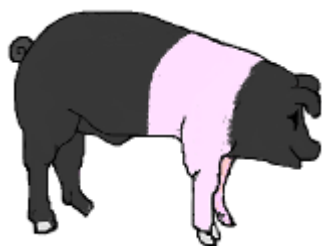


GB surveillance

Pig diseases

Quarterly Report: Vol Q1 2009

Date: 13th May 2009



The VIDA diagnoses are recorded on the VLA FarmFile database and comply with agreed diagnostic criteria against which regular validations and audits are undertaken.

The investigational expertise and comprehensive diagnostic laboratory facilities of both VLA and SAC are widely acknowledged, and unusual disease problems tend to be referred to either. However recognised conditions where there is either no diagnostic test, or a clinical diagnosis offers sufficient specificity to negate the need for laboratory investigation, are unlikely to be represented. The report may therefore be biased in favour of unusual incidents or those diseases that require laboratory investigation for confirmation.

VLA RLs have UKAS Accreditation and comply with ISO 17025 standard. SAC Veterinary Services have UKAS accreditation at their central diagnostic laboratory and at the Edinburgh and St Boswells Disease Surveillance Centres which comply with ISO 17025 standard.

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Highlights

There have been no outbreaks of Notifiable Disease or zoonoses associated with pigs.

There were no food safety incidents involving pigs in England, Wales or Scotland.

No cases involving the novel H1N1 strain of influenza causing disease in humans have been detected in GB pigs.

Swine dysentery continues to cause concern particularly in East Anglia but very encouraging to see that the industry led Producers Charter is being used to tackle the problem.

The incidence of pneumonia has declined despite Q1 being a cold quarter where more disease would be expected.

Encouraging that mannose reduced the salmonella meat juice ELISA scores significantly within 6 months – methods for tackling salmonellosis are needed.

1) INTRODUCTION

This is the fourth pig surveillance report that combines information from all areas of Great Britain into a single, integrated overview of pig health across the whole region. It has been made possible through a partnership between Defra, SEERAD, the Veterinary Laboratories Agency (VLA) and Scottish Agricultural Colleges Veterinary Services (SAC VS) Division.

A key objective for any pig disease scanning surveillance system is to increase the likelihood of early detection of important changes in pig health. Any major disease occurrence, such as the FMD outbreak of 2001, can have a major impact either by threatening public health and/or animal welfare, or through its economic impact on the agricultural industry and ancillary related industries like tourism across the whole of GB. The possibility of the incursion of exotic diseases, the emergence of a new disease, or changes in known diseases are all risks which scanning surveillance seeks to mitigate. Until now, the surveillance networks north and south of the Scottish border have reported their findings separately, which reduced the likelihood of early detection of important changes in health in this single epidemiological population. The newly unified GB-wide data resource, coupled with new collaborative analytical processes should make detection of all these scenarios both easier and quicker.

The network of 14 VLA Regional Laboratories (RLs) and two Surveillance Centres (at Veterinary Schools) in England and Wales and 8 SAC VS Disease Surveillance Centres in Scotland provides a diagnostic service to private veterinary practitioners across GB. Clinical scanning surveillance information derived from diagnostic samples and carcasses is collected and analysed to determine baseline disease levels in the pig population. The aim is to provide an assessment of the current disease status of the GB pig population and to warn of potential risks from changing disease trends or new diseases and of zoonotic diseases of human health significance.

Since 1975, diagnostic data from both the VLA and SAC has been merged in the veterinary investigation diagnosis analysis (VIDA) database. This database has been an invaluable source of epidemiological trends for over 30 years, but was limited in the range of data recorded and the analyses available. In 1998, the VLA started to produce a more detailed dataset within FarmFile - a powerful database, linked to the VIDA database, containing a greater amount of descriptive epidemiological data on all submissions and incorporating analysis tools used for disease surveillance purposes. These tools provide automated statistical analysis and built-in "alerters" which highlight statistically significant, and therefore potentially clinically significant, changes in diseases diagnosis and trends enabling more extensive analysis of data for England and Wales from 1999 onwards.

The harmonisation project was initiated in 2006 to allow the extension of FarmFile analysis to cover Scotland as well. This involved the development of a single, standardised data collection system; consistent diagnostic criteria and harmonised recording, which enables the collation of the disease surveillance data from all three countries. This has been achieved by collaboration between staff and disease consultants at the VLA and SAC VS, funded by Defra and SEERAD.

Detailed surveillance data from laboratory submissions for all three countries can now be collated, providing a far greater amount of data for analysis and interpretation by disease consultants at a GB level, resulting in improved disease understanding and efficient use of relevant expertise. This should enable action to be taken and resources to be appropriately targeted at an earlier stage than was previously possible, as the dataset is now much more extensive and drawn from the whole pig population of GB. Further analyses will be developed and refined to improve disease surveillance and the health and welfare of the pig population of GB.

2) OVERVIEW

2.1) The outlook for pig production during 2009:

A further small fall in the breeding herd is expected during 2009 but sow productivity is expected to continue to recover as PCV2 vaccination takes further effect, leading to continued reductions in porcine circo virus associated disease. It is expected that there will be some further rises in average carcass weights. The pig industry expects that in 2009, slaughterings will be lower (-4.3%) and production (-3.7%) less. The good news is that income may recover on UK pig farms from £6,300 in 2007/08 to £71,300 per farm in 2008/09.

2.1.2) Pig prices:

On the 24th January 2009 the finished pig price was 19% higher than one year previously (131.38p/kg dead weight). This probably means a profit of £2 per finished pig as the feed prices have reduced over the year. This may not continue as feed prices are now rising again with the fall in the value of the pound. Over the year 7.22million pigs were slaughtered which was the same as 2007. However, sow and boar cullings in December were more than a third less than in December 2007 but the overall total for 2008 was up by 12% to 231,000 head.

By March the deadweight average pig price had continued to rise to 140p/kg, which in real terms is about 20p/kg above the EU average. In the week ending March 20th it had risen even further to 142.8p/kg with a small fall in the carcass weight to 77.54kg. This is the second highest EU price behind that of Portugal. In February the sow price levelled and was down at 114p/kg but by the week ending March 20th had risen again to 118p/kg. In the week ended 28/2/09 the weaner price continued its upward trajectory and increased by £1 on the week to reach £49/head and by 20th March had reached £51.41 a head. During February there were 669,000 slaughterings which was 9% lower than in February 2008 but the fall within Scotland was over 16%.

Over Europe as a whole producers received 13% more in 2008 than in 2007 but it varied country to country. The UK was first in 2007 and is now 6th in 2008 with the Czech Republic receiving the greatest amount. Denmark continues to be last of the 13 studied.

2.1.3) European Union pig numbers:

Poland has seen a 19% fall in the breeding herd and is now at a 40 year low, Hungary is down by 11%, Holland 3%, and Denmark by 2.5%. The total Danish pig numbers in January 2009 are 7% down on the numbers for January 2008 with maiden gilts down over 11%. The numbers in England and Wales fell by 1.6% from December 2007 to December 2008. The Scottish December 2008 census suggested a fall of 14% during the previous 12 months.

2.1.4) Sales

During March the volume of fresh pork retailed increased by 4% compared with last year. Total expenditure during the same period was up by 13% and therefore pork prices went up by nearly 10%. The price of belly pork increased by 25% but consumption only fell by 4%. Shoulder prices increased by 15% and expenditure increased by 5.5% resulting in a 6% fall in consumption. The leg joint price consequently dropped by 5%, which resulted in an increase in consumption. This could be attributable to increased public awareness of pig products. Over 100,000 extra joints of pork were sold (15.8% more) in the week following a broadcast on pig welfare, production and good value pork products and this equates to 500 tonnes.

The Co-operative supermarket is now selling 100% British pork, gammon and bacon. Its pre-packed hams (excluding continental varieties) will all be British by the end of March 2009.

The Red Tractor logo becomes the quality mark to replace the Quality Standard Mark across the whole of the AHDB.

BPEX will soon be able to 'fingerprint' British pork to see if it is genuinely British. The trend of people eating less pork but paying more for it is likely to continue.

2.1.5) Pork Exports:

During 2008 pork exports showed a dramatic rise by 20,000 tonnes to reach 118,000 tonnes. Bacon also rose from 12,000 tonnes to more than 33,000 tonnes. Offal increased to 19,000 tonnes (18% rise) with 40% to the Netherlands and 30% to Hong Kong. In total, these exports represented £160million to the UK industry.

2.1.6) Imports:

Imports of pork in 2008 totalled around 392,000 tons down 15% compared with 2007. There was a fall in imports from the rest of the EU due to reduced supplies and a fall in the value of the pound, making imports less attractive. The supplies from Denmark, Netherlands and Germany were down for the same reasons but the overall value of the imports was similar at £692 when comparing 2007 with 2008.

The situation is changing as the lower end of the market (much more price sensitive) says it can import at least 15p/kg cheaper than using UK pork.

2.1.7) Labelling:

Labelling is not good enough but the BPEX/RSPCA effort to agree the terms Free range, Outdoor bred, Outdoor reared, Outdoor finished will help the customer choose in future.

It is essential that the industry ensure that there is a way of labelling pork that has been raised in high welfare conditions to ensure the public are aware that they can buy a high welfare product.

2.1.8) Pollution:

MEPs want to extend the integrated pollution prevention and control initiatives to more pig units.

2.1.9) BPEX:

BPEX moves to Stoneleigh in July.

NEWS ITEMS:

2.1.10) Swine Dysentery:

Having coped with problems associated with PCV2 there are now difficulties with swine dysentery in the UK. This organism can survive for 60 days in manure and carrier pigs can shed the organism for up to 90 days with resistant strains appearing. There are serious financial penalties associated with herds becoming infected, as it can cost Euro 6.50-12.90 per finishing pig and as much as Euro 4.5-6.5 per pig to control. Some straw-based finishing units have closed because of the problem.

The main reason for the increase in infected herds is thought to be the switch to two-site production with trucking of weaners in the afternoons in lorries previously used to transport finishing pigs to abattoirs in the mornings without adequate cleaning, disinfection and drying in between.

Once a farm is infected then control requires: -a) cleaning up (in the widest sense of the world) with rodent and fly control programmes. b) a medication programme for control. c) a proper period of observation to see if the disease has been eliminated.

2.1.11) Salmonella - Recent research published on Salmonella:

Salmonellae attach to the gut epithelium via type 1 fimbriae, which have an affinity with mannose, a sugar found in the epithelium. Control of salmonella requires an integrated approach combining specific nutritional technology, improved hygiene biosecurity and management practices. Only a few nutritional substances have been shown to have any effect: short-chain fatty acids-formic, propionic, butyric. Recently, a PhD from Germany has shown the valuable use of potassium dichromate together with coarse grinding of food in reducing salmonella contamination of carcasses. Bacteria adhere to the surface of cells through lectins and this can be blocked. One of the ways is to include mannose in the diets so that the salmonellae bind to the mannose in the gut lumen and not the gut wall and are therefore flushed out of the system. In an on- farm trial in the UK (Zoonoses Action Plan) using 1kg/tonne of mannanomoligosaccharides it reduced meat juice ELISA scores from 28% positive to less than 5% over a 6 month period (Alltech, 2009 Pig Progress, 25, (2) 6-8). The European Food Standards Agency report into salmonella across the EU suggests that the infected pig is twice as likely to give an infected carcass after slaughter. However, an infected carcass can also originate from contact from an infected pig. The chances of this happening also vary considerably from slaughterhouse to slaughterhouse.

