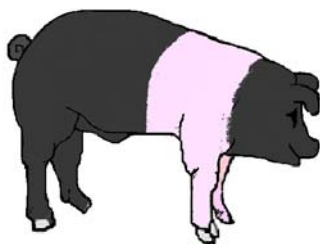


GB surveillance

Pig diseases

Quarterly Report: Vol Q3 2008

Date: 17th November 2008



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.

Porcine enterovirus A (PEV A) formerly known as PEV 8, CPE type II was identified from central nervous tissue collected as part of a five-day investigation into encephalomyelitis in young pigs. This virus has previously been associated with porcine infertility and nervous signs but without recent additions to the literature.

Multi-drug resistant *Brachyspira hyodysenteriae* isolated and increased incidence of swine dysentery reported particularly in East Anglia.

The industry continues to show much interest in disease eradication with particular attention to swine dysentery and PRRS.

There have been financial improvements with relation to meat prices but there is still some way to go before pig farming can be determined as profitable.

1) INTRODUCTION

This is the second 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

Pig Meat Consumption

There has been a 5% reduction in pig meat consumption across the EU compared to last year with the exception of Germany, which has increased consumption by 3.4%. The United Kingdom is the fourth lowest consumer of pig meat in the EU with an average consumption of 26 kg/person/ annum

Trade

The United Kingdom has resumed exporting to China and this is primarily made up of offal material that is not used in the UK. This trade is worth about £17,000,000 per annum.

One supermarket will be sourcing its bottom range of pig meat entirely from outside of the United Kingdom whilst another will only stock British pork in its welfare range.

EU

European law on identification and registration of pigs has been consolidated in current Directive 2008/7/EC. This has not led to any changes of importance to UK producers or veterinarians.

Fertiliser/seed

Fertiliser and seed prices may each rise by 48% before next years crops are planted and consequently there may be a fall in profits next year. Higher fertiliser prices will occur in the UK because of the weak pound.

Production

There is room for improvement from UK producers. At the moment the top 10% of EU pig farmers produce 26.38 pigs/sow/year compared with the average UK producer with 23 pigs/sow/year. If UK producers reached the production levels of the EU top 10% for pigs produced/sow/year and were also in the top 10% for numbers born alive, this could result in the rearing of 28.79 pigs/sow/year. This would assist the financial situation for pig farmers as the average UK cost of production is 140-145p/kg. At present the price received by producers is 135.91p/kg.

Global cereal supplies

There is more wheat available than before. Wheat production worldwide has increased 11.4% to reach a record of 680.20 million metric tons. Major increases have been seen in Europe, Russia and Ukraine. The US corn crop for 07-08 was the fourth biggest ever at 2.98 billion bushels and as a consequence the corn prices have dropped from \$7.54/bushel to \$3.81/bushel.

Intact males

Boars raised for meat production are not castrated as a general rule. To avoid taint producers are currently sending pigs to slaughter earlier than the optimum point on the growth curve. The Pfizer anti-testosterone vaccine has been made available in Switzerland. It improves feed conversion and produces a leaner carcass. In addition, because it reduces testosterone there is less aggression and boars are easier to manage and less likely to injure one another. The meat quality tests show it is as good as castrates or gilts. There is zero meat withdrawal and no safety issues. The vaccine prevents testosterone and androsterone (boar taint compounds). Both of these break down to the third component of boar taint skatole.

2.1 Demographics, submissions and carcasses

In every country in Europe, the breeding herd has reduced in size. When comparing June 2008 with June 2007 there has been a 9% fall in breeding pigs across Europe. If the trend continues, there will only be 13.68 million sows compared with 15.03 million in December 2007. This is the lowest that the European breeding herd has been for 20 years.

In England census figures show a 7.8% reduction in the breeding herd from 462, 000 in 2006 to 410, 000 in 2008. In Scotland census figures show an 8% reduction in breeding sows from 31,030 to 26,550.

2.2 Diagnostic submissions and carcasses

Table 1 Pig Diagnostic Submissions and Carcasses, 2004- 2008 (Q3 only)

Table 2 Pig Diagnostic Submissions 2004 – 2008 for England, Scotland and Wales

Table 1

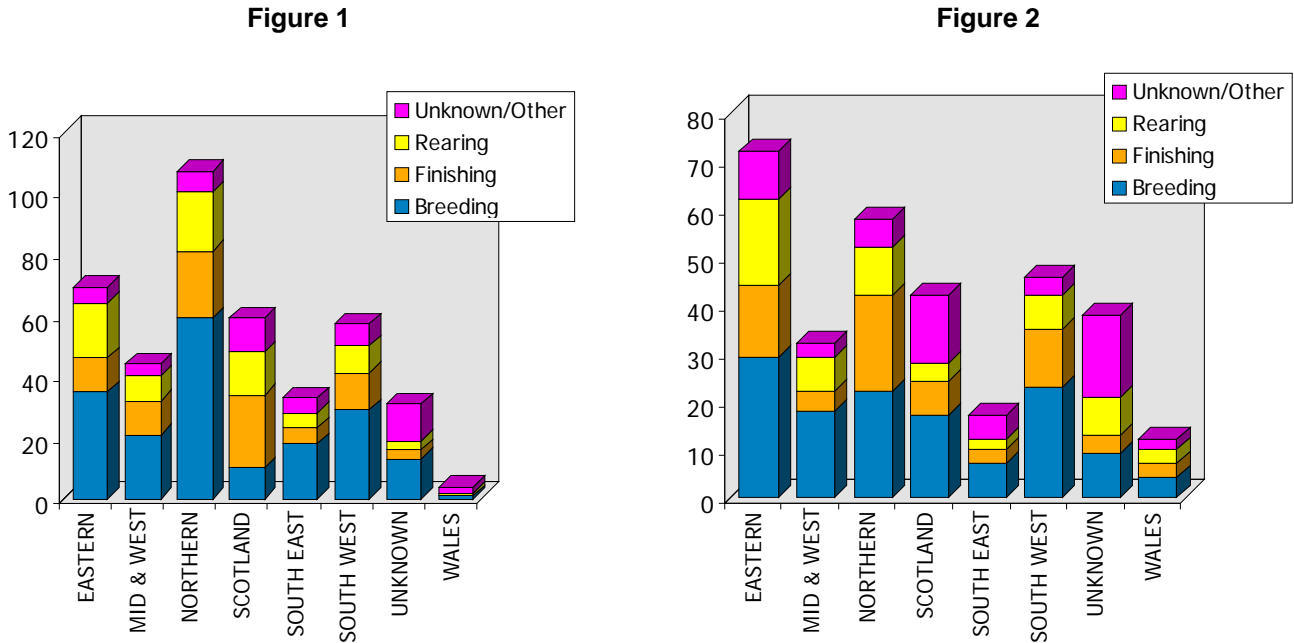
July – Sept Quarter	Submissions			Carcasses		
	England and Wales (E&W)	Scotland	Total	E&W	Scotland	Total
2004	329	91	420	270	61	331
2005	260	112	372	235	65	300
2006	261	156	417	214	50	264
2007	247	70	317	193	42	235
2008	305	99	404	263	86	349

