

The surveillance and control programme for specific virus infections in swine herds in Norway

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Surveillance in 2008 did not detect any cases of Aujeszky's disease, transmissible gastroenteritis, porcine respiratory corona virus, porcine respiratory and reproductive syndrome or swine influenza.

Introduction

The national surveillance and control programme for specific virus infections in swine was launched in 1994 in order to document the status of Aujeszky's disease (AD), transmissible gastroenteritis (TGE), and porcine respiratory corona virus (PRCV) in the Norwegian swine population. Porcine respiratory and reproductive syndrome (PRRS) and swine influenza (SI) were included in the programme in 1995 and 1997, respectively. From 1997 to 1999 porcine epidemic diarrhoea (PED) was also included (1), (Table 1).

The Norwegian Food Safety Authority is responsible for running the programme, while the National Veterinary Institute is responsible for planning, laboratory analyses and reporting.

The EFTA Surveillance Authority (ESA) has recognised the swine population in Norway as free from AD since July 1 1994, and has defined additional guarantees to protect the swine health status in Norway. The additional guarantees relating to AD for pigs destined for Norway are described in ESA Decision 75/94/COL, amending ESA Decision 31/94/COL, later replaced by ESA Decision 226/96/COL.

Aims

The aims of the programme are, through serological surveillance, to document absence of specific infectious diseases in the Norwegian swine population and to maintain this favourable situation.

Table 1. Monitoring of the Norwegian swine population for antibodies against Aujeszky's disease (AD), transmissible gastroenteritis (TGE), porcine respiratory corona virus (PRCV), porcine epidemic diarrhoea (PED), porcine respiratory and reproductive syndrome (PRRS) and swine influenza (SI) during the years 1994 to 2008

| Year | Herds in population | Herds tested | Animals tested | Animals positive | Diseases included |
|--------------|---------------------|--------------|----------------|------------------|---------------------------|
| 1994 | 7,799 | 1112 | 12,010 | 0 | AD, TGE, PRCV |
| 1995 | 7,471 | 956 | 11,197 | 0 | AD, TGE, PRCV, PRRS |
| 1996 | 7,045 | 468 | 4,968 | 0 | AD, TGE, PRCV, PRRS |
| 1997 | 6,661 | 512 | 4,925 | 0 | AD, TGE, PRCV, PRRS, PED, |
| 1998 | 6,275 | 491 | 4,695 | 2* | AD, TGE, PRCV, PRRS, PED, |
| 1999 | 5,761 | 470 | 4,705 | 0 | AD, TGE, PRCV, PRRS, PED, |
| 2000 | 4,827 | 458 | 4,600 | 0 | AD, TGE, PRCV, PRRS, SI |
| 2001 | 4,554 | 472 | 4,972 | 0 | AD, TGE, PRCV, PRRS, SI |
| 2002 | 4,150 | 492 | 4,899 | 0 | AD, TGE, PRCV, PRRS, SI |
| 2003 | 4,005 | 483 | 4,783 | 0 | AD, TGE, PRCV, PRRS, SI |
| 2004 | 4,006 | 492 | 4,935 | 0 | AD, TGE, PRCV, PRRS, SI |
| 2005 | 3,762 | 468 | 4,644 | 1* | AD, TGE, PRCV, PRRS, SI |
| 2006 | 3,339 | 457 | 4,569 | 0 | AD, TGE, PRCV, PRRS, SI |
| 2007 | 3,010 | 456 | 4,641 | 0 | AD, TGE, PRCV, PRRS, SI |
| 2008 | 2,682 | 487 | 4,845 | 0 | AD, TGE, PRCV, PRRS, SI |
| Total | | | 85388 | 3* | |

* 2 positive for SI H3N2 in 1998 and 1 positive for PRCV in 2005, probably unspecific reactions.

Materials and methods

All the 132 nucleus and multiplying herds were to be tested. In addition, the nucleus units of all the 13 sow pools and a random selection of the remaining swine population were included in the programme. The random selection was conducted from all swine herds receiving governmental production subsidies according to records of 31 July 2007. The register contains 2,682 commercial swine herds, of which 313 integrated and piglet-producing herds and 60 fattening herds were selected.

The counties Østfold, Akershus, Vestfold and Rogaland were considered to be "high risk areas", and a relatively larger proportion of farms from these counties were selected.

Samples were collected at the farms, except for the fattening herds, which were collected at six different abattoirs. From all herds, samples from ten pigs were to be collected.