2.1.12) Savings on food costs:

There are several things that can be tried by producers when trying to reduce feed costs. Reduce the amount of highly expensive phase 1 diets fed, compatible with effective growth and good welfare. Reduce the amount of wastage: -ensure that hoppers do not overflow, as feed in manure is a waste. Do not overfeed gestating sows but keep them on about 2.5-3.0kg of feed daily to give a body score of 3. Keep the food fresh for lactating sows and not stale, faecally contaminated or fermenting. In other words tailor provision and demand to sows condition and if necessary feed smaller amounts more often as the appetite post-farrowing increases. (Pigs; Action for Productivity, Efficient Feed Usage 2008, BPEX knowledge transfer www.bpex.org.uk)

2.1.13) Creep feeding

The influence of energy studies pioneered by Farmex in conjunction with BPEX has shown the value of controlling heat loss from the creep area. This has the benefit of not wasting heat into the sow area and therefore they are cooler and consume more food and therefore milk better. Heat pads rather than creep lamps will save significant amounts of money for producers on heating bills, as they heat the pigs directly and not the air around them. (Bird, N & Crabtree, H.C. 2009 The Pig Journal, 62, 61-66)

2.1.14) Pig Meat Supply Chain Task Force:

The Farming Minister, Jane Kennedy, announced the formation of the Task Force in February this year. The Task Force is chaired by the Minister and comprised mostly of representatives of the pig industry. The Task Force will focus on helping the pig meat supply chain thrive in a way that is sustainable in the long term. The Task Force has identified four work streams of high priority. Sub-groups, chaired by industry representatives, have been set up to take each of these forward. The four work streams are improving food labelling, improving pig herd health, public sector procurement and environmental requirements. The outcome set for the pig health sub-group is 'To make significant progress on disease control'. Initial discussions have taken place and the sub-group will meet for the first time in mid-May.

Further information on the Task Force and the work of each sub-group can be found at: <http://www.defra.gov.uk/farm/livestock/pigs/task-force/index.htm>

2.2) PIG DEMOGRAPHICS AND DIAGNOSTIC SUBMISSION RATES:

Demographics, submissions and carcasses:

Table 1 Pig Diagnostic Submissions and Carcasses 2005-2009, Q1 only**Table 2 Pig Diagnostic Submissions and Carcasses 2005–2009 for England, Scotland and Wales**

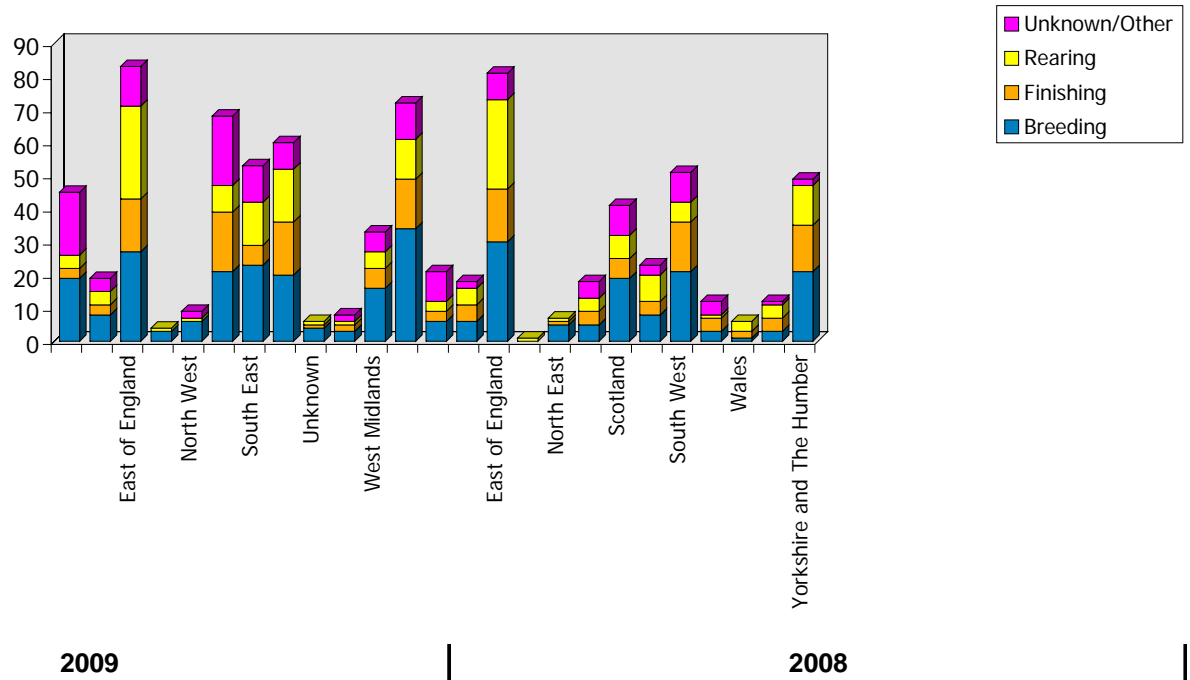
Jan-Mar	Submissions			Carcasses		
	E&W	Scotland	Total	E&W	Scotland	Total
2005	273	103	376	248	70	318
2006	359	186	545	306	95	401
2007	318	90	408	284	55	339
2008	270	70	340	305	51	356
2009	323	137	460	316	82	398

All Years	Breeding	Finishing	Rearing	Unknown/Other	X-NA	Sum:
	28	7	11	126		172
East Midlands	39	30	22	12		103
East of England	126	84	130	70		410
London	3		1			4
North East	17	4	5	1		27
North West	30	17	19	15		81
Scotland	51	30	22	238		341
South East	60	36	37	25		158
South West	108	92	65	34		299
Unknown	28	11	9	13	1	62
Wales	23	15	8	6		52
West Midlands	46	27	15	14		102
Yorkshire and The Humber	131	78	68	41		318
Sum:	690	431	412	595	1	2,129

Carcase submissions are the highest in quarter 1 since 2006 and reflect the improved financial situation currently being experienced by the industry. The histogram in Figure 1 shows that the main areas of pig production continue to provide the vast majority of diagnostic samples submitted to the VLA and SAC.

Figure 1

GB Diagnostic Submissions, Jan-Mar 2009 (Left) 2008 (Right)



2.3) THE METEOROLOGICAL OFFICE REPORT:

Temperatures were about 1°C below the monthly average (for 1971-2000) in England and Wales in January but slightly higher than the average in Scotland. In February, temperatures were average for England and Wales but slightly higher in Scotland, while in March temperatures were almost 1°C above average in all of GB.

It was a very dry quarter in most of GB: rainfall was close to the monthly average in January but well below it in February and March, especially in Wales which received about 30% of its average rainfall in February. In March, the rainfall pattern was different in Scotland, where close to average rain fell, compared to about only 60% of average in February.

2.4) NOTIFIABLE DISEASE REPORTED:

There were no suspected Notifiable Diseases reported to Animal Health involving pigs this quarter.

2.5) FARM INVESTIGATIONAL AND ADVISORY VISITS:

Currently, farm investigatory visits by VLA Veterinary Investigatory Officers are recorded for England and Wales. For Scotland, SAC record investigations, which may or may not include a visit to a farm. Harmonisation of this information is being considered for future reports. The information below is for England and Wales only.

**Table 3:
Farm Investigation and Advisory Visits**

January to March Quarter 1	Breeder	Breeder Fattener	Breeder Rearer	Breeder/ Rearer/ Fattener	Fattener	Other	Rearer	Rearer Fattener	Total Visits
2005	2	0	0	5	7	0	1	4	19
2006	1	0	3	4	3	1	0	1	13
2007	1	0	1	10	21	10	0	5	48
2008	0	1	1	6	1	1	0	2	12
2009	0	0	2	9	0	0	0	0	11
Total	4	1	7	34	32	12	1	12	103

2.6) FOOD SAFETY INCIDENTS:

There were no food safety incidents involving pigs in England, Scotland or Wales.

3) ENDEMIC DISEASE SURVEILLANCE

A note about the disease trends charts.

This section of the report gives information on the data collected and analysed for diseases that were especially prevalent during the quarter due to seasonal influences or are especially topical or noteworthy for the period covered. For this report, data for England and Wales and Scotland have been combined onto a single histogram. Our charts show the number of diagnoses (numerator) as a proportion of the number of submissions in which that diagnosis was possible (denominator). These proportions are represented as blocks and the GB, combined, proportion as a line. The blocks are accompanied by bars indicating 95% confidence limits – generally, the greater the number of samples examined, the smaller is this range and the greater the confidence that reported figure is true. Note that the y-axis scale of the charts varies and therefore care must be taken when comparing individual charts.

3.1) SALMONELLA AND SALMONELLOSIS:

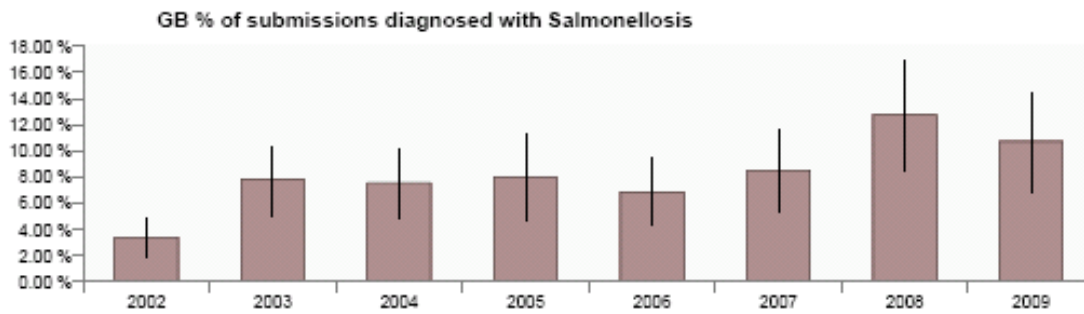
Details of the rate of diagnosis of salmonellosis from diagnosable submissions from GB are detailed below, in table 4 and figure 2 with no significant change in the percentage of submissions diagnosed with salmonellosis in 2009 compared with 2008.

**Table 4
Current Quarter 1 GB Rates Of Diagnosis For Salmonellosis In Pigs**

Year	Subs & Subs Tested			% Subs Rec'd Tested	% Subs Tested Diag'd	Confidence Interval	
	Num Subs Rec'd	Num Subs Tested	Num Subs Diag'd				
2002	679	591	20	87.04 %	3.38 %	1.91 %	4.79 %
2003	536	384	30	71.64 %	7.81 %	5.06 %	10.36 %
2004	467	371	28	79.44 %	7.55 %	4.81 %	10.13 %
2005	375	264	21	70.40 %	7.95 %	4.69 %	11.22 %
2006	534	364	25	68.16 %	6.87 %	4.27 %	9.47 %
2007	403	305	26	75.68 %	8.52 %	5.39 %	11.66 %
2008	326	236	30	72.39 %	12.71 %	8.46 %	16.96 %
2009 *	365	252	27	69.04 %	10.71 %	6.84 %	14.42 %

* period currently in progress

Figure 2



The serotypes of porcine salmonellosis incidents for VLA and SAC in Q1 are shown in table 5. *Salmonella* Typhimurium continues to be the predominant serotype in both England/Wales and Scotland and was recovered from 25 of the 27 diagnosed submissions in England and Wales.

