International Pig Topics

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Swine influenza VI

Cellular immunity

Cellular immunity plays an important role in clearing swine influenza virus from the pig and its recovery from infection. Cellular immunity is also thought to play a role in heterologous immunity against low dose infections of influenza A virus.

CD4+ or T-helper cells facilitate both antibody response, but after primary and secondary infection there is an increase in CD8+ cytotoxic T-lymphocytes in the lungs of pigs infected with influenza A virus. At the same time there is an increase in natural killer cells in the lungs. These natural killer cells destroy influenza A virus infected epithelial cells in the early stage of primary infection in a non-specific manner but in the later stages of primary infection and in secondary infection they are probably targeted to infected lung cells by antibodies.

Strong T-cell responses (measured by interferon-γ-producing cells) have also been encountered in trachebronchiolar lymph nodes and spleens shortly after infection. Their role tends to decline after three weeks.

Maternally derived immunity

Transfer of immunity to piglets from their mothers occurs via the colostrum. Colostrum is very important since the sow's placenta prevents the transfer of antibodies to her embryonic piglets in the womb.

Maternally derived antibody is important for the clinical protection of the piglet but it can interfere with the development of an effective immune response against influenza A virus in the piglets. Maternal antibody is at its peak immediately after intake and declines over the next 4-14 weeks.

Maternal antibody can give complete protection against a homologous challenge with influenza A virus, but other studies have shown only a partial protection accompanied by a reduction in clinical signs and virus shedding. Pigs with maternal antibodies shed virus for a longer time after challenge infection and show a reduced DLWG compared to pigs with no maternal antibody.

The presence of maternal antibody can be associated with reduced antibody responses and an overall weaker immune response.

The efficacy of inactivated or live vaccination is reduced by the presence of maternal antibody. The presence of maternal antibody at the time of vaccination can result in fever and prolonged clinical signs and pigs with maternal antibody can have a more severe pneumonia than pigs without antibody present.

Influenza A virus transmission can be reduced, but not eliminated, in young piglets with homologous maternal immunity.

Antigenic drift has been seen in pigs with maternal immunity.

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