Table 2

All Years 04 –08	Breeding	Finishing	Rearing	Unknown/Other	Sum:
EASTERN	118	63	130	71	382
MID & WEST	97	43	34	29	203
NORTHERN	169	103	71	47	390
SCOTLAND	29	32	19	208	288
SOUTH EAST	62	35	16	33	146
SOUTH WEST	121	65	42	27	255
UNKNOWN	39	20	18	147	224
WALES	11	10	12	9	42
Sum:	646	371	342	571	1,930

Carcase submissions for 2008 are in excess of those for the corresponding quarter in 2007. This may reflect the improvement in pig prices in 2008 although there is still some way to go until the industry is fully recovered.

GB Diagnostic Submissions, July - September 2008 (Figure 1) and 2007 (Figure 2)



2.2 The Meteorological Office report

In July, mean temperatures were slightly above average in most of England and Wales but more so in Scotland (averaging more than 1°C). Rainfall was generally above or well above average across most of England and Wales, but close to average across East Anglia. Rainfall over Scotland ranged from below average across the north-west to above average across the south-east.

In August, mean temperatures were slightly (0.5-1°C) above average in all of GB but it was a very wet month across GB (about 150% of average rainfall for August) with widespread flooding in parts of eastern Scotland.

In September, mean temperatures were generally close to average across England and Wales but slightly above average across Scotland. Wales had its coolest September since 1994. Rainfall varied widely – with much less than usual in Scotland and more south of the border, especially in Northern England.

2.3 Notifiable Disease Reported

No suspected incidents of Notifiable Disease that required statutory laboratory investigations were reported.

2.4 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**

July to September Quarter	Breeder	Breeder Fattener	Breeder Rearer	Fattener	Rearer	Rearer Fattener	Other	Total Visits
2004		1	1	1				3
2005		1	2	5		3	4	15
2006	3			14	3	13	8	41
2007	2		1	4		4	7	18
2008			1	2	1		2	6
Total	5	2	5	26	4	20	21	83

Salmonella advisory visits to breeder farms that were positive following the EU breeder survey started this quarter. Increased numbers of visits are likely to feed through into the next quarter. Visits are being undertaken to all breeder farms from which salmonellae were isolated rather than only from those so called "top 5" Salmonella serotypes. Other advisory visits remain restricted, as there are reports that farms do not have enough staff to allow a VIO to be accompanied on the visit, as they continue to keep staffing levels low to try and assist profitability.

This work is part of the ongoing EU survey of Salmonella prevalence in breeding pigs. The survey will run until December 31st 2008. Results from the survey will be used in informing decisions about targets for Salmonella prevalence which will be set by the EU. A National Control Programme for Salmonella in pigs will be instituted to aid this process once targets have been set. It is unlikely that targets for Salmonella prevalence will be set before 2010 with NCP likely to be introduced in 2011.

2.5 Food Safety Incidents

No suspected food safety incidents involving pigs were reported in the third quarter of 2008 in England, Scotland or Wales.

3) ENDEMIC DISEASE SURVEILLANCE

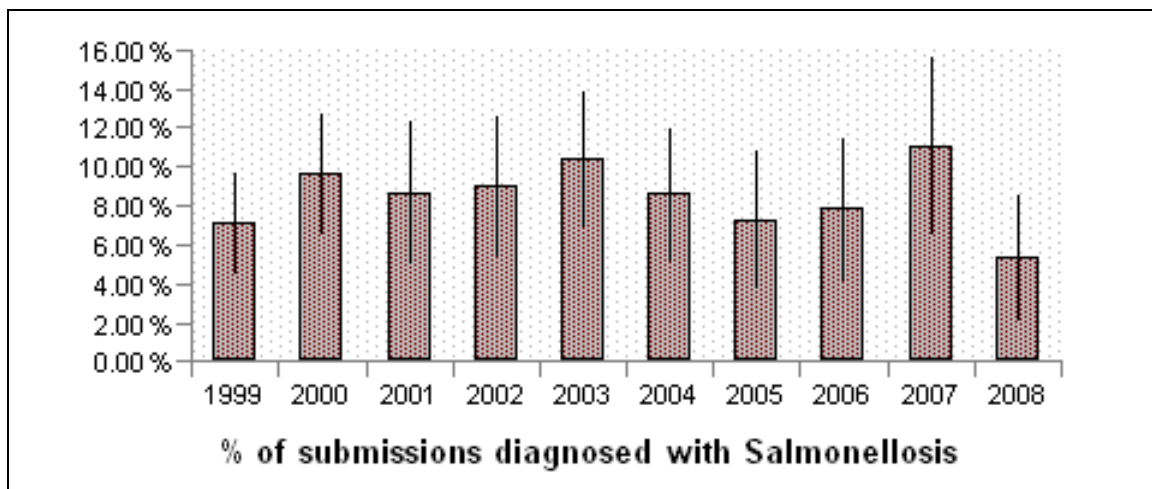
A note about the disease trends charts.