Table 5 Serotypes in porcine salmonellosis incidents, Q1 2009

	VLA	SAC	GB total
Typhimurium	22	3	
4,5,12:l	1		
Group C		1	
Total (submissions including a carcass)	23 (13)	4	27

The 4 diagnosed cases in Scotland were from a total of 48 submissions tested (8.3%), with the 23 diagnoses from England and Wales from 204 submissions tested (11.2%). The other *Salmonella* serotype identified was 4,5,12:l, with a Group C *Salmonella* isolate of unknown serotype also identified.

Phage typing of the 25 *Salmonella* Typhimurium isolates showed that 11 of the 25 isolates were phage types U288. No further information is currently available for the other isolates.

A total of five *Salmonella* related visits were made by VIO's during Q1, with on one occasion *Salmonella* Typhimurium phage types U288 and 193 isolated from both clinically affected weaner pigs and a free range flock of 330 laying hens on the same unit. A heavy rat infestation was present on the unit and a farm gate sales operation was starting, so appropriate zoonoses, management and rodent control advice was given.

VLA Bury St. Edmunds reported a number of outbreaks of salmonellosis in this quarter. In one case diarrhoea affected approximately 200 nine-week-old pigs with 15 deaths occurring over a 3 day period. The pigs were in groups of 100 in outdoor tents on a 1,000-sow-grower-producer unit. Post mortem examination revealed watery bright green scour and mild to moderate typhlocolitis with some diphtheresis in the pigs examined. *Salmonella* Typhimurium phage type 193 was isolated. In another incident, wasting, dehydration and deaths with some diarrhoea was occurring in seven-week-old pigs on an indoor nursery-finisher unit. Approximately 20% of over 800 pigs from one source were affected with 41 deaths over days. A poor response to antimicrobial treatment was described. There was evidence of diphtheresis of the terminal ileum and caecum and proximal colon with accumulations of fibrinous material in the lumen and a thickened large intestinal wall. *Salmonella* Typhimurium U288 was isolated. In a third investigation by Bury 40 of 230 five-week-old pigs were affected with diarrhoea and wasting with 30 deaths. On-farm post mortem examination showed a diphtheritic colitis and *Salmonella* Typhimurium U288 was isolated. Despite efforts to improve cleaning and disinfection between batches, subsequent weaned pigs suffered a similar disease and further advice was given on improving the efficacy of disinfection and preventing recontamination.

Salmonella Typhimurium U288 was also isolated from six 14-week-old pigs which were submitted to VLA Sutton Bonnington for post mortem examination. Four of the six had come from one breeder unit. Clinical signs including lethargy, lameness, swollen joints and poor weight gain. All six pigs showed evidence of a severe necrotising and ulcerative colitis together with diphtheresis. Interestingly *Brachyspira pilosicoli* was isolated, and changes associated with porcine circovirus type 2 were seen in two of the pigs which had exhibited wasting, indicating the presence of concurrent PMWS.

3.1.1) FZ2015 – ZNCP for *Salmonella* in Pigs. Update for Quarterly *Salmonella* Report covering Jan – March 2009:

Since April 2008 BPEX has replaced the ZAP scheme with the Zoonoses National Control Programme for *Salmonella* in pigs (ZNCPIg). Under the scheme BPEX now send a new style report on meat juice (MJ) scores to all finishing units with the focus on reducing their rolling annual *Salmonella* prevalence and aiming for an on-farm prevalence of below 10%. VLA is able to support up to 6 free advisory ('support') visits per quarter to provide information that can be used by the farmer and his or her PVS to formulate an action plan, and to collect a set of comparable data which may be subjected to epidemiological analysis at a later date. Requests for ZNCP support visits are initiated by BPEX nominating finishing farms with appropriate high MJ Elisa results. Producers willing to host a visit then contact CERA directly using reply-paid visit request cards issued by BPEX.

Following the issue of cards to 60 farms in the first week of February, 6 farms requested Support visits from the VLA. Three of these visits had been completed by the end of April, with the others expected to be done by the end of May. This is a considerable improvement on the single ZNCP visit request received in the period April – December 2008.

In addition, since December 2007, BPEX is supporting up to 40 farms that elect to undertake interventions, such as feed and water acidification, and vaccination, to control *Salmonella*. These 'demonstration farms' are not obliged to involve VLA in any respect, however VLA will consider requests to test samples provided by the pig farm's own PVS free of charge. Submissions typically include 30 faeces samples taken on the first visit with 10 samples at each of three further visits.

As of the 22nd April most trials had concluded with only four still in progress. VLA are due to discuss with BPEX the merits of a full analysis of the impact of different interventions on faecal *Salmonella* prevalence once all data is available.

3.2) Brucellosis:

Ten samples were received at the Regional Laboratories for primary isolation of *Brucella suis* but no suspicious organisms were isolated. Routine testing of 36 boars in isolation, pre-entry into an artificial insemination centre, disclosed three animals were not negative. The farm of origin and premises were investigated but no clinical signs were seen. The three boars were retested and one still remained non-negative, the owner then decided to euthanase all three. The DVM decided that no further action was required.

3.3) Table 6: *Streptococcus suis* isolates in the first quarter of 2009 compared with the same quarters 2006 to 2008:

Type	1	2	3	4	7	8	9	10	12	14	15	16	25	31	33	1/2	UT	Totals
2006	2	18	3	3	1					1						2		30
2007	3	16	7	1							1			1		2	4	35
2008	3	16	2		3	2	1					2				1	6	36
2009	3	16	1	1	1	1	2					1			1		5	32

Streptococcus suis results are similar to the same quarter in previous years. *Streptococcus suis* 2 still being the predominant type. The figures do not suggest that any other serotype is on the increase.

No streptococci have been received from SAC for examination following a report that the incidence of untyables had increased in Scotland.

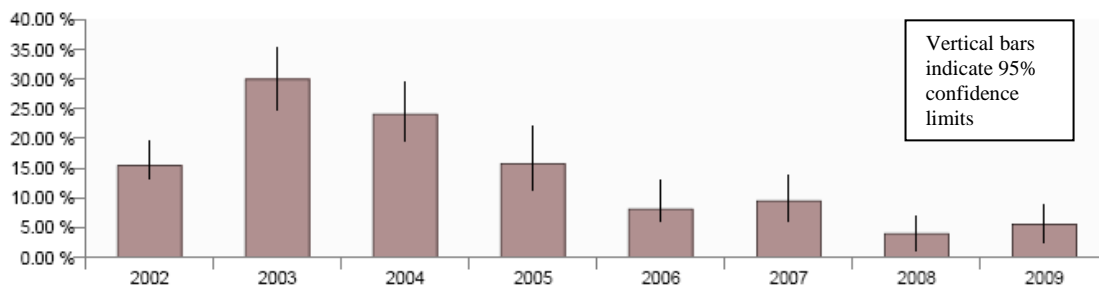
The Haemophilus strain under investigation in the previous quarter has been identified as Haemophilus parasuis by 16S typing.

No other bacteria isolated from pigs and of note were referred to Bury St Edmunds (Bury St Edmunds is the determinative bacteriology Regional Laboratory for England and Wales).

3.4) Porcine circovirus associated disease and porcine dermatitis and nephropathy syndrome (PDNS):

3.4.1) PMWS:

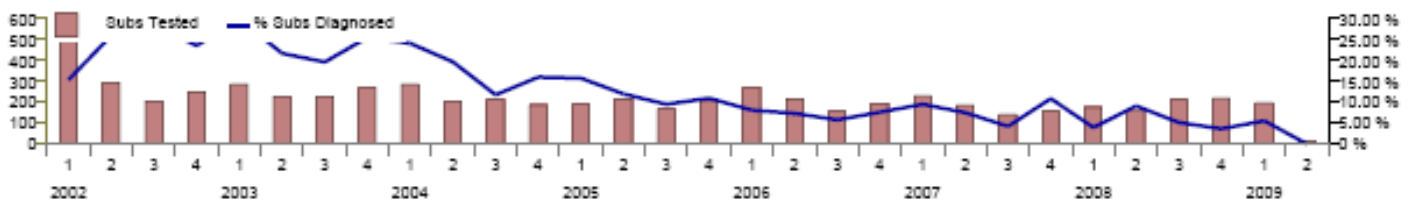
Figure 3: Diagnostic rates for PMWS for first quarters of each year 2002 - 2009.



There was little difference in the rate of postweaning multisystemic wasting syndrome (PMWS) diagnoses from the same quarter last year. (see Figure 3). This may reflect a desire to confirm suspected cases of PMWS in PCV2 vaccinated pigs while the efficacy of this new vaccine is tested by the industry. The overall trend in cases still appears to be downward at this stage however (see figure 4).

Figure 4: Numbers of submissions tested and percentages diagnosed with PMWS for all quarters since 2002.

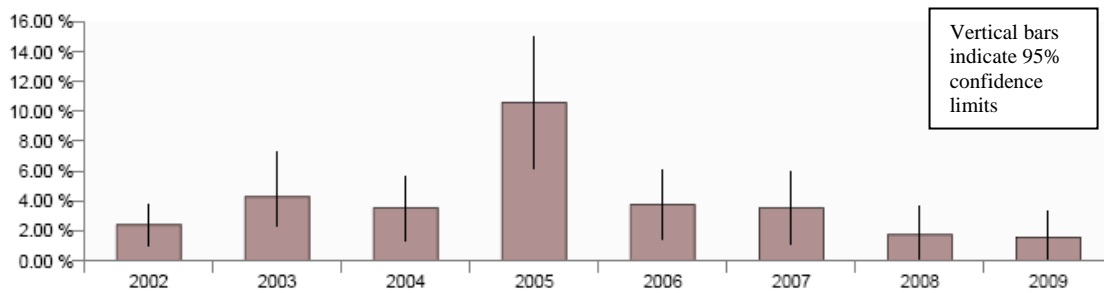
Note figures exclude continuation diagnoses and those classified as ‘diagnosis not applicable’.



3.4.2) PDNS:

Cases of PDNS remained low this quarter, (see figure 5) down from a mini peak in quarter 3 of last year. The continued use of the PCV2 vaccines and the positive reports on their efficacy are likely to be partly responsible. However, the disease can be diagnosed with some degree of certainty without recourse to a necropsy which could also affect the number of diagnoses.

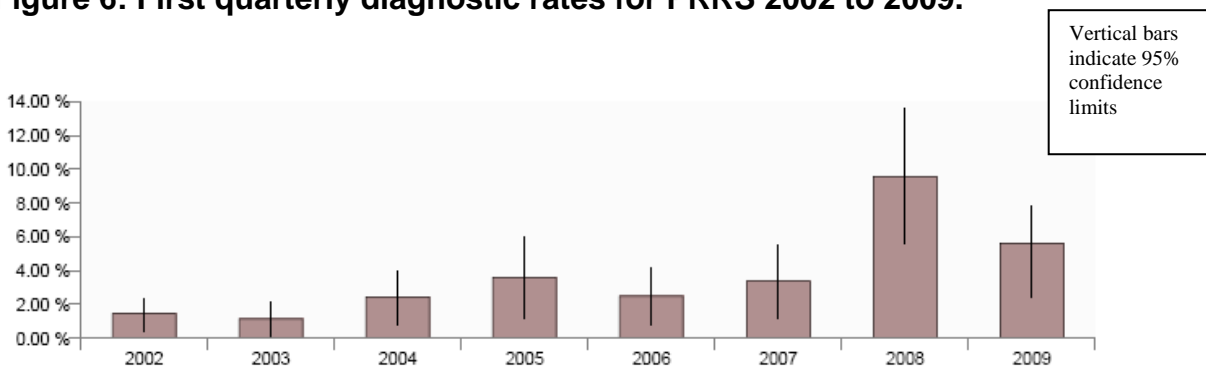
Figure 5: Percentages of diagnosable submissions confirmed with PDNS in the first quarters of each year 2002 - 2009.



