

The correct early recognition of herd's health problems and their regular monitoring is the key to the profitable production of good quality pork and, through proper management (eradication and prevention programs), ensuring maximum welfare for the animals. Investigating the possibility of using new, non-invasive, simple and cheap methods of sampling may in the future lead to the development of new diagnostic strategies. Currently, serum, oral fluid as well as nasal swabs, tissue and organ samples are used most often in the diagnosis of swine viral diseases. Collecting them is labor-intensive and costly and some of these samples can only be obtained from dead animals. The aim of this study is the investigation on piglet processing fluid (PF), an alternative medium collected in, which could replace traditional matrices. Blood sampling is fraught with high risk in very young piglets and obtaining oral fluid is not always possible. Processing fluid consists of blood and serum obtained during castration and tail-docking (piglet processing), which is usually performed during the first week of life (3-5 d). The use PF for the surveillance of viral diseases in breeding herds and in suckling piglets is not well studied yet. Non-invasive material collection or the use of material that has been utilized so far (e.g. testes after castration, tails) for diagnostic purposes reduces the stress associated with the animal restraining, necessary for blood collection - the most commonly used medium collected from live animals for diagnosis and monitoring the health status of the herd. In addition, using samples obtained in every herd with a full production cycle during routine procedures (e.g. piglet processing) for diagnostic purposes allows for significant savings in time, work and costs, and improves production profitability.

The subject of the study is evaluation of the possibility of detecting two porcine viral pathogens in PF, important for scientific and economic reasons: the porcine reproductive and respiratory system virus (PRRSV) and porcine circovirus type 2 (PCV-2). Porcine reproductive and respiratory syndrome (PRRS), caused by PRRSV is one of the diseases causing the greatest losses in modern pig production. PRRS may affect several stages of swine production cycle due to increased abortion and mortality rates in pre- and post-weaning pigs, reductions in total weaned pigs, reproductive failure in sows or lower feed conversion in feeder pigs. PCV-2 is another pathogen responsible for significant economic losses in the global pig industry, which are related to increased mortality, culling rates, and poor growth in growing pigs.

The study will assess the usefulness of PF for diagnostics, epidemiological and monitoring studies regarding PRRSV and PCV2. The tests will include both individual and pooled samples (assessment of sample pooling options). In addition, an attempt to develop a procedure enabling the use fluid from tails only in molecular studies will be made. Tails are available from males and females, also in immunologically castrated herds. The results obtained will be confronted with the serum results (reference method). Besides, the correlation between the PF results, piglet serum and mother serum (degree of agreement between these two technology groups) will be examined. By confronting the obtained results (antibody levels) with the assessment of health and production parameters of piglets, the possibility of using PF to evaluate the supply of piglets with maternal antibodies (lactogenic immunity) and colostrum intake will be verified for the first time. The possibility of using PF to assess the role of piglets in the persistence and circulation of these pathogens in the herd will be also studied.

The collected samples will be tested using commercial real-time polymerase chain reaction (PCR) tests to detect genetic material of the viruses, and commercial ELISA kits to detect antibodies against the mentioned above viruses. The tests will be performed according to manufacturers' recommendations. Then the statistical analysis of the results will be performed.

Thanks to demonstrating the usefulness of PF in laboratory diagnostics, surveillance of swine health could be carried out to a greater extent, regularly, without generating additional work and costs of treatment. The obtained results may constitute the basis for the implementation of new diagnostic strategies for surveillance of swine viral diseases in the future. This is important not only for protection of animal health, but taking into account that pigs are raised commercially for meat, also or especially, for the protection of public health.