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

Thirteen cases of clinical disease in pigs due to salmonellosis were diagnosed in the third quarter of 2008. This comprises 5.18% of all porcine diagnostic submissions and represents a statistically insignificant drop in diagnostic rate from this quarter last year (see figure 3). It also represents a drop from the previous quarter (Q2 2008) wherein salmonellosis accounted for 8.9% of all pig diagnostic submissions (data not shown).

Figure 3: VIDA Incidents of salmonellosis in pigs during Q3 of 2008 as a percentage of diagnosable submissions.



(Vertical lines indicate 95% confidence intervals)

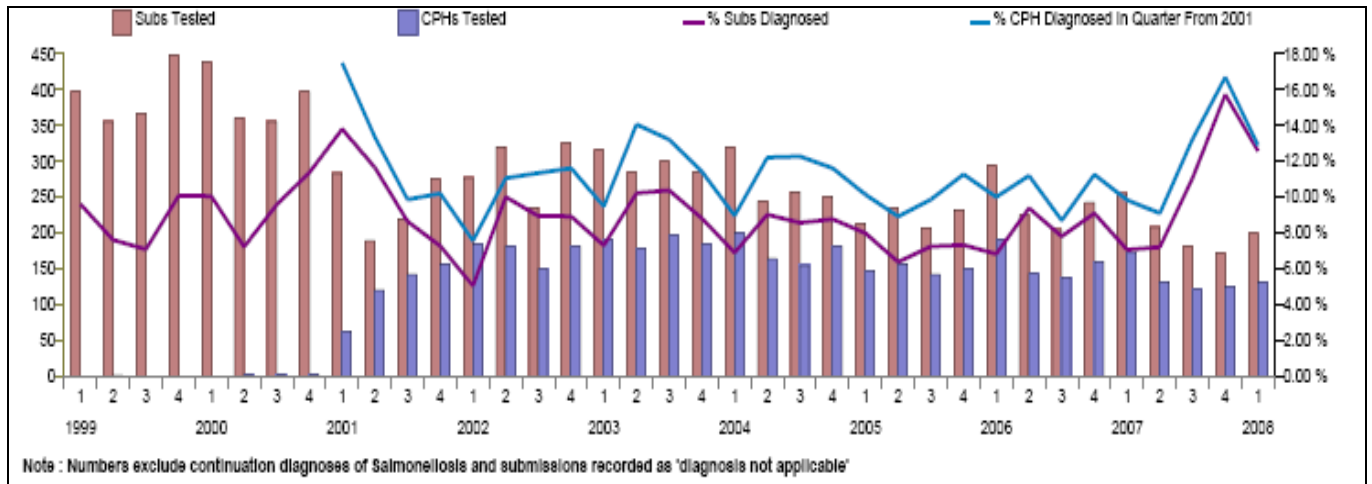
The predominant serotype this quarter was again *Salmonella* Typhimurium (STM), which was isolated from eleven of thirteen (85%) cases investigated under the endemic diseases project. *Salmonella* Derby was the only other serotype occurring in the quarter under this project, accounting for 15% of isolates.

Of the *Salmonella* Typhimurium (STM) isolates, the predominant phage type was ST PT U288, accounting for 62.5% of STM isolates. Next was ST PT 193, which accounted for 25% of isolates. ST PT 208 and an untypeable ST occurred once each.

Seasonal trends in diagnoses of salmonellosis in pigs as a percentage of diagnosable submissions are shown in figure 4. The most recent quarter from which data are available is Q1 2008. This graph highlights an increase in the percentage of submissions diagnosed with salmonellosis (as a proportion of diagnosable submissions) in mid 2007. This trend is not statistically significant and has not been maintained in the first 3 quarters of 2008 (only Q1 2008 shown on figure 4).

Figure 4: Seasonal trends in VIDA Incidents of porcine salmonellosis for England and Wales as a percentage of diagnosable submissions, Q1 1999-Q1

2008.



Of the thirteen recorded cases of salmonellosis in pigs in this quarter, four diagnoses were made from submission of a carcase, one from a lung submission and the remainder (eight) from faeces or rectal swabs. Concurrent disease was identified in all cases but one.

Salmonellosis can affect pigs of any age, but is most commonly recorded in grower/ finisher age pigs. This month however was notable for two investigations into clinical salmonellosis contributing significantly to ill thrift, scour and wasting in younger pigs, reared outdoors, one involving five-week-old pigs; the other involving eight-week-old pigs. Details of some of the *Salmonella* investigations undertaken this quarter are outlined below:

- In the five-week old pigs diagnosed with salmonellosis typical gross postmortem changes of fibrinonecrotic enterotyphlocolitis were accompanied by polyserositis caused by *Streptococcus suis* serotype 2. Gastric infarctions were seen histologically alongside the septicaemic salmonellosis.
- Two live 8-week-old rearing pigs were submitted as typifying a problem of ill thrift, scouring and wasting among a group of 1200 weaners. As well as enterotyphlocolitis due to *Salmonella* Typhimurium PT208, infective arthritis and PRRS viraemia were present. It is generally thought that passive and acquired immunity to *Salmonella* in pigs is serotype and phage type-specific. This means that mixing of pigs from different sources may result in suboptimal immunity in some pigs, as pigs encounter new serotypes when mixed that they have had no previous exposure to. Problems are especially likely to arise in the face of concurrent disease challenge by other pathogens, e.g. *Streptococcus suis* and PRRSv.
- Fixed and fresh lung samples were submitted as part of an investigation into respiratory problems in growing pigs. The lung cultured positive for *Pasteurella multocida* and *Salmonella* Typhimurium PT193, and a PCR for the presence of PRRSv RNA performed on the fresh lung was positive. Immunosuppression and direct respiratory disease due to PRRSv were thought to have predisposed to septicaemic salmonellosis.