3.5) PRRS:

The percentage of diagnosable submission confirmed with PRRS infection was lower when compared to the same quarter last year, (although not as low as 2007 and previous years) with similar rates recorded for the last three quarters (see figure 6).

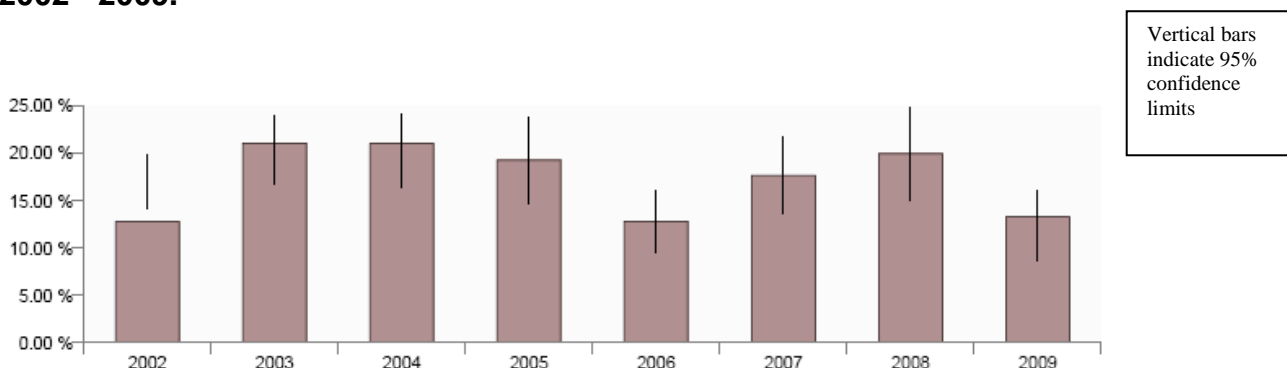
Figure 6: First quarterly diagnostic rates for PRRS 2002 to 2009.



3.6) Respiratory Disease:

Figure 7 shows that this quarter had one of the lowest diagnostic rates for pneumonias and pleurisy as a percentage of diagnosable submissions when compared with the same quarters over recent years. This is despite the inclusion of pneumonia due to PRRS and PCV2 in this category since the last quarter of 2008. The incidence of pneumonia would be expected to be highest in Q4 and Q1 as these represent the winter months when ventilation is reduced in order to conserve heat, which has an adverse effect on respiratory disease.

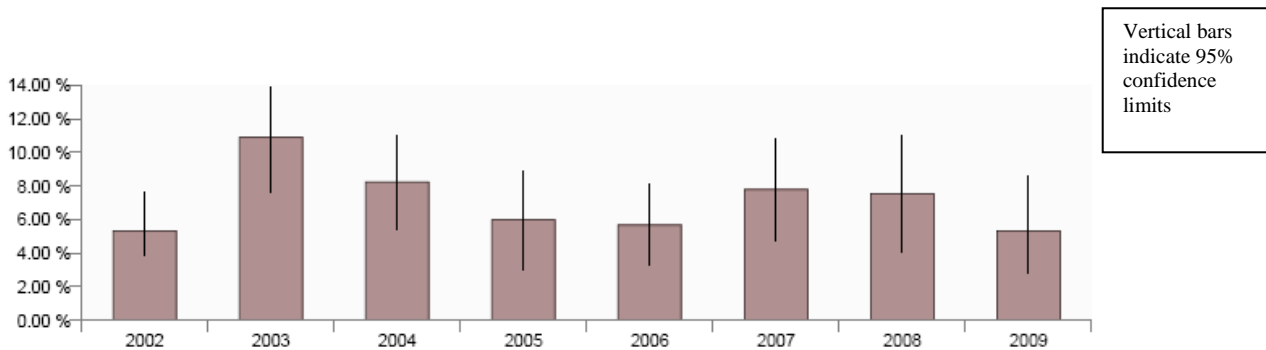
Fig. 7: Quarterly diagnostic rates for pneumonias and pleurisy comparing first quarters 2002 - 2009.



3.6.1) Pasteurellosis:

The fall in pneumonias and pleurisy is reflected in figures for pasteurellosis as might be expected and as shown in figure 8.

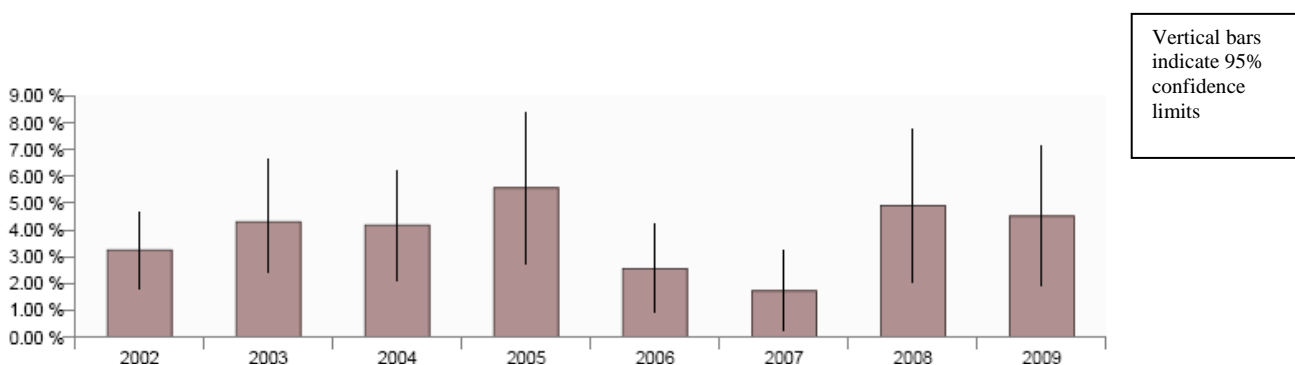
Figure 8: Percentage of submissions from quarter 1 with a diagnosis of pasteurellosis 2002 - 2009.



3.6.2) Actinobacillosis:

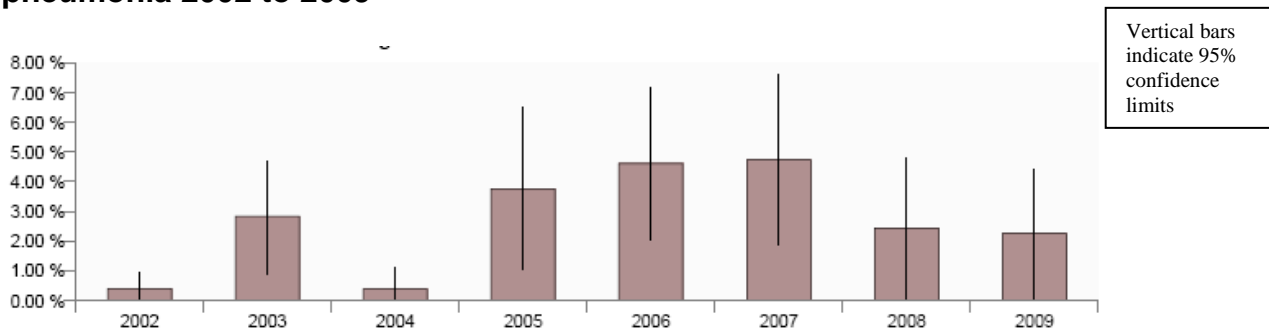
The diagnostic rates for pleuropneumonia are similar to the same quarter last year (see figure 9), although they are increased with statistical significance from the level recorded in the last quarter of last year. In one notable case finishing pigs were affected unusually late in the rearing process on a large finishing units. There were no management changes and suspicions of underlying late-onset porcine circovirus associated disease were raised when an analysis of serum from cohorts by quantitative PCR showed some individuals with greater than 10^7 viral copies (a generally accepted cut-off point above which circovirus associated disease is likely). Despite this no pathological evidence of PCV2 associated disease was detected in lung tissues or lymph-node of affected pigs which were received for post-mortem examination. The unit is a large continuous throughput enterprise which was considered understaffed for the number of pigs present (two staff for 10,500 pigs).

Figure 9: First quarter diagnostic rates for *Actinobacillus pleuropneumoniae* associated pneumonia 2002 - 2009.



3.6.3) Enzootic pneumonia:

The quarterly percentage of relevant diagnostic submissions with a diagnosis of enzootic pneumonia was unchanged from the same quarter last year and at the lower rate which is usually seen in this quarter (see Figure 10). This was down from a small peak which occurred in quarter 3 last year and which was not sustained.

Figure 10: Percentage of submissions from quarter 1 diagnosed with enzootic pneumonia 2002 to 2009

3.6.4) Swine Influenza:

Rapidly spreading coughing on a large East Anglian continuous nursery finisher unit with a total of 11,000 pigs began on New Year's Eve and prompted submission of a dead pig to investigate possible swine influenza. In the rearing shed, which was worst affected, approximately 700 of 3,500 pigs were coughing, but appeared bright, with five deaths observed in two days. Pigs had been vaccinated for *Mycoplasma hyopneumoniae* and PCV-2 at weaning. On post-mortem, the submitted pig had a severe fibrinopurulent tracheitis with a significant bronchopneumonia and unilateral fibrinous pleurisy from which *Pasteurella multocida* and *Streptococcus suis* type 2 were isolated. Swine influenza virus infection was confirmed by isolation of H1N2 influenza virus and immunohistochemistry. The practitioner considered that the outbreak was typical 'swine flu' with very rapid lateral spread within a few days around the unit to all ages of pig from 4-20 weeks old. He considered the outbreak to be relatively mild; the remaining pigs were treated with chlortetracycline in-feed and mortality was low with 35 pigs per week lost compared with an expected 25 per week.

Following the isolation of an H1N2 virus (A/swine/England/3/09) VLA have completed genetic characterisation of the eight influenza virus gene segments. This analysis showed that this influenza A virus isolate had arisen through re-assortment. The virus is a novel influenza A virus reassortant that has not been detected elsewhere previously. The haemagglutinin (HA) gene derives from a human strain of H1N2 virus (distinct from that of contemporary H1N2 swine viruses) that was circulating in the human population in approximately 2001-2003. The genes encoding all of the internal proteins are of 'avian-like' swine origin and therefore consistent with those present in the endemic strains of influenza circulating in GB pigs. The neuraminidase gene is divergent (~7%) from other known N2's but appears to derive from a common ancestor to 'human-like' swine H3N2 viruses present in GB pigs in the late 1980's/early 1990's.

The detection of this virus so far has been restricted to one case. It is interesting to note that the 'backbone' of 'avian-like' swine genes appears to confer viability on the virus, as has been seen consistently in reassorted viruses in European swine. Implications for serodiagnostics are also under investigation.

Novel reassortant influenza viruses (of H1N1, H1N2 and H3N2 subtypes) arise in swine populations in the USA sporadically and since the 1990s have been considered the predominant swine influenza strains among North American pig herds (according to Shinde and others, 2009).

