

Abstract #: 270

SWINE INFLUENZA - RESULTS FROM ROUTINE DIAGNOSTICS

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Influenza A virus (IAV) causes a respiratory disease in swine with high morbidity but low mortality. IAV is divided into subtypes defined by the combination of the surface glycoproteins hemagglutinin (18 HA) and neuraminidase (11 NA). In Europe, the most prevalent subtypes are H1avN1, H1huN2, H3N2, H1pdmN1, and (recently) H1pdmN2, with reassortments possible.

This survey analyzed routine diagnostic results both serologically, by ELISA and hemagglutination inhibition (HI) test, and by real-time RT-PCR.

During the first half of 2018, a total of 4566 and 9874 swine serum samples was tested by competitive ELISA or HI, respectively; a further 5453 samples (66.0% nasal swabs; 19.1% oral fluids; 10.4% lungs) were tested by SIV-PCR. Another 816 samples were subtyped by multiplex real-time PCR targeting different genes for HA and NA. Different Influenza A strains of the 5 most predominant subtypes in Europe were used as antigens for HI testing. Data were analyzed according to age group and country of origin.

The percentage of positives ranged from 26.3% (HI) to 56.9% (ELISA). Most of the sera analyzed by HI were from sows (64.7%), whereas most tested by ELISA were from fatteners (50.3%). Most samples tested by PCR were from piglets (40.6%) and fatteners (31.1%). The distribution of subtypes differed both according to testing method (HI or PCR) and country of origin. In Germany, the dominant subtypes in HI results were H1avN1 and H3N2. The most frequent subtypes found by PCR were H1avN1 in Germany, France, and the Netherlands, followed by H1huN2 and H1avN2 in Germany and France.

These data represent a concise overview of the occurrence of different SIV subtypes in domestic swine in Germany and other European countries.

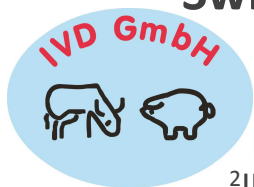
However, the reasons for the variation in subtype distribution should be analyzed further, considering countries, vaccination status, multiple Influenza infections, and animal age.

Swine Influenza - Results from Routine Diagnostics

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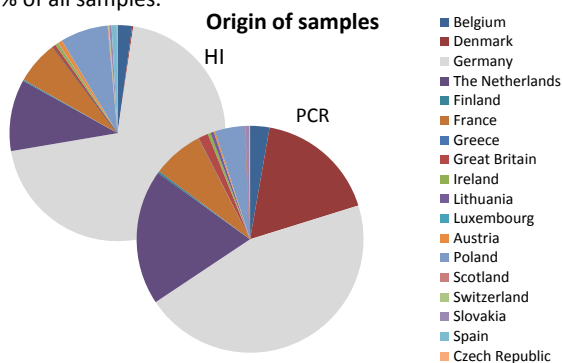
Introduction and Objectives:

Influenza A virus (IAV) causes a respiratory disease in swine that is of high morbidity but low mortality. IAV is divided into subtypes defined by the combination of the surface glycoproteins hemagglutinin (18 H) and neuraminidase (11 N). In Europe, the most prevalent subtypes are H1avN1, H1huN2, H3N2, H1pdmN1, and (recently) H1pdmN2, with reassortments possible.

This survey analyzed routine diagnostic results both serologically, by ELISA and hemagglutination inhibition (HI) test; and by real-time RT-PCR.

Materials and Methods:

During 2018, a total of 8069 and 20370 swine serum samples was tested by competitive ELISA (ID Vet) or HI (titer ≥ 80 assessed positive), respectively; a further 8409 samples (62.8% nasal swaps; 20.2% oral fluids; 11.1% lungs) were tested by SIV-PCR. Of these samples, 651 were subtyped by multiplex real-time PCR targeting different genes for H and N. Different Influenza A strains of the 5 most predominant subtypes in Europe were used as antigens for HI testing. Data were analyzed according to age group and country of origin. Information about the age group was provided for only 46.3% of all samples.