- Two dead pigs were examined to investigate ill thrift, coughing and scour among a group of 100 pigs. Multiple pathological processes were identified including chronic low-grade pneumonia, PDNS, PRRS viraemia, and chronic active enterocolitis. *Salmonella* Typhimurium PTU288 was isolated in a septicaemic distribution implying that septicaemic salmonellosis will have been the cause of death, probably prompted by debility as a result of multiple insults.
- An enquiry was received from a proactive specialist pig veterinary surgeon whose client is planning a total herd depopulation/ repopulation for eradication of PRRSv and *Mycoplasma hyopneumoniae*. The farm has historically suffered from sporadic bouts of disease in finishers, manifesting as scour, sudden deaths and reduced growth performance, always associated with *Salmonella* Typhimurium PTU288. ZAP scores (now ZNCP scores) have been variable. This veterinary surgeon was wondering how best to use this opportunity to improve salmonella control measures, both from the point of view of pig health and productivity, and because of the political focus on *salmonella* in the UK pig industry as a source of zoonotic infection for humans. The pig-free down time associated with the depopulation would seem to present an excellent opportunity to break the cycle of infection where pigs acquire *Salmonella* from contaminated buildings and from infected older pigs in front of them. The problem then arises of producing a *Salmonella*-free weaner to move into *Salmonella*-free accommodation.
- It is at present impossible to source *salmonella* free breeding stock. VLA is collaborating in this case to effect adoption of likely effective interventions such as batch production of growing pigs, All-in All-out policies, scrupulous cleaning and disinfection of buildings between batches, and a firm focus on rodent control during the pig-free periods. Given that immunity is phage-type specific, concerns were raised about introducing new phage types with incoming high health gilts. Also the risk of creating a naïve population, which may be highly susceptible to introduction of new infection, was considered.

3.2) Brucellosis

19 cultures for *Brucella suis* were undertaken in Q3 and were all negative. A total of 46 cultures have been made in the first three quarters of 2008.

Fulfilling their role as OIE Reference Laboratory for brucellosis, staff at VLA Weybridge were involved in trials assessing proposed International Standard sera that will be used for *Brucella suis* and *Brucella melitensis* species specific tests. The six other OIE Reference Laboratories (Argentina, France, Germany, Italy, Canada and Israel plus three recognised European laboratories in Belgium, Portugal & Spain) all assessed the Standards in the full range of tests used for diagnosis, i.e. (complement fixation test (CFT), ELISAs and Rose Bengal test (RBT)). Results were discussed at OIE headquarters in Paris recently and minimum standards of sensitivity for each test were agreed. If accepted by the International Committee, changes will be made to the on-line version of the OIE Manual of Diagnostic Tests & Vaccines in May 2009. Sera will be made available to all National Reference Laboratories and the use of such should assist in the harmonisation of diagnostic tests used for diagnosis and International Trade.

False positive serological reactions (FPSR) are a major problem in serodiagnosis of brucellosis, attributed to the presence of antibodies which cross-react with the LPS antigen used in the assays. For example, following an outbreak of brucellosis in pigs in Germany Defra received a notification that the farm in question imported pigs from a farm in England. An on-farm investigation for porcine brucellosis on that farm was immediately undertaken. Detailed examinations of production records gave no indication of porcine brucellosis and revealed that the farm had no unusually high infertility records. The animals had been regularly visited by vets that were pig specialists. Additionally, animals from the same farm had been sent to other farms in the UK with breeding pigs without problems. There was no evidence of transmission from this farm but with the continuing cross reaction problem it makes it increasingly difficult to clear a 'suspect' herd.

3.3) Streptococcal Infections

**Table 4:
Streptococcus suis Figures June to September 2005 - 2008**

Year/ Type	1	2	3	4	5	7	8	9	10	12	14	15	16	25	31	33	1/2	UT	Totals
2005	2	8	3			1												2	16
2006		3							1							1			5
2007		19	3	1		3		4	1				1						32
2008	2	11	1	2	1	2	1	3			1							1	25

UT = Untypable.

Table 4 shows that *Streptococcus suis* type 2 remains the predominant isolate this quarter, with the overall spread of types similar to previous quarters. The overall number of isolates is down on the equivalent quarter from 2007. As Q2 was higher than normal this year it is possible that the average rate per year is roughly in line with previous years.

There was concern that there has been an increase in *S. suis* isolates resistant to 3 or more antibiotics when looking at years 2004, 2006 and 2008. Further analysis is being undertaken regarding this recent finding and conclusions will be reported in QR4. Table 5 shows the isolates, the sites of isolation, the age of pig from which isolated and whether resistant to antibiotics.

Table 5: Breakdown of *Streptococcus suis* isolates for the first 6 months for 2004, 2006 and 2008 showing age of pig from which isolated, site, serotypes and antibiotic resistance

Year	Serotypes													Age of pig from which isolated -weeks						Site from which isolated					Antibiotic resistance					
	1/2	1	2	3	4	7	8	9	14	16	U/T	1-4	5-8	9-12	13-16	17-20	U/k	Brain	Lung	Joint	Sept	Tonsil	Fully S	R1	R2	R3	R4+			
01/04 – 06/04	0	3	25 (42%)	11	5	1	7	0	1	2	1	0	2	1	2	17	22	8	8	2	9	36	4	3	7	13	17	8	21	3
01/06 – 06/06	1	4	22 (65%)	2	2	1	0	1	0	1	0	0	0	0	9	6	6	6	5	2	18	9	3	3	1	8	13	7	6	3
01/08 – 06/08	1	4	27 (52%)	1	1	4	1	4	0	0	0	2	0	6	8	20	11	4	5	2	16	20	3	10	1+1fsc	11	11	5	24	3
01/04 – 06/04	Type2																								3	11	4	7	0	
01/06 – 06/06	Type2																								0	10	5	5	2	
01/08 – 06/08	Type2																								4	9	1	13	2	