Based on current evidence from surveillance programmes in several European countries including Great Britain, the novel variant of H1N1 virus recently isolated from people has not been reported in the European pig population (Irvine & Brown, 2009). It is important for vigilance

to be maintained both within the swine and human sectors for the emergence or spread of the newly reported H1N1 virus. The recent report of human-to-pig transmission in Alberta, Canada highlights the importance of reverse zoonosis, a recognised phenomenon in influenza virus epidemiology.

References:

Irvine R.M. and Brown I.H., (2009). Novel H1N1 influenza in people: global spread from an animal source? *Vet Rec* 164 (19); 577

Shinde V, Brisges CB, Uyeki TM *et al* (2009). Triple-Reassortant Swine Influenza A (H1) in Humans in the United States, 2005-2009 *NEJM* Epub: May 7

<http://content.nejm.org/cgi/content/full/NEJMoa0903812v1>

Comment:

The detection of influenza viruses in pigs that have re-assorted with human strains of influenza virus occurs periodically. One of the goals of the surveillance project is to identify such viruses and monitor their persistence in the pig population. There is no evidence to suggest that re-assorted viruses identified in pigs are more pathogenic or have increased zoonotic potential than the more typical swine influenza viruses commonly seen in pigs.

Table 7: Number of samples tested for swine influenza and the number positive by quarter and year

Year	Q1 no tested	Q1 no (%) positive	Q2 no tested	Q2 no (%) positive	Q3 no tested	Q3 no (%) positive	Q4 no tested	Q4 no positive	Total
2007	88	4 (4.5%)	33	1 (3.0%)	27	0 (0%)	53	3 (5.7%)	201/8 (4.0%)
2008	84	4 (4.8%)	64	4 (6.3%)	72	2 (2.8%)	152	3 (2.0%)	372/13 (3.5%)
2009	76	3* (3.9%)	-	-	-	-	-	-	-

All data from 2007 and 2008 quarterly reports has been reviewed as some quarterly reports referred to submissions and others to samples tested. This table contains the definitive figures for 2007Q1 to 2009 Q1

*** All positive samples in Q1 2009 were from the same submission and yielded a novel H1N2 influenza A virus (see above)**

More information on swine influenza and H1N1 influenza virus can be found on the VLA and Defra websites:

http://www.defra.gov.uk/vla/diseases/dis_si.htm

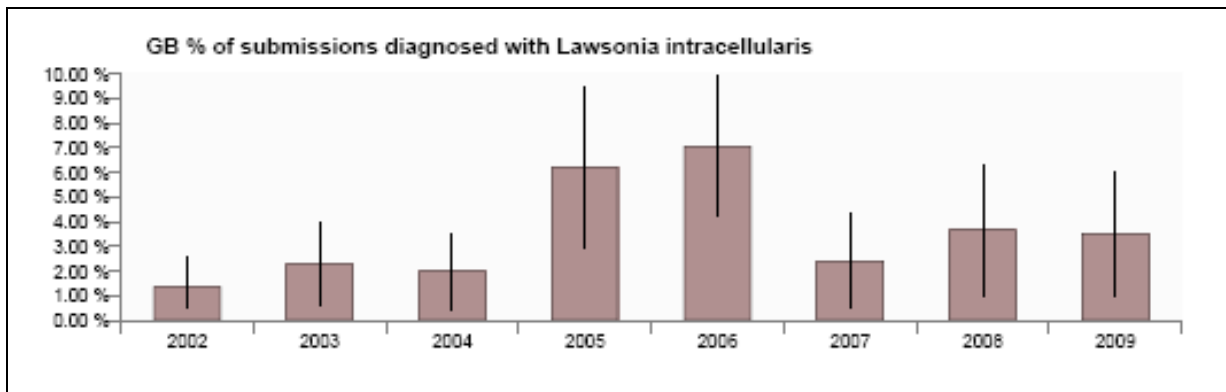
<http://www.defra.gov.uk/animalh/diseases/swine-flu/index.htm>

3.7) Alimentary Disease:

3.7.1) Porcine Proliferative Enteritis (*Lawsonia intracellularis*):

Three diagnoses of porcine proliferative enteritis were made in England and Wales in the first quarter of 2008 with four cases in Scotland. Diagnostic rates for GB during this quarter show no major trends since 2007 (see figure 11).

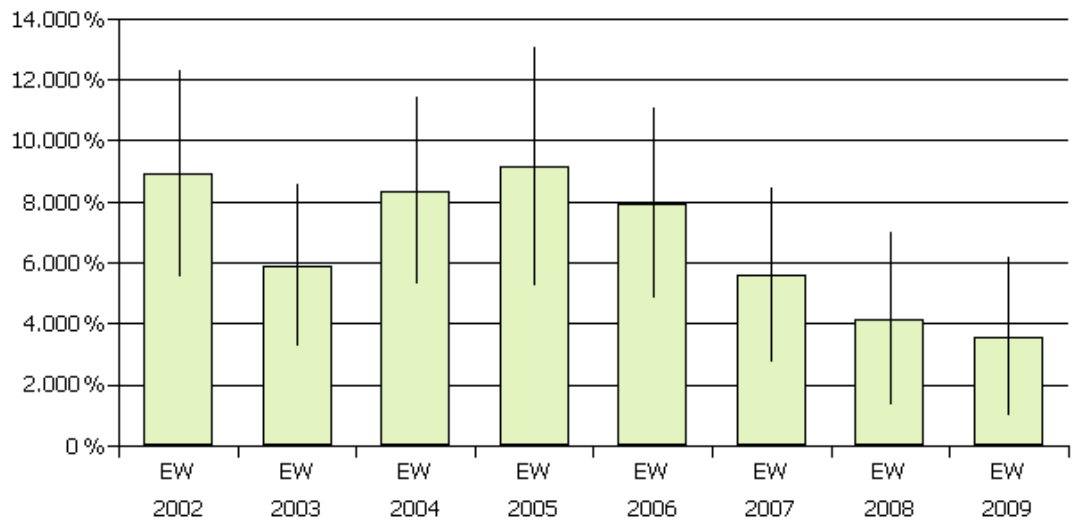
Figure 11: Diagnostic rates for *Lawsonia intracellularis* in GB pigs for the first quarter, 2002-2009.



3.7.2) Enteric colibacillosis:

Six diagnoses of enteric colibacillosis were made in England and Wales this quarter. These were predominantly K88 adhesin positive serotypes in pigs with an age range from two days to six weeks. The affected two-day-old piglet litter also had concurrent *Streptococcus suis* infection. 045:KE65 serotype was isolated from four-week-old scouring pre-weaned pigs on an organic outdoor unit, a serotype classically associated with oedema disease. The overall trends for all E. coli related diseases remains unchanged compared with the previous first quarter results since 2002. (Figure 12)

Figure 12: % Submissions diagnoses with E. coli disease (England and Wales)



In contrast no cases of enteric colibacillosis were identified in Scotland this quarter.

3.7.3) Neonatal Enteric Disease:

Rotavirus, *Clostridium perfringens* enteritis, coccidiosis.

Rotavirus was sporadically diagnosed throughout this quarter. Affected litters typically showed high morbidity. Significant mortality was seen if intensive supportive measures to combat dehydration were not employed.

Cl. perfringens continues to cause enteric disease in neonatal pigs. This was usually associated with either *Cl. perfringens* type A or C. However toxin testing in one neonatal scour outbreak detected alpha and epsilon toxins suggesting either type B or D infection.

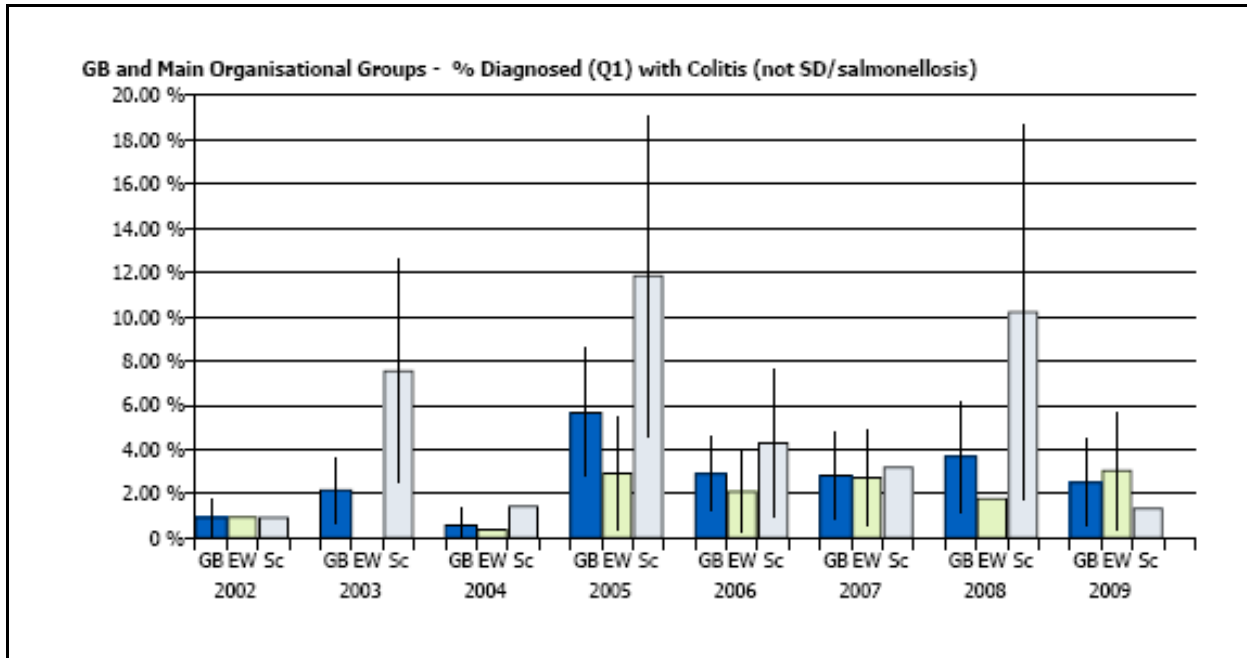
Cl. perfringens type C, with detectable alpha and beta toxin in intestinal contents, caused 25% mortality in neonatal outdoor pigs.

Coccidiosis was diagnosed only once in England and Wales.

3.7.4) Non-specific colitis:

Three diagnoses of non-specific colitis were made in England and Wales during the first quarter of 2009. Rising feed costs leading to dietary experimentation may have been a trigger factor in precipitating clinical disease. Effective control measures are difficult to implement, as aetiology is often uncertain. Non-starch polysaccharides (NSPs) especially glucose, arabinose and xylose, have been identified as risk factors in one Scottish study (Close-Topping *et al.*, Veterinary Journal, 173, 353-360).

Figure 13: Diagnostic rate for colitis other than swine dysentery and salmonellosis during Q1, 2002-2009



B. pilosicoli was diagnosed on 5 occasions this quarter as a cause of colitis. In two of these cases it was the only enteric pathogen identified. In other more complicated cases, it co-existed with *B. hyodysenteriae*, Porcine Circovirus Associated Disease (PCVAD), and Glassers disease. Wasting with or without diarrhoea were the commonest presenting signs.

