The fact that the outbreaks occur in seemingly well-vaccinated herds suggests the presence of immunologically naive animals in the herd or might indicate a lack of cross protection between vaccine and certain field strains of PRRSV. The unusually severe meningoencephalitis lesions in some cases and the unique hepatitis lesions in a few of the cases suggests that there could be additional pathogens, toxins, or immunopathogenic processes involved in some cases, but these observations require further study.

The National Pork Producers Council (NPPC), AASP, United States Department of Agriculture Animal and Plant Health Inspection Services, and veterinary diagnostic laboratories are conducting an epidemiologic field study in an effort to resolve some of the questions surrounding the episodes of severe reproductive failure. The epidemiological study will include collection of:

- diagnostic samples from affected breeding herds,
- herd management information via a questionnaire, and
- key production parameters from selected farms.

The goal of the study is to assess the role of PRRSV in the recent outbreaks and determine risk factors associated with episodes of severe reproductive failure.

Research on PRRS continues to be a priority of the NPPC. The NPPC responded to the recent abortion outbreaks by creating a special round of research funding. Grants to study PRRS and to investigate other factors associated with the abortions were awarded in March 1997 to researchers at several universities. Another call for PRRS research proposals will be distributed in May 1997.

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