UT = Untypable

R1 = resistant to one antibiotic

R2 = resistant to two antibiotics

R3 = resistant to three antibiotics

R4 = resistant to four or more antibiotics

Fully S = fully sensitive to all antibiotics against which tested

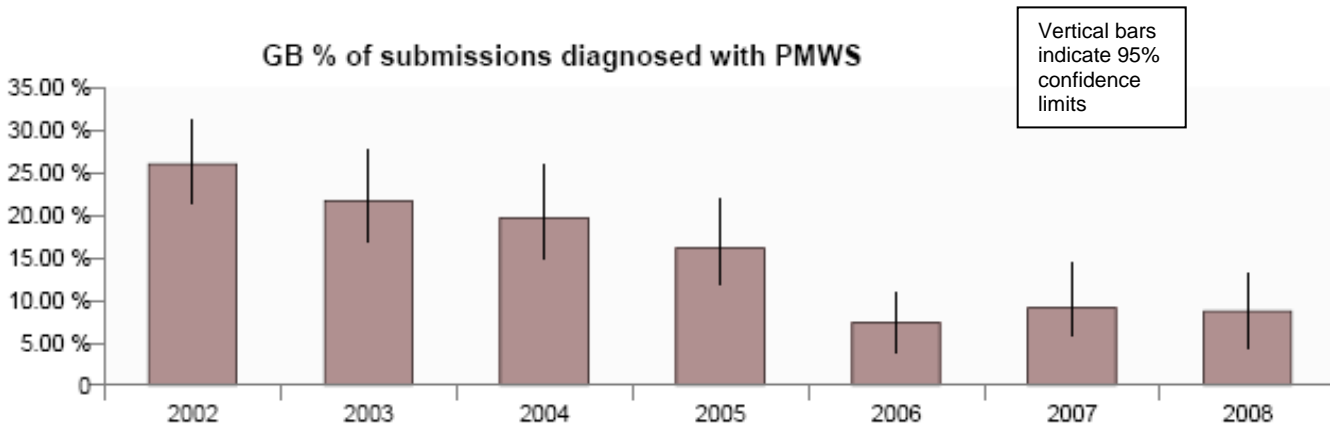
Sept = septicaemic distribution

fsc = foetal stomach contents

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) PMWS

Figure 5: Percentage of submissions diagnosed with PMWS in Q3 compared with previous years same quarter



There was little difference in the rate of post weaning multisystemic wasting syndrome (PMWS) diagnoses from the same quarter last year, although the number of cases diagnosed fell from 12 last quarter to six this quarter so far. The numbers still remain too small to reflect any impact from vaccination.

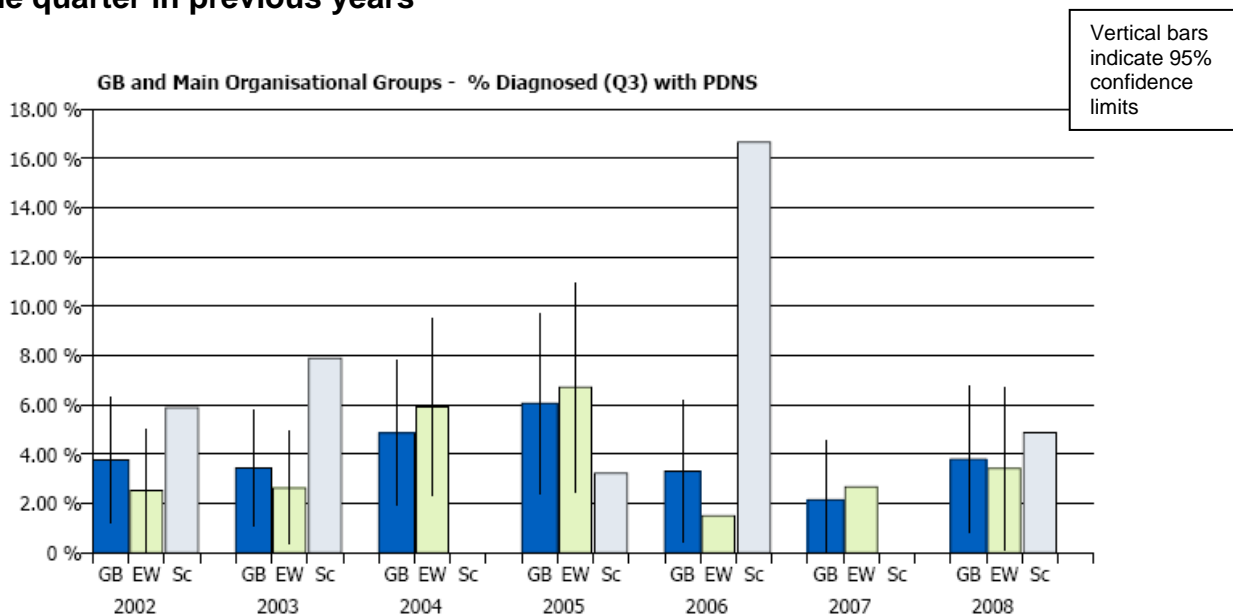
- In one case PMWS was diagnosed in 12-14 week old finishing pigs from an indoor 250-sow breeder finisher unit where, in the last month, two to three pigs per batch of 100 were coughing, scouring and wasting with poor response to antibiotic treatment. Vaccination of sows for PCV2 was ongoing for one year with a good response. The farmer selected three typical early cases which had reduced growth for one week. All were in fair body condition, one was pyrexemic and coughing. Bronchopneumonia and scour were present in two of the pigs; *Pasteurella multocida* and *Streptococcus suis* 2 were isolated from the lungs of both pigs and PRRS virus was detected in the pig with the most severe lung lesions. Histopathology revealed lymphoid changes typical of PCV2 together with intracytoplasmic viral inclusions confirming a diagnosis of PCV2 associated disease, with lung lesions also indicating PCV2 associated respiratory disease. In another pig, which was scouring without lung lesions, *Brachyspira pilosicoli* was isolated and histopathology suggested past PCV2 activity. In this pig there was also a moderately severe interstitial nephritis. Thus complex multifactorial disease was diagnosed in which PCV2 associated disease was a component. The reasons for a rise in incidence of disease in the finishers were speculated to be PRRS virus infection playing a role in the respiratory disease (the herd had been considered to be stable for PRRSV) and the fact that recent larger litter sizes (up to 15 live born) may have meant that some piglets received inadequate colostral protection on which efficacy of sow vaccination for PCV2 depends.
- A recent questionnaire based pilot study looked at cases of porcine circovirus associated disease between 1st May and 30th September 2008 and the history of PCV2 vaccine use. Of 15 cases of PCV2 associated disease identified during this period further information was available for 11. Of these three were in herds using sow vaccination and another was in a herd where the sow vaccination status for PCV2 was unknown. There were no cases found where piglet vaccination for PCV2 was undertaken. One of the cases had only PDNS, which is still of uncertain aetiology and which vaccines make no specific claims to protect against. Combined diagnoses with PMWS included PCV2 related pneumonia, two cases of *Streptococcus suis* and PRRS infection were seen. In the case with concurrent PCV2 associated pneumonia there was also *Streptococcus suis* infection and arthritis recorded.