3.7.5) Gastric Ulceration and Gastric Disorder:

Gastric ulceration was diagnosed six times this quarter in England and Wales. This condition is usually related to stress, pellet size and adverse feeding regimes. Two incidents reported were in pigs suffering PRRSv infection and a third case was concurrently infected with salmonella. A breeding boar was seen to be off colour for a couple of days and was euthanased on humane grounds whereupon the post mortem examination revealed his stomach and colon to be severely impacted with dry fibrous matter thought to be bedding material. This was an unusual finding.

3.7.6) Helminthiasis:

Two diagnoses of ascariasis were made this quarter, both on the basis of high faecal egg counts.

3.7.7) Intestinal Torsion and Intestinal Haemorrhage Syndrome.

Torsion of the small intestine was diagnosed as the cause of sudden death of an outdoor pig. Intestinal haemorrhage syndrome was suspected on the basis of histopathological findings on a submitted formalin-fixed section of gut. So-called 'bloody gut' has several proposed aetiologies and was traditionally more associated with whey-fed pigs than dry-fed animals. Several bacteria have been suggested as contributing to the problem including *E. coli*, *Cl. perfringens* type A and C.

3.7.8) Rectal Stricture:

An investigation was made into a rectal stricture problem in 10-50 kg growing pigs on various sites all under the ownership of one large company pyramid. This condition was estimated to account for about 1% post weaning mortality which in a 600 sow pyramid with 20 pigs sold per sow per year (12,000 pigs) was a significant adverse contribution to profitability. Careful dissection of chronically affected pigs suggested that rectal prolapse was not the initial event. Instead it was suspected that non-fatal bacteraemia had resulted in septic embolus formation in rectal vasculature which has poor collateral circulation. The pyramid is PRRSv-positive and this virus infection is known to predispose to *Streptococcus suis* bacteraemia by compromising clearance of circulating bacteria by alveolar macrophages (the target cell type for PRRSv). Although impossible to conclusively prove this pathogenetic hypothesis, it seemed reasonable to recommend that attention be focussed on controlling PRRSv infection in the pyramid.

3.8) Mycoplasmas:

3.8.1) *Mycoplasma* Surveillance:

130 samples from 56 cases were submitted to the Mycoplasma group. *M. hyopneumoniae* was identified on 11 occasions twice mixed with *M. hyorhinis*, all were from lung samples. Additionally, *M. hyorhinis* was detected 23 times from lungs and once mixed with *M. arginini* and once mixed with *M. hyosynoviae*.

VLA Truro reported that post mortem examination of a three-month-old Large Black pig revealed consolidation of approximately 75% of lung and numerous *Metastrongylus* nematodes in the distal trachea and bronchi. *Mycoplasma hyopneumoniae* was detected in lung by DGGE. Histopathology confirmed the diagnosis of metastrongylosis and concurrent enzootic pneumonia consistent with the common finding of multifactorial porcine pneumonia.

VLA Bury St Edmunds identified a severe pleuropneumonia at post mortem examination of a 14-week-old pig. *Mycoplasma hyorhinis* and *Pasteurella multocida* were detected in lung. This pig had concurrent infections with other agents; immunohistochemistry revealed active PCV-2 infection in lymph node and lung and *Brachyspira pilosicoli* was isolated from the large intestine of this pig.

VLA Thirsk received two grower/finisher pigs for post mortem examination. On gross examination, extensive crater-like gastric ulceration was confirmed in one pig. This pig also showed extensive fibrinous and fibrous pleurisy with adhesions to the thoracic wall. The lung showed 60% consolidation with a cranioventral distribution. In the second pig, there was evidence of hyperkeratosis in the stomach but no discrete ulcer. The gross changes in the lungs of the second pig were marked with cranioventral consolidation affecting 70% of lung. *Mycoplasma hyopneumoniae* was detected by DGGE and culture produced *Actinobacillus pleuropneumoniae* from the lung of the second pig; lung was also positive for PRRS virus by PCR. A diagnosis of multifactorial respiratory disease was made and it was thought likely that the lung pathology was contributing to inappetence and therefore gastric ulceration.

3.8.2) *Mycoplasma* World News:

Villareal *et al.* (2009) report that infection with a low virulent *M. hyopneumoniae* isolate does not protect piglets against subsequent infection with a more virulent isolate 4 weeks later.

Reference: Villareal *et al.* (2009). Infection with a low virulent *Mycoplasma hyopneumoniae* isolate does not protect piglets against a subsequent infection with a highly virulent *M. hyopneumoniae* isolate. *Vaccine* **27**: 1875-1879.

3.9) Reproductive Diseases:

There were 20 submissions for the diagnosis of abortion: 4 in January, 6 in February and 10 in March, demonstrating an increase over the previous quarter. Twelve submissions were received for other reproductive diseases, demonstrating a decrease over the previous quarter with 4 submissions received in each month of the quarter. A definitive diagnosis was made three times, twice for PRRS virus when viral RNA was detected by PCR in foetuses, and once for porcine parvovirus by PCR and ELISA detection of viral DNA and antigen, respectively.

Table 8: Number of pig submissions submitted for diagnosis of reproductive diseases

Year	Abortion					Other reproductive				
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
2006	27	17	21	11	76	17	14	19	34	84
2007	16	11	24	14	65	9	11	22	18	60
2008	13	20	32	16	81	15	16	17	18	66
2009	20					12				

3.10) Nervous Diseases:

No nervous diseases of note were investigated this quarter

4) UNUSUAL AND NEW DISEASES

No unusual or new diseases were reported or investigated this quarter.

5) SYNDROMIC DISEASE ANALYSIS

VLA and SAC VS record both the main clinical signs and the main body system for each diagnostic submission that is examined. This allows analysis of data for the major clinical presentations (e.g. diarrhoea, respiratory signs, found dead, wasting/poor condition) and for the main body systems (e.g. circulatory, respiratory, urinary). This data can be further examined for other major risk factors, such as type of pig, housing, organic status and age, which are recorded on the form accompanying the submission.

Swine dysentery is causing significant disease problems in parts of the country and therefore for this report it has been analysed in more detail rather than undertaking a syndromic analysis.

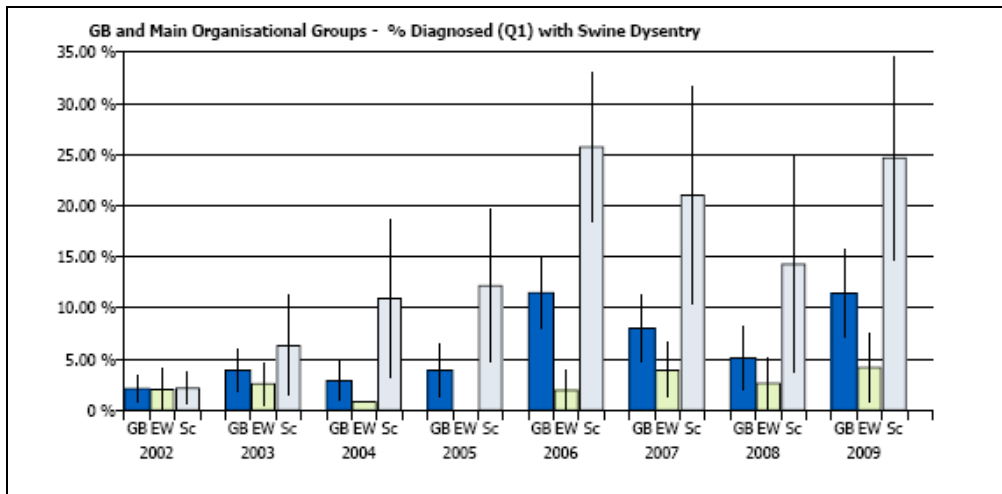
5.1) Swine Dysentery (*B. Hyodysenteriae*):

In the first quarter of 2009, 24 submissions were diagnosed with swine dysentery (SD), six in England and Wales (25%), and 18 in Scotland (75%). The diagnostic rate for SD in this quarter was 11.06% of all submissions tested double the rate (5.13%) over the same period in 2008. There was a unit in the North East that was infected with *Brachyspira hyodysenteriae* that was resistant to all antimicrobials used for the treatment of swine dysentery. The farmer was unaware of the losses that were being incurred because of the need for constant medication. Pigs only went for slaughter but the potential for infection to spread to another unit remained but when the farmer became aware of his losses he decided to cease pig production and the whole herd has been slaughtered.

Table 9: Diagnostic rates for swine dysentery for GB in the first quarter (January- March) 2002-2009.

Year	Subs & Subs Tested			% Subs Rec'd Tested	% Subs Tested Diag'd	Confidence Interval	
	Num Subs Rec'd	Num Subs Tested	Num Subs Diag'd				
2002	679	521	11	76.73 %	2.11 %	0.87 %	3.32 %
2003	535	328	12	61.31 %	3.66 %	1.82 %	5.97 %
2004	467	311	9	66.60 %	2.89 %	1.03 %	4.74 %
2005	375	231	9	61.60 %	3.90 %	1.40 %	6.39 %
2006	534	340	39	63.67 %	11.47 %	8.08 %	14.86 %
2007	402	261	20	64.93 %	7.66 %	4.73 %	11.30 %
2008	326	195	10	59.82 %	5.13 %	2.03 %	8.22 %
2009 *	354	217	24	61.30 %	11.06 %	7.24 %	15.70 %

Figure 14: Diagnostic rate of swine dysentery in GB in the first quarter of the year, 2002-2009.



Compared to the previous quarter (Q4 2008), the figures in table 9 and figure 14 represent a non-significant fall in the number of cases diagnosed in England and Wales (6 c.f. 16) and Scotland (18 c.f. 19). However, cases continue to occur and East Anglia remains a focus for producer concern (see below). The situation in Scotland may also be of concern as they proportionately saw more cases than England and Wales?

5.2) Industry responses to swine dysentery:

5.2.1) The Swine Dysentery Producers' Charter: Update:

As mentioned last quarter, following a steady increase in diagnoses of swine dysentery in East Anglia over the past four years, and reports of increased problems in the field, the Swine Dysentery Producers' Charter was established in the region. The aim is to limit further spread of dysentery and work towards regional eradication. VLA has collaborated with the British Pig Executive (BPEX), pig specialist veterinary surgeons, producers and processors in East Anglia to establish the Charter and provide biosecurity guidelines for units infected with SD. Analysis of the spread of infection surprisingly indicates that pig movements were responsible for less than half of the 'new' outbreaks. Other more likely vectors suspected or proved to be involved included birds, lorries, stockmen, knackermen, farm personnel, agricultural contractors and local spread (rodents, close contact). All these latter routes of transmission were considered to have been preventable with attention to basic biosecurity measures.

Further details are available on the BPEX website, at:
<http://www.bpex.org/SwineDysentery/Default.aspx>

So far, 42 producers have signed up to the Charter's principles and the initiative has increased knowledge of the disease, and improved collaboration between stakeholders.

5.2.2) BPEX Knowledge Transfer:

BPEX has also been proactive in transferring knowledge and useful advice to producers and stakeholders through its information leaflets. These can be accessed at:
<http://www.bpex.org.uk/publications/A4Ps.aspx>

5.2.3) Disease Reduction/ Eradication Proposal - collaboration between Yorkshire Forward Regional Development Agency and local producers/ BPEX:

The BPEX tender to Yorkshire Forward, the Yorkshire Regional Development Agency, was successful. This agency aims to effect tangible improvements in the health status of pigs in the region. All proposals enjoy joint funding from RDA and BPEX. Despite the recognized diagnostic difficulties, SD will be included in the list of diseases to be targeted, alongside PRRSv, enzootic pneumonia and mange. The plan initially outlined is in two-stages, the first of which aims to identify:

- Where the pigs are
- Their disease status.