Aujeszky's disease

All serum samples were tested for antibodies against AD virus using a commercial blocking ELISA (SVANOVIRTM). The test detects antibodies against glycoprotein B (previously glycoprotein II) on the surface of the virus. For follow up of positive or dubious results, the SVANOVIRTM PRV-gE was used.

Transmissible gastroenteritis virus and porcine respiratory coronavirus

A combined blocking ELISA (SVANOVIRTM) was used to detect antibodies against TGEV/PRCV. Depending on the reaction pattern of two different monoclonal antibodies against TGEV/PRCV and TGEV respectively, the test is able to distinguish between antibodies against TGEV and PRCV.

Porcine reproductive and respiratory syndrome

All serum samples were tested for antibodies against PRRS virus using the HerdChek PRRS 2XR Antibody Test Kit (IDEXX) which detects the most predominant European or American type of PRRS viruses. In the case of dubious or positive results, the samples were retested with blocking ELISAs and immune-peroxidase tests (IPT) at the National Veterinary Institute in Denmark.

Swine influenza

To test for swine influenza, the samples were analysed for antibodies against the serotypes H1N1 and H3N2 in the hemagglutination inhibition test (HI), according to the method described in the OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals (2). The antigens were produced at the National Veterinary Institute in Oslo.

All the serological analyses were performed at the National Veterinary Institute in Oslo. All inconclusive or positive samples in the routine tests were re-tested by specified reference tests.

Results

Blood samples from 4,845 individual animals were submitted and the results are shown in Table 2. The distribution of tested herds in relation to type of production is given in Table 3. The mean number of animals tested per farm was 10 (range 5 - 65).

Table 2. Number of samples submitted to the laboratory and the test results for AD, swine influenza, and PRRS, PRCV and TGE in 2008

| Disease | Received | Rejected | Negative | Positive |
|---------|----------|----------|----------|----------|
| AD | 4,845 | 3 | 4,842 | 0 |
| SI | 4,845 | 2 | 4,843 | 0 |
| PRRS | 4,845 | 52 | 4,793 | 0 |
| TGE | 4,845 | 7 | 4,838 | 0 |
| PRCV | 4,845 | 7 | 4,838 | 0 |

Table 3. Distribution of swine herds in the surveillance and control programme 2008 related to the type of production

| Category | No. of herds tested | Total no. of individual samples collected |
|---------------------------------------|---------------------|---|
| Nucleus herds and multiplying herds | 122 | 1,254 |
| Sow pools | 12 | 125 |
| Integrated and piglet-producing herds | 287 | 2809 |
| Fattening herds | 66 | 657 |
| Total | 487 | 4,845 |

Discussion

The results from the surveillance and control programme support freedom from specific virus infections in the Norwegian swine population. Antibodies against any of the specified viruses have been detected only twice since the start in 1994. A low level of antibodies against swine influenza (H_3N_2) was detected in samples from pigs in one herd in 1998, and one out of ten pigs from a fattening pig herd had antibodies against PRCV in 2005. To date, there have been no clinical recordings indicating the presence of any of the viral infections included in this surveillance and control programme (1, 3, 4).

The Norwegian swine industry has structurally changed during the last ten years with a decline in number of herds, but an increase in herd size. The produced tonnage of pork meat has been relatively stable. The fraction of sampled farms has been relatively stable since the start of the programme, the figures being 14.3 % and 18.2 % in 1994 and 2008, respectively. The geographical distribution of investigated farms is in accordance with the spatial distribution of the total swine herd population.

Farmed wild boars and pigs kept as pets are not included in the programme. There is no wild boar population registered in Norway.

The EU has not approved the programmes for virus infections other than AD for granting of additional guarantees, so they are continuously based on national decisions.

In conclusion, the surveillance and control programme for specific virus infections provides solid documentation of the favourable health situation in the Norwegian swine population.

References

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The National Veterinary Institute has its main laboratory in Oslo, with regional laboratories in Sandnes, Bergen, Trondheim, Harstad og Tromsø, with about 360 employees in total.

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The Norwegian Food Safety Authority (NFSA) is a governmental body whose aim is to ensure through regulations and controls that food and drinking water are as safe and healthy as possible for consumers and to promote plant, fish and animal health and ethical farming of fish and animals. We encourage environmentally friendly production and we also regulate and control cosmetics, veterinary medicines and animal health personnel. The NFSA drafts and provides information on legislation, performs risk-based inspections, monitors food safety, plant, fish and animal health, draws up contingency plans and provides updates on developments in our field of competence.

The NFSA comprises three administrative levels, and has some 1300 employees.

The NFSA advises and reports to the Ministry of Agriculture and Food, the Ministry of Fisheries and Coastal Affairs and the Ministry of Health and Care Services.

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