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Influenza A surveillance in the pig population (1991-2007) of Great Britain

Sharon Brookes¹, Steve Essen¹, Linzy Outtrim¹, Rebecca Gardner¹, Alabla Akande², Richard Irvine² and Ian Brown¹

¹Veterinary Laboratories Agency, Weybridge, Addlestone, Surrey KT15 3NB, UK.
²Royal Veterinary College, London /3 Haynes Rd, Dagenham, Essex RM8 2SX.

1

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Introduction

- The detection of swine influenza virus (SwIV) in the pig populations of GB has been monitored since the late 1980's but more routinely since 1991.
- There have been 3 endemic subtypes, only 2 currently circulating, and 5 other virus subtypes detected over the last 17 years.
- Avian-like H1N1 and H1N2 are the current subtypes that predominate in GB and across Europe. H3N2 and classical swine H1N1 also still occur on the continent.
- Zoonoses - at least 50 cases involving mainly H1N1 but also H3N2. None detected in the UK, but no active surveillance occurs.

2

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Methods

- Scanning surveillance samples for virus isolation (tissue – lung, trachea & tonsil) were submitted following clinical suspicion of respiratory disease from field veterinarians to the VLA Regional Laboratories.
- Submission Form - (accessed 18 Feb 08).
<http://www.defra.gov.uk/corporate/regulat/forms/VLA/vla3.pdf>
- Virus isolation was performed in embryonated chickens eggs (9-11 days old).
- The HA subtype of each virus was determined by haemagglutination inhibition tests (HAIT) for candidate viruses;
 - classical (A/sw/England/86)
 - avian-like H1N1 (A/sw/Finistere/82),
 - H1N2 (A/sw/Scotland/94)
 - H3N2 (A/sw/Gent/84).

3

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Results I

1991 - 2007, 2151 samples were tested (range; 27-275 p.a.)
 a total of 292 positives, 13.5% (range p.a., 5.6-25.5%).
Isolated viruses include three subtypes;

- Av H1N1 (n=2220, 75.3%), in declined since 1992 (23%-4.8%),
- H1N2 (n=43, 14.7%), peaked in 1998 (9.8%), last detected May 2006
- H3N2 (n=29, 10.0%), last detected in 1997.

4

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Results II

- Demographics subset - 1998-2006, n=986 samples
 - proportion per pig population, geographical distribution, seasonality, pig age, clinical signs and inter-current disease.
 - 107 (10.9%) influenza positive samples and 879 (89.1%) negatives.

5

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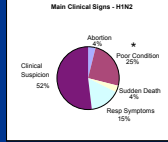
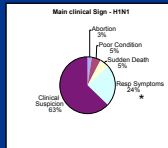
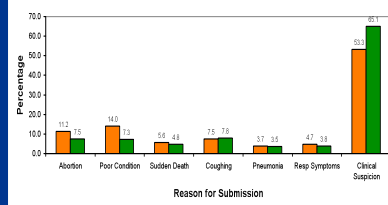
Seasonality

SI is generally more prevalent in the colder months associated with virus survival, temperature, humidity and husbandry conditions

6

Main clinical sign at submission

Percentage Positive / Negative - Main Clinical Signs

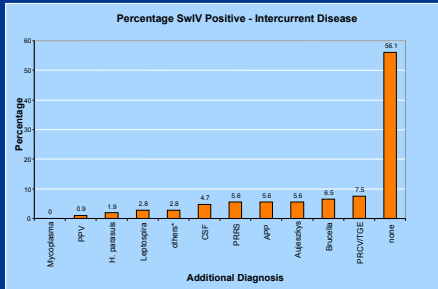


- Piglets exhibit fever, coughing, pneumonia
- Adult sows exhibit fever linked to abortion, stillbirths & premature births, loss of condition, coughing and pneumonia
- Weaners and growing pigs can become prostrate, have laboured breathing, coughing secondary pneumonia inter-current disease.

10

Inter-current disease in SwIV positive animals

Percentage SwIV Positive - Intercurrent Disease



The majority of the inter-current infections were found in av-H1N1 infected pigs (31.6%) compared to H1N2 infected animals (7.7%).

11

Summary

- Av-like H1N1 continues to be the most prevalent virus in GB, H1N2 in decline (2006-) and H3N2 no longer detected (1998).
- Positives mimic submissions & most occurring Jan-June from high pig density areas.
- Weaners are the most common age group for SwIV isolation.
- Clinical suspicion, respiratory signs (av-H1N1) & loss of condition (H1N2) are the most prevalent submission criteria.
- Inter-current disease is more common in with av-H1N1 than H1N2.

12

Summary / Conclusions

- SwIV surveillance in pigs in GB since 1991 has demonstrated the changing epidemiology of SI that can often show significant differences from that on the European continent.
- The programme has provided information on
 - i) predominance of avian-like swine H1N1 virus
 - ii) the emergence of swine H1N2 virus coincident with the apparent disappearance of human-like swine H3N2 viruses,
 - iii) current co-circulation of avian-like swine Av-H1N1 and swine H1N2
 - Is H1N2 also disappearing?
 - vi) no evidence for other virus subtypes circulating in GB swine that have been described elsewhere; Asia and the Americas
 - vii) demographic differences between subtypes: av-H1N1 & H1N2
- Swine influenza surveillance is an ongoing requirement if the incursion of new and emergent viruses are to be detected prior to economic loss and / or interspecies transmission, including zoonoses.
- Analysis is totally reliant on the quality of submission data provided

13

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14