This is a difficult and ambitious challenge but central to all proposals is a firm emphasis on farmer/ producer collaboration and involvement.

5.3) Recent publications and scientific developments relating to SD:

Possibly the most significant development in the study of *Brachyspira hyodysenteriae* for a little while has been the recent publication of the organism's entire genome by Bellgard et al (2009). The genome sequence of *B. hyodysenteriae* WA1 strain was determined, making it the first representative of the genus *Brachyspira* to be sequenced, and the seventeenth spirochaete genome to be reported. The genome consists of a 3 million base pair (bp) circular chromosome and a 35, 940 bp circular plasmid which had not previously been described. Potential virulence genes including those coding for 15 proteases and 6 haemolysins were identified. The authors remark that analysis of the genome sequences of other pathogenic and non-pathogenic *Brachyspira* species may help to pinpoint attributes of *B. hyodysenteriae* which contribute to its ability to cause disease. This work may lead to applications in vaccine and diagnostics development to better control this troublesome infection.

A reliable and validated blood test for *B. hyodysenteriae* has so far proved elusive but would certainly be a useful tool in eradication programmes. A recent paper described attempts to measure the humoral response of infected pigs to a recombinant histidine tagged lipoprotein of *B. hyodysenteriae*, using an ELISA test. This protein may or may not be unique to *B. hyodysenteriae*. Testing of 337 sera collected at slaughter from known positive farms suggested a sensitivity of 100% at the herd level although relatively few herds were tested. A major constraint cited was the practical problems associated with obtaining a reliable well-defined set of sera from pigs/ herds with confirmed health status.

Carriage of *B. hyodysenteriae* (as well as *Lawsonia intracellularis* and *B. pilosicoli*) by feral pigs was reported for the first time in Australia this year. PCR was used as the diagnostic tool and 18 (8%) of the sampled population of (222 faeces samples) were positive. There is no reason to suppose feral British pigs or wild boar are any different and this has clear biosecurity implications for UK pig farms in the vicinity of feral wild boar populations. Human carriage of *B. pilosicoli* is well reported, but its potential as a human pathogen is not established.

References:

- 1 Bellgard, M. I. Et et al. (2009) Genome sequence of the pathogenic intestinal spirochaete *Brachyspira hyodysenteriae* reveals adaptations to its lifestyle in the porcine large intestine. PloS ONE, 4(3), 1-12.
- 2 La, T., Phillips, N.D. & Hampson, D.J. (2009) Evaluation of recombinant Bhlp29.7 as an ELISA antigen for detecting pig herds with swine dysentery. Veterinary Microbiology, 133, 98-104.

- 3 Margawani, KR; Robertson, ID; Hampson, DJ. (2009). Isolation of the anaerobic intestinal spirochaete *Brachyspira pilosicoli* from long-term residents and Indonesian visitors to Perth, Western Australia. *Journal Of Medical Microbiology*, 58(2), 248-252
- 4 Phillips, N.D., La, T., Adams, P.J., Harland, B.L., Fenwick, S.G. and Hampson, D.J. (2009) Detection of *Brachyspira hyodysenteriae*, *Lawsonia intracellularis* and *Brachyspira pilosicoli* in feral pigs. *Veterinary Microbiology*, 134, 294-299.

6) SCANNING SURVEILLANCE FOR NEW AND EMERGING DISEASES IN PIGS

Monitoring the trends in diagnoses of known diseases cannot, by definition, detect either new diseases, or changes in endemic diseases that would prevent a diagnosis from being reached (for example a change in the pathogen that compromised the usual diagnostic test). Such new or emerging diseases would likely first be detected by observation of increased numbers of clinical and/or pathological syndromes for which a diagnosis could not be reached in the normal way. Such submissions are regularly analysed to look for changes that could indicate the presence of a new or emerging disease, which may be reflected by an increase in undiagnosed disease. Undiagnosed disease submissions are summarised broadly by the clinical presentation of disease and, once this has been determined by further investigation, the body system affected. Both groups are investigated and trends in the levels are compared over time.

This approach has been developed and refined over recent years and such analyses are now possible for data from GB.

The following is a summary of pig data analysed by VLA and SAC from diagnostic samples submitted to Regional Laboratories. The aim of this report is to review data where a diagnosis was not reached despite the sample receiving "reasonable" testing. This allows monitoring of this class with the aim of providing information on new or emerging syndromes. For a full account of the methodology, please consult: <http://vla51/ScanningSurveillance/Home.aspx>

It should be noted that VLA reports prior to 2005 on undiagnosed submissions included submissions which received both adequate and limited testing. Comparisons between the figures within this report should bear this in mind. 'Prior years' refers to pooled data for years 2004-2008 for VLA only data, and to data for 2008 for GB DNR analysis.

Overall DNR rates:

- The overall percentage of GB pig diagnostic submissions from VIDA for the 3 months of 2009 (to first quarter, Q1) where a diagnosis was not reached (DNR) was 17.3% (47/272). This was not significantly increased from data to Q1 for prior years in which DNR was 15.1%. VLA and SAC rates were not significantly increased with overall DNR of 18.4% and 15.1 % respectively.
- The overall DNR rate for the first quarter of 2009 was not significantly increased from the previous quarter (Q4, 2008) DNR, or from the DNR for the equivalent quarter (Q1) in 2008.
- There was no significant increase in DNR rate for any individual syndrome for Q1, 2009 compared to prior years.
- There was no significant increase in DNR in Q1, 2009 for respiratory syndrome or for submissions with respiratory disease as a presenting sign. DNR for respiratory syndrome remains low at 9.5% (4/42) and for respiratory disease as a presenting sign at 8.3% (2/24).
- There was a significant increase in GB DNR rate for submissions with a presenting sign of wasting in Q1, 2009 (21.9%, 7/32) compared to prior years (0%).
- No other presenting sign showed a significant increase in DNR for Q1, 2009.

- Tables 11 and 12 give GB, VLA and SAC DNR rates by syndrome and presenting sign to Q1, 2009 compared to prior years.
- Looking at rolling 12-month data for VLA submissions, there was no increase in DNR for any presenting sign or syndrome for Q1, 2009 compared to prior years (2004-8).
- Table 13 gives VLA 12 month rolling DNR rates by syndrome to Q1, 2009 compared to prior years.

Increased DNR for wasting as a presenting sign: GB VIDA data:

- Seven of 32 submissions with a presenting sign of wasting were not diagnosed in Q1, 2009 while all 29 submissions in Q1 of 2008 were diagnosed. These seven DNR submissions were reviewed.
- Five submissions were housed pigs (although housed pigs are over-represented and constitute 23 of the 32 submissions with wasting as main presenting sign). The husbandry for the other two DNR submissions was not known.
- Several regions were represented (Yorks/Humb, NE, SE, Wales, Scotland).
- Submissions were from post weaned and pre-weaned pigs.
- All but one were carcase submissions.
- The details of VLA undiagnosed submissions (coded as reasonable testing) with wasting as a presenting sign (both main and secondary) were reviewed. Details are given in table 10.
- Wasting is a non-specific clinical sign and no laboratory diagnosis may be achieved where wasting is the result of a managerial or environmental problem, or where the pigs are wasted due to an earlier disease or managerial insult which is no longer apparent.
- Overall, there is no evidence that the increased DNR for pigs presented with wasting is due to the emergence of a new disease or syndrome, however this will be reviewed and more details of the DNR submissions in Scotland will be obtained.

Table 10: Undiagnosed VLA submissions with wasting as a presenting sign - Q1 2009

<i>Submission</i>	<i>Age</i>	<i>History</i>	<i>Comment</i>
1	6 weeks old	Diarrhoea and wasting	Enteritis undiagnosed
2	9 weeks old	Diarrhoea and wasting	Only one faecal sample submitted, testing limited
3	13 days old	Pre-weaning diarrhoea and wasting	Likely rotavirus but chronic case, virus not detected
4	5 weeks old	Wasting	Bacterial enteritis/colitis, earlier insult suspected
5	7 and 21 days old	Low birth weights, splayleg and increased pre-weaning mortality	Hepatositis dietetica-like lesions, problem on farm resolved
6	24 weeks	Whole of one litter wasting	Fibrous polyserositis, too chronic for diagnosis

Table 11: VIDA Overall Changes in DNR rates for Pigs by Presenting Sign to Q1 for 2009 and prior years (2008)

Presenting Sign	Overall			Prior years (from 2008)			2009			diff	SE Yr-Yr	z
	DNR	Subs	% DNR	DNR	Subs	% DNR	DNR	Subs	% DNR			
ABORTION	12	19	63.16 %	3	6	50.00 %	9	13	69.23 %	19.23 %		
DIARRHOEA	23	90	25.56 %	10	41	24.39 %	13	49	26.53 %	2.14 %	9.23 %	0.23
FNDDOED	6	100	6.00 %	5	52	9.62 %	1	48	2.08 %	-7.53 %	4.75 %	-1.58
GIT_XDIARR	2	5	40.00 %	2	5	40.00 %	0	0		-40.00 %		
HEALTHY	0	1	0.00 %	0	0		0	1	0.00 %	0.00 %		
LAME	1	20	5.00 %	1	10	10.00 %	0	10	0.00 %	-10.00 %		
MALAISE	6	28	21.43 %	2	12	16.67 %	4	16	25.00 %	8.33 %		
MUSC_SKEL	0	1	0.00 %	0	1	0.00 %	0	0		0.00 %		
NERVOUS	2	16	12.50 %	2	9	22.22 %	0	7	0.00 %	-22.22 %		
OTHER	3	42	7.14 %	1	15	6.67 %	2	27	7.41 %	0.74 %	8.29 %	0.09
RECUMBT	2	10	20.00 %	1	6	16.67 %	1	4	25.00 %	8.33 %		
REPRO	6	10	60.00 %	4	6	66.67 %	2	4	50.00 %	-16.67 %		
RESPIR	5	51	9.80 %	3	27	11.11 %	2	24	8.33 %	-2.78 %	8.34 %	-0.33
SKIN	2	12	16.67 %	2	7	28.57 %	0	5	0.00 %	-28.57 %		
UNKNOWN	7	50	14.00 %	1	19	5.26 %	6	31	19.35 %	14.09 %	10.11 %	1.39
URINARY	0	1	0.00 %	0	0		0	1	0.00 %	0.00 %		
WASTING	7	61	11.48 %	0	29	0.00 %	7	32	21.88 %	21.88 %	8.17 %	2.68
	84	617	16.26 %	37	246	16.10 %	47	272	17.8 %	2.18 %	3.25 %	0.67

SAC	Pres	Overall			Prior years			2009			diff	SE Yr-Yr	z
		DNR	Subs	% DNR	DNR	Subs	% DNR	DNR	Subs	% DNR			
ABORTION	2	3	66.7 %	0	0		2	3	66.7 %	66.7 %			
DIARRHOEA	3	17	17.6 %	1	4	25.00 %	2	13	15.4 %	-9.6 %			
FNDDOED	3	27	11.1 %	2	12	16.67 %	1	15	6.7 %	-10.0 %			
LAME	0	2	0.0 %	0	2	0.00 %	0	0		0.0 %			
NERVOUS	0	3	0.0 %	0	0		0	3	0.0 %	0.0 %			
OTHER	1	34	2.9 %	1	14	7.14 %	0	20	0.0 %	-7.1 %			
REPRO	1	2	50.0 %	1	1	100.00 %	0	1	0.0 %	-100.0 %			
RESPIR	2	6	33.3 %	2	5	40.00 %	0	1	0.0 %	-40.0 %			
SKIN	0	3	0.0 %	0	2	0.00 %	0	1	0.0 %	0.0 %			
UNKNOWN	1	9	11.1 %	0	3	0.00 %	1	6	16.7 %	16.7 %			
WASTING	4	16	25.0 %	0	8	0.00 %	4	8	50.0 %	50.0 %			
	17	122	13.93 %	7	61	11.78 %	10	71	14.08 %	0.36 %	6.36 %	0.06	