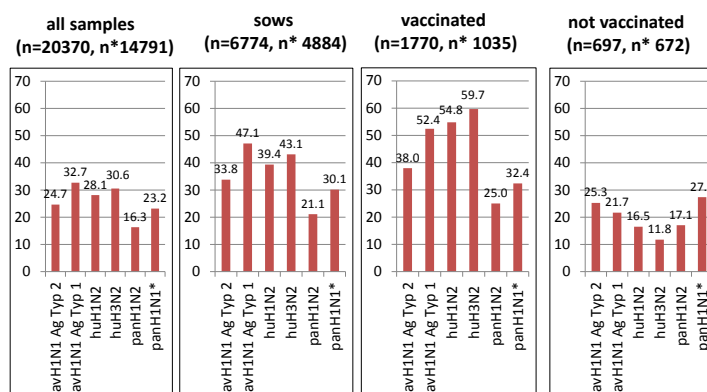
Most samples came from Germany, but substantial numbers were also sent for HI testing from The Netherlands (10.7%), Poland (7.0%) and France (6.5%).

Most samples for PCR testing came from Germany (45.5%), The Netherlands (19.3%), Denmark (17.4%), France (7.3%), Poland (4.3%) and Belgium (2.8%).

Results:

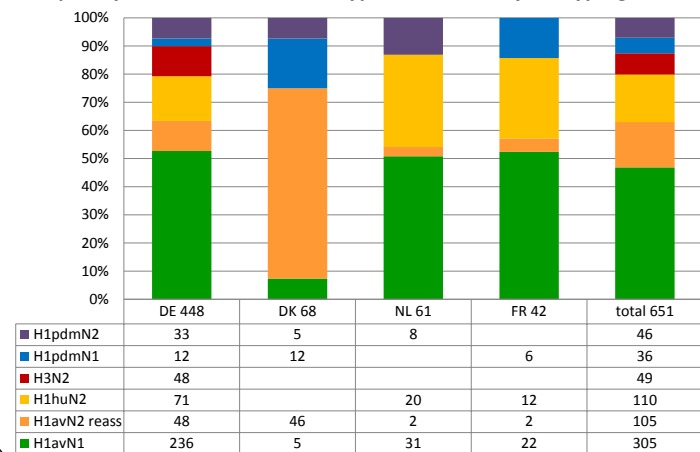
The distribution of subtypes differed both according to testing method (HI or PCR) and country of origin.

Percentage of sera with titer ≥ 80 for the different influenza virus subtypes tested by HI

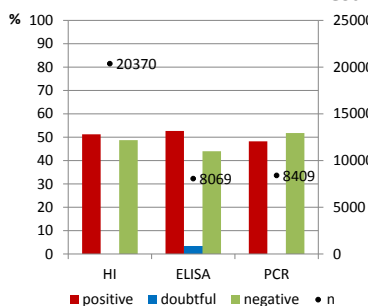


In Germany, the dominant subtypes in HI results were H1avN1 and H3N2. The most frequent subtype found by PCR was H1avN1 in D, F, and the NL, whereas this was H1avN2 in DK. About a quarter of the samples was not clearly typeable for different reasons, ranging from high ct (low virus load) to possible mismatches of primer sequences.

Frequency of influenza virus subtypes identified by subtyping PCR



Results:



The percentage of positives ranged from 48,3% (PCR) to 52.7% (ELISA). Of the samples with information about age group most analyzed by HI were from sows (66.2%), whereas most tested by ELISA were from fatteners (48.8%). Most samples tested by PCR were from piglets (41.8%) and fatteners (32.8%).

Conclusions:

- Between 48 % and 53 % of all samples tested positive for swine influenza.
- The serological results are influenced by animal age and vaccination status, and the results of PCR testing confirm both the influence of time of sampling (acute phase disease) as well as animal age.
- The frequency of the SIV subtypes in domestic swine differs in the various countries of origin.

References:

Henritzi, D. et al. (2016): Rapid detection and subtyping of European swine influenza viruses in porcine clinical samples by haemagglutinin- and neuraminidase-specific tetra- and triplex real-time RT-PCRs. Influenza Other Respir. Viruses. 2016, 10, 504-517

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