Influenza A Virus Research Update – USA
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- Reserch Goal: To understand how population dynamics, immunity and farm managements factors affect influenza transmission in order to develop protocols to control and eliminate the disease
  - Influenza in the sow herd
    - Role of nurse sows
    - Role of sows during lactation
    - Parity
    - Management factors and interventions to decrease transmission
    - Mechanical transmission by people
    - Bi-directional transmission between people-pigs
  - General summary statements of research findings
    - Sows are not a significant source of influenza at farrowing.
    - Sows become infected during lactation (i.e., piglets are the source of infection).
    - Influenza infections can start very soon after piglets are born
    - Limiting pig and changing farm protocols (e.g., no cross-fostering after processing, handling of the pigs with new/clean gloves, plastic boot covers if entering crates, no nurse sows) can help decrease transmission but prevalence at weaning was not altered
    - Fomites and hands of personnel may be a main driver of influenza spread
    - Interventions should be implemented at the farm level since interventions at the room level are not enough to fully stop transmission between rooms. Vaccination is critical to help decrease infection levels

ABSTRACT

- Albert Canturri,Gustavo Lopez, My Yang, Emily McDowell, Montserrat Torremorell. Comparative study to detect influenza A virus by RT-PCR using 5 different types of udder skin wipes and piglet nasal wipe. 2020 Allen D. Leman Swine Conference. Research Abstract 27

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Comparative study to detect influenza A virus by RT-PCR using 5 different types of udder skin wipes and piglet nasal wipes

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Key points

Various wipe types can be used to sample IAV from the udder skin of lactating sows. Although differences between wipe types were not seen, wipes that were wet provided a better detection rate than dry wipes.
Furthermore, wiping the nose of 5 piglets within a litter resulted in higher litter detection rates than sampling the udder directly. This indicates that within litter prevalence is a driver for IAV detection using wipes.
Future steps are needed to assess differences in virus isolation among sampling procedures.

Introduction

Non-invasive group sampling strategies such as the collection of udder skin wipes are increasingly used in active influenza A virus (IAV) surveillance programs in breeding herds. Nasal wipes have been used as an individual sample in piglets, but they have not been adopted widely as a group sample where sampling different animals of the same litter occurs with the same wipe. The objectives of this study were to compare the detection rates of IAV by rRT-PCR among five different types of udder wipes and evaluate the detection rate of udder wipes compared to a composite sample of nasal wipes obtained by sampling five piglets.

Materials and Methods

Five types of wipes with different fabric substrates and liquid media combinations of gauzes and liquid media were prepared as depicted in table 1. Thirty litters per wipe type were selected (n=150 total) and selection of litters was done by systematically selecting litters within a farrowing room. Samples were collected by wiping the underline of sows between 3 and 6 days prior to weaning. In litters sampled with the MEM based media, an additional nasal wipe was obtained from 5 piglets in the litter selected randomly. After collection, all samples were refrigerated, transported to the laboratory and tested individually by rRT-PCR to detect the IAV matrix gene. Results were considered positive when cycle threshold (Ct) values were ≤ 35 and differences were compared using the Pearson's Chi-square test.

Wipe type	Preparation
1	3 x 3 in. cotton gauze moistened with 8 ml MEM-based media
2	3 x 3 in. cotton gauze moistened with 8 ml PBS
3	Swiffer dry cloth moistened with 25 ml PBS
4	Baby wipe moistened with 8 ml PBS
5	3 x 3 in. cotton dry gauze with 8 ml PBS added after sampling

Table 1. Composition of the 5 different types of wipes depending on their fabric substrates and media combinations

Results

Out of the 150 litters sampled, 64 tested positive (43%). The wipe type that yielded the highest proportion of positive litters was the MEM-based media wipe (16/30; 53%), followed by Swiffer (15/30; 50%). The wipe that yielded the lowest proportion of positive litters was the dry wipe (9/30; 30%), as shown in table 2. However, differences among wipe types were not significant (p-value = 0.38) and there were no differences between average Ct values of positive samples or the parity of the sow. In addition, detection of IAV positive litters was significantly higher when using the composite sample of nasal wipes collected from 5 pigs (27/30; 90%) than using udder wipes (16/30; 53.3%) (p-value < 0.01), as detailed in table 3.

Type of wipe	Proportion of positive samples	Average Ct value within positives
1	16/30 (53%)	31.79
2	12/30 (40%)	30.29
3	15/30 (50%)	31.26
4	12/30 (40%)	31.47
5	9/30 (30%)	32.57
Total	64/150 (43%)	31.43

Table 2. Detection rates and average Ct value among the five different types of wipes.

Type of wipe	Proportion of positive samples	Average Ct value within positives	Chi-square p-value
MEM-based Udder wipe	16/30 (53.3%)	31.79	P=0.004171
MEM-based Nasal wipe	27/30 (90%)	30.23	

Table 3. Detection rate differences using udder or nasal wipes within the same litters using MEM-based media wipes