VLA	Pres	Overall			Prior years			2009			diff	SE Yr-Yr	z
		DNR	Subs	% DNR	DNR	Subs	% DNR	DNR	Subs	% DNR			
ABORTION	10	16	62.5 %	3	6	50.00 %	7	10	70.0 %	20.0 %			
DIARRHOEA	20	73	27.4 %	9	37	24.32 %	11	36	30.6 %	6.2 %	10.4 %	0.60	
FNDDOED	3	73	4.1 %	3	40	7.50 %	0	33	0.0 %	-7.5 %	4.7 %	-1.51	
GIT_XDIARR	2	5	40.0 %	2	5	40.00 %	0	0		-40.0 %			
HEALTHY	0	1	0.0 %	0	0		0	1	0.0 %	0.0 %			
LAME	1	18	5.6 %	1	8	12.50 %	0	10	0.0 %	-12.5 %			
MALAISE	6	28	21.4 %	2	12	16.67 %	4	16	25.0 %	8.3 %			
MUSC_SKEL	0	1	0.0 %	0	1	0.00 %	0	0		0.0 %			
NERVOUS	2	13	15.4 %	2	9	22.22 %	0	4	0.0 %	-22.2 %			
OTHER	2	8	25.0 %	0	1	0.00 %	2	7	28.6 %	28.6 %			
RECUMBT	2	10	20.0 %	1	6	16.67 %	1	4	25.0 %	8.3 %			
REPRO	5	8	62.5 %	3	5	60.00 %	2	3	66.7 %	6.7 %			
RESPIR	3	45	6.7 %	1	22	4.55 %	2	23	8.7 %	4.2 %	7.4 %	0.56	
SKIN	2	9	22.2 %	2	5	40.00 %	0	4	0.0 %	-40.0 %			
UNKNOWN	6	41	14.6 %	1	16	6.25 %	5	25	20.0 %	13.8 %	11.3 %	1.22	
URINARY	0	1	0.0 %	0	0		0	1	0.0 %	0.0 %			
WASTING	3	45	6.7 %	0	21	0.00 %	3	24	12.5 %	12.5 %	7.5 %	1.68	
	87	386	18.98 %	30	194	15.48 %	37	201	18.41 %	2.94 %	3.78 %	0.78	

The red highlighting of 'wasting' indicates a significant increase in DNR for this presenting sign compared to prior years.

Table 12: VIDA Overall Changes in DNR rates for Pigs by Syndrome to Q1 for 2009 and prior years

GB Syndrome	Overall			Prior years (2008 onwards)			2009			diff	SE Yr - Yr	z
	DNR	Subs	% DNR	DNR	Subs	% DNR	DNR	Subs	% DNR			
Circulatory	1	14	7.14 %	0	6	0.00 %	1	8	12.50 %	12.50 %		
Enteric	34	169	20.12 %	13	71	18.31 %	21	98	21.43 %	3.12 %	6.25 %	0.50
Musculo-skeletal	2	28	7.14 %	1	13	7.69 %	1	15	6.67 %	-1.03 %		
Nervous / Sensory	3	26	11.54 %	3	13	23.08 %	0	13	0.00 %	-23.08 %		
Reproductive	18	27	66.67 %	6	10	60.00 %	12	17	70.59 %	10.59 %		
Respiratory	8	96	8.33 %	4	54	7.41 %	4	42	9.52 %	2.12 %	5.69 %	0.37
Skin	1	10	10.00 %	1	5	20.00 %	0	5	0.00 %	-20.00 %		
Systemic & Misc	9	206	4.37 %	4	101	3.96 %	5	105	4.76 %	0.80 %	2.85 %	0.28
Unknown (999,990,991,980,970)	9	11	81.82 %	5	5	100.00 %	4	6	66.67 %	-33.33 %		
Urinary	0	5	0.00 %	0	1	0.00 %	0	4	0.00 %	0.00 %		

SAC

Syndrome	Overall			Prior years (2008 onwards)			2009			diff	SE Yr - Yr	z
	DNR	Subs	% DNR	DNR	Subs	% DNR	DNR	Subs	% DNR			
Circulatory	0	3	0.00 %	0	1	0.00 %	0	2	0.00 %	0.00 %		
Enteric	6	54	11.11 %	2	19	10.53 %	4	35	11.43 %	0.90 %	8.96 %	0.10
Musculo-skeletal	0	4	0.00 %	0	2	0.00 %	0	2	0.00 %	0.00 %		
Nervous / Sensory	0	4	0.00 %	0	0		0	4	0.00 %	0.00 %		
Reproductive	3	6	50.00 %	1	2	50.00 %	2	4	50.00 %	0.00 %		
Respiratory	2	22	9.09 %	1	16	6.25 %	1	6	16.67 %	10.42 %		
Skin	0	3	0.00 %	0	2	0.00 %	0	1	0.00 %	0.00 %		
Systemic & Misc	2	34	5.88 %	1	16	6.25 %	1	18	5.56 %	-0.69 %		
Unknown (999,990,991,980,970)	5	7	71.43 %	2	2	100.00 %	3	5	60.00 %	-40.00 %		
Urinary	0	1	0.00 %	0	0		0	1	0.00 %	0.00 %		

VLA

Syndrome	Overall			Prior years (2008 onwards)			2009			diff	SE Yr - Yr	z
	DNR	Subs	% DNR	DNR	Subs	% DNR	DNR	Subs	% DNR			
Circulatory	1	11	9.09 %	0	5	0.00 %	1	6	16.67 %	16.67 %		
Enteric	28	115	24.35 %	11	52	21.15 %	17	63	26.98 %	5.83 %	8.04 %	0.73
Musculo-skeletal	2	24	8.33 %	1	11	9.09 %	1	13	7.69 %	-1.40 %		
Nervous / Sensory	3	22	13.64 %	3	13	23.08 %	0	9	0.00 %	-23.08 %		
Reproductive	15	21	71.43 %	5	8	62.50 %	10	13	76.92 %	14.42 %		
Respiratory	6	74	8.11 %	3	38	7.89 %	3	36	8.33 %	0.44 %	6.35 %	0.07
Skin	1	7	14.29 %	1	3	33.33 %	0	4	0.00 %	-33.33 %		
Systemic & Misc	7	172	4.07 %	3	85	3.53 %	4	87	4.60 %	1.07 %	3.01 %	0.35
Unknown (999,990,991,980,970)	4	4	100.00 %	3	3	100.00 %	1	1	100.00 %	0.00 %		
Urinary	0	4	0.00 %	0	1	0.00 %	0	3	0.00 %	0.00 %		

Table 13: Overall Changes in DNR rates for Pigs by Syndrome for 12 months Q 2008/2 to Q 2009/1 and previous 5 years

GB Syndrome	Overall			Prior years (2008 onwards)			2009			diff	SE Yr - Yr	z
	DNR	Subs	% DNR	DNR	Subs	% DNR	DNR	Subs	% DNR			
Circulatory	1	14	7.14 %	0	6	0.00 %	1	8	12.50 %	12.50 %		
Enteric	34	169	20.12 %	13	71	18.31 %	21	98	21.43 %	3.12 %	6.25 %	0.50
Musculo-skeletal	2	28	7.14 %	1	13	7.69 %	1	15	6.67 %	-1.03 %		
Nervous / Sensory	3	26	11.54 %	3	13	23.08 %	0	13	0.00 %	-23.08 %		
Reproductive	18	27	66.67 %	6	10	60.00 %	12	17	70.59 %	10.59 %		
Respiratory	8	96	8.33 %	4	54	7.41 %	4	42	9.52 %	2.12 %	5.69 %	0.37
Skin	1	10	10.00 %	1	5	20.00 %	0	5	0.00 %	-20.00 %		
Systemic & Misc	9	206	4.37 %	4	101	3.96 %	5	105	4.76 %	0.80 %	2.85 %	0.28
Unknown (999,990,991,980,970)	9	11	81.82 %	5	5	100.00 %	4	6	66.67 %	-33.33 %		
Urinary	0	5	0.00 %	0	1	0.00 %	0	4	0.00 %	0.00 %		

SAC

Syndrome	Overall			Prior years (2008 onwards)			2009			diff	SE Yr - Yr	z
	DNR	Subs	% DNR	DNR	Subs	% DNR	DNR	Subs	% DNR			
Circulatory	0	3	0.00 %	0	1	0.00 %	0	2	0.00 %	0.00 %		
Enteric	6	54	11.11 %	2	19	10.53 %	4	35	11.43 %	0.90 %	8.96 %	0.10
Musculo-skeletal	0	4	0.00 %	0	2	0.00 %	0	2	0.00 %	0.00 %		
Nervous / Sensory	0	4	0.00 %	0	0		0	4	0.00 %	0.00 %		
Reproductive	3	6	50.00 %	1	2	50.00 %	2	4	50.00 %	0.00 %		
Respiratory	2	22	9.09 %	1	16	6.25 %	1	6	16.67 %	10.42 %		
Skin	0	3	0.00 %	0	2	0.00 %	0	1	0.00 %	0.00 %		
Systemic & Misc	2	34	5.88 %	1	16	6.25 %	1	18	5.56 %	-0.69 %		
Unknown (999,990,991,980,970)	5	7	71.43 %	2	2	100.00 %	3	5	60.00 %	-40.00 %		
Urinary	0	1	0.00 %	0	0		0	1	0.00 %	0.00 %		

VLA

Syndrome	Overall			Prior years (2008 onwards)			2009			diff	SE Yr - Yr	z
	DNR	Subs	% DNR	DNR	Subs	% DNR	DNR	Subs	% DNR			
Circulatory	1	11	9.09 %	0	5	0.00 %	1	6	16.67 %	16.67 %		
Enteric	28	115	24.35 %	11	52	21.15 %	17	63	26.98 %	5.83 %	8.04 %	0.73
Musculo-skeletal	2	24	8.33 %	1	11	9.09 %	1	13	7.69 %	-1.40 %		
Nervous / Sensory	3	22	13.64 %	3	13	23.08 %	0	9	0.00 %	-23.08 %		
Reproductive	15	21	71.43 %	5	8	62.50 %	10	13	76.92 %	14.42 %		
Respiratory	6	74	8.11 %	3	38	7.89 %	3	36	8.33 %	0.44 %	6.35 %	0.07
Skin	1	7	14.29 %	1	3	33.33 %	0	4	0.00 %	-33.33 %		
Systemic & Misc	7	172	4.07 %	3	85	3.53 %	4	87	4.60 %	1.07 %	3.01 %	0.35
Unknown (999,990,991,980,970)	4	4	100.00 %	3	3	100.00 %	1	1	100.00 %	0.00 %		
Urinary	0	4	0.00 %	0	1	0.00 %	0	3	0.00 %	0.00 %		