- In one case a visit was carried out to investigate disease manifesting as PMWS on a closed 80-sow indoor farrow-finish unit which had previously been completely free of clinical signs of porcine circovirus associated disease (PCVAD). Two affected grower/finisher pigs had been submitted to the VLA for post mortem examination although histological examination of tissues did not confirm typical PCV2-associated changes. Further wasted pigs were necropsied and at least one demonstrated typical histological lymph node changes. Also demonstrated on-farm was moderate to severe pneumonia due to *Mycoplasma hyopneumoniae*, a disease from which the unit was previously considered free. The practice of introducing pigs at 40kg into the finishing house without disinfection of pens was considered to have increased PCV2 challenge to incoming pigs. Madec’s 20-point plan was suggested as an adjunct to minimise the impact of PCV2 on this unit, and vaccination protocols against enzootic pneumonia and PCV2 were contemplated.

3.5) PDNS

Figure 6 shows that cases of PDNS increased in GB (but not with statistical significance) compared with this quarter last year. Figures remain static when compared with the previous quarter (see histogram below).

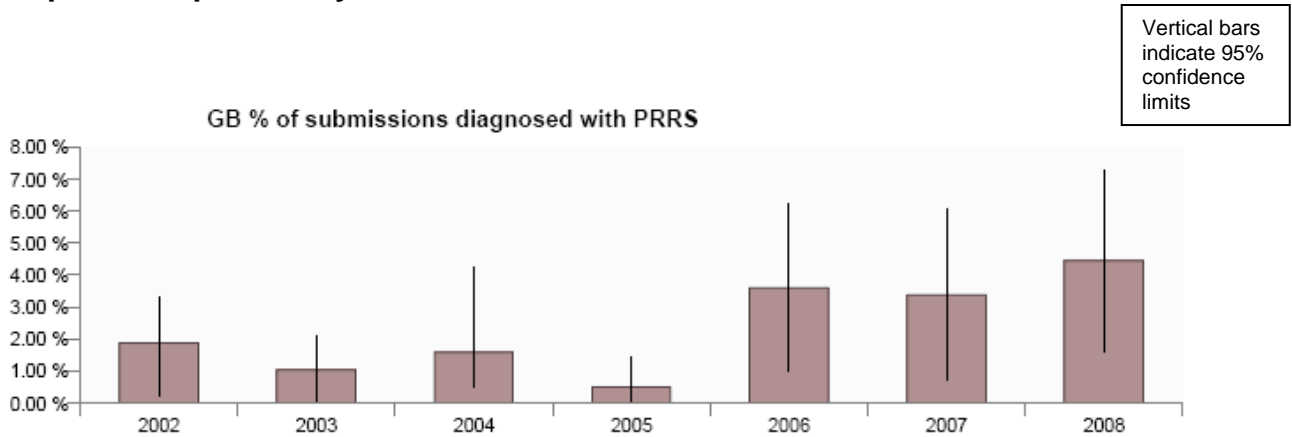
Figure 6: Percentage of submissions in Q3 diagnosed with PDNS compared with the same quarter in previous years



3.6) PRRS

The percentage of diagnosable submission confirmed with PRRS infection remained at the higher level we have become used to over the last two years (although this higher level does not represent a statistically significant increase from previous years) (see Figure 7). Of eight cases of PRRS infection diagnosed in this quarter in England and Wales, three were PRRS related pneumonia and five were systemic PRRS infection. In no cases were these infections diagnosed without concurrent disease being diagnosed, although no one additional diagnosis was prominent amongst these cases. Two cases of PRRS virus related reproductive diseases were also diagnosed this quarter. In one of these there was a sudden onset of early farrowing with a high rate of stillbirths and non-viable piglets. The herd was regularly vaccinated against parvovirus and erysipelas. The reproductive disease component of PRRS is not represented in the analysis below.

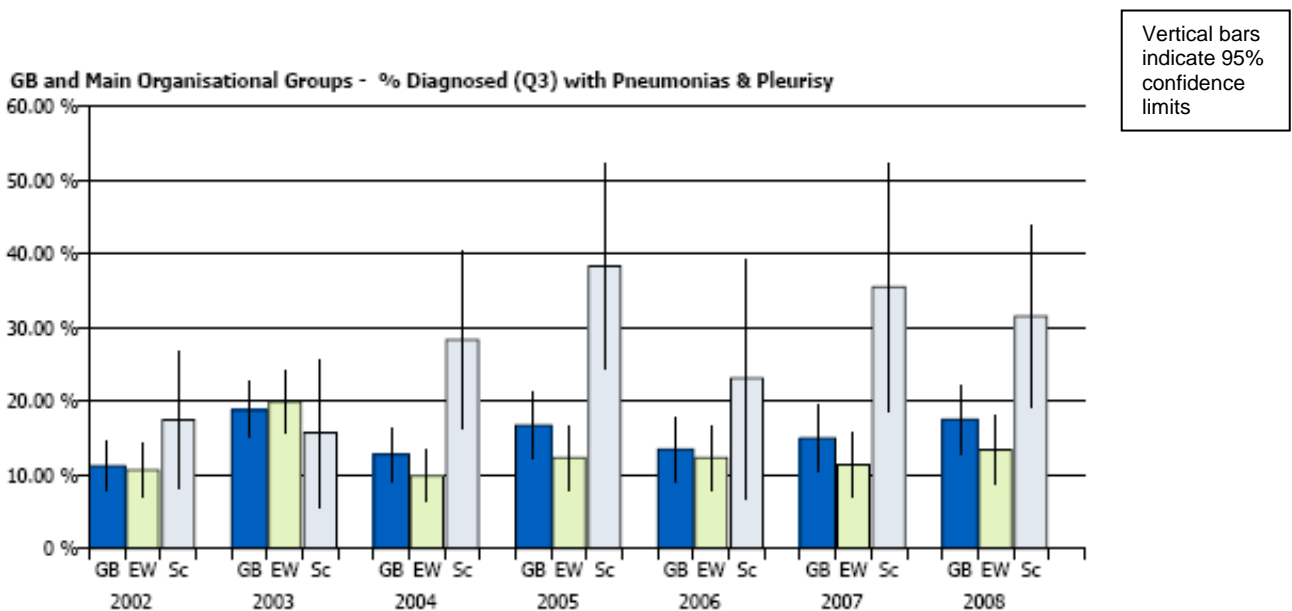
Figure 7: Percentage of submissions diagnosed with PRRS in Q3 compared with the same quarter in previous years



3.7) Respiratory Disease

The quarterly percentage of relevant diagnostic submissions with a diagnosis of pneumonia and/or pleurisy (excluding PRRS virus and PCV2 associated diseases) was slightly increased from the same quarter last year. Scotland recorded a greater percentage of cases from their diagnosable submissions compared with England and Wales (see Figure 8).

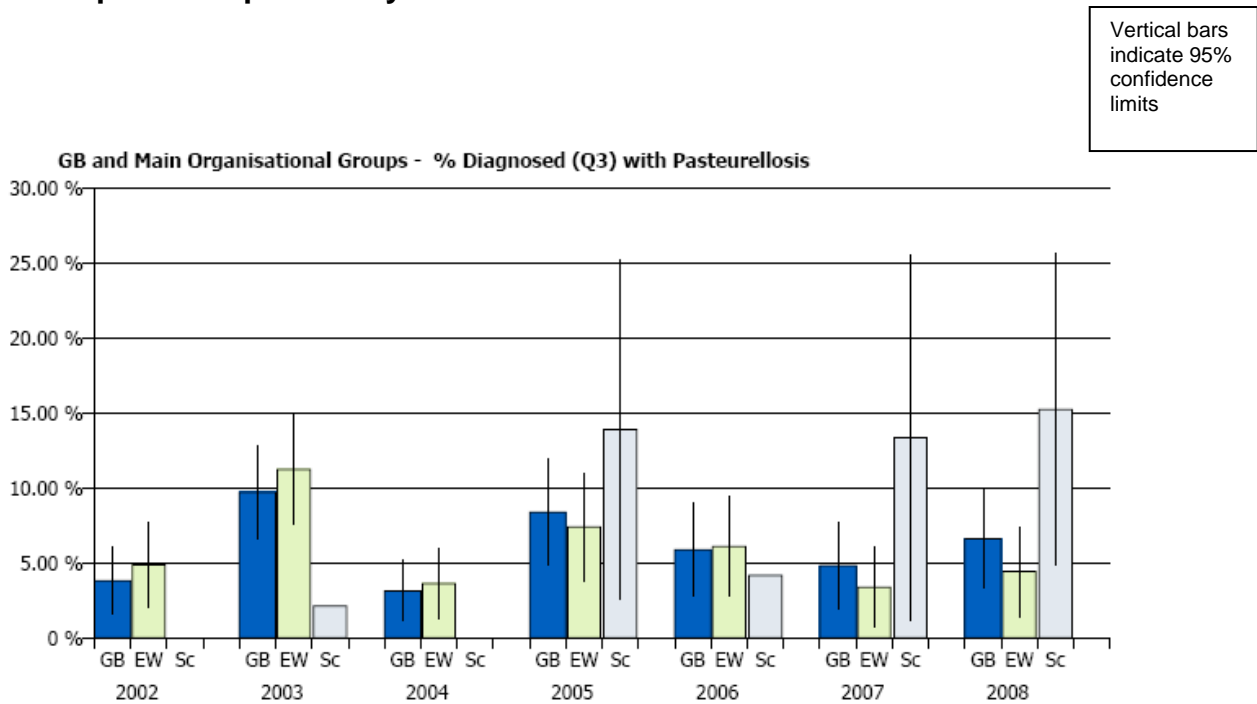
Figure 8: Percentage of submissions with a history pneumonia and pleurisy in Q3 compared with the same quarter in previous years



3.7.1 Pasteurellosis

There was an overall rise in GB but a fall in Scotland (although without statistical significance) in diagnoses of pasteurellosis compared with the same quarter last year as shown in Figure 9.

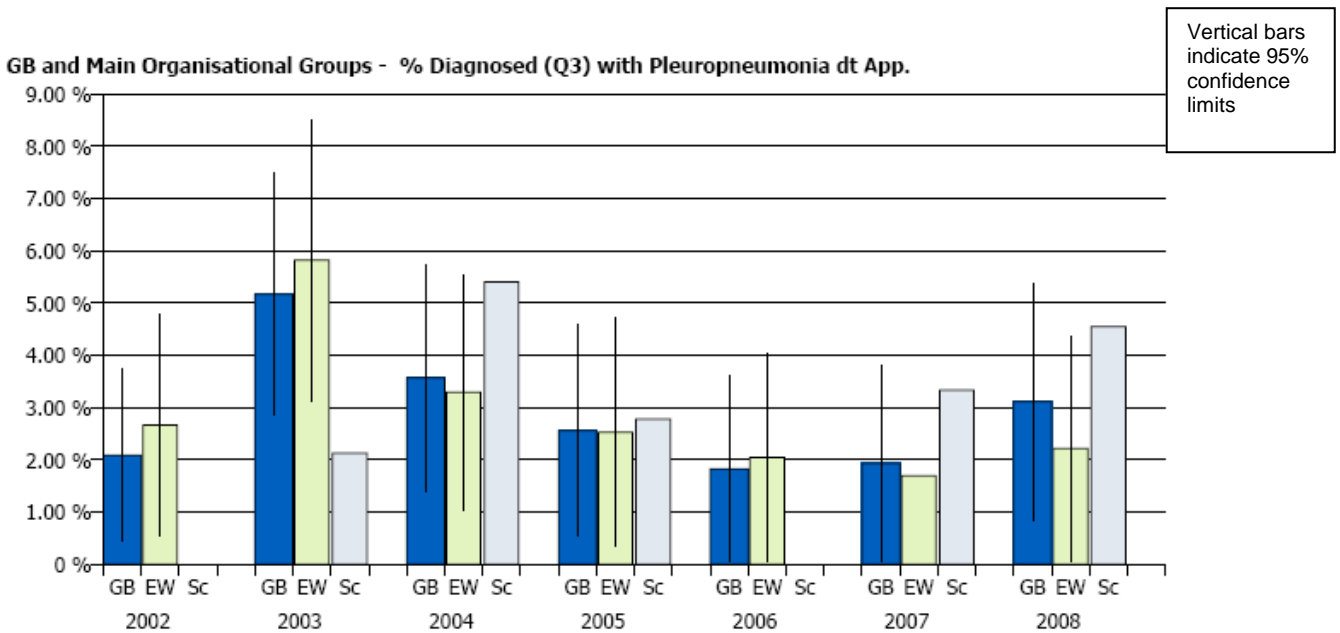
Figure 9: Percentage of submission diagnosed with pasteurellosis in Q3 compared with the same quarter of previous years



3.7.2 Actinobacillosis

Figure 10 shows a slight but not statistically significant increase in *Actinobacillus pleuropneumoniae* pneumonia compared with Q3 2007

Figure 10: Percentage of submissions with a history of respiratory disease where pleuropneumoniae due to *Actinobacillus pleuropneumoniae* was diagnosed

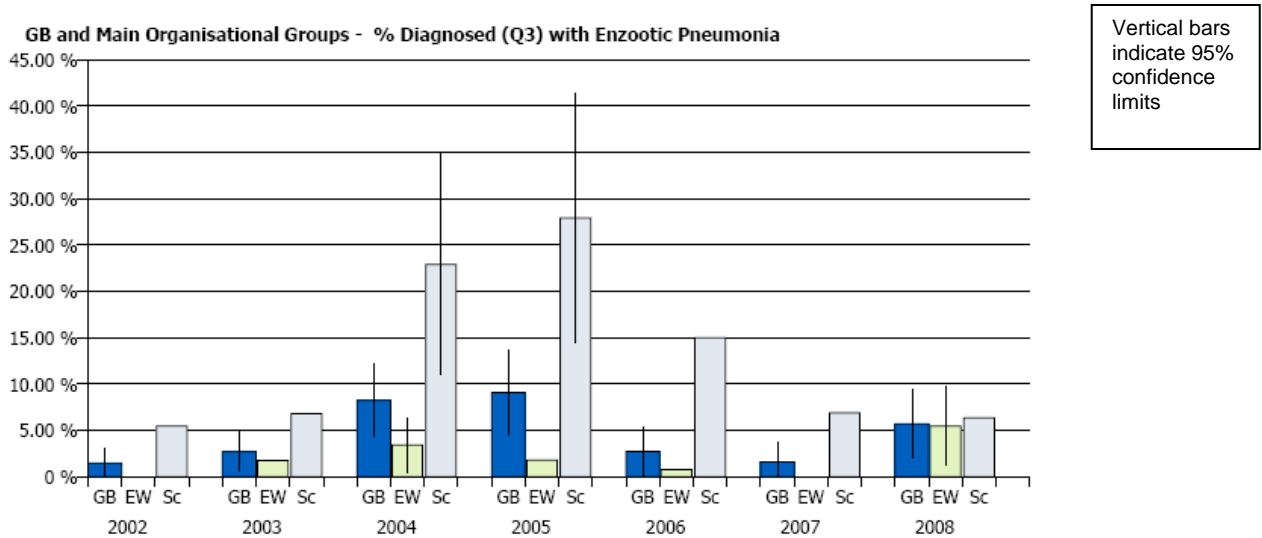


3.7.3 Enzootic pneumonia

The numbers of cases diagnosed with enzootic pneumonia in England and Wales appears to be increasing. In the 3rd quarter of 2008 six cases were diagnosed compared to 1-2 cases diagnosed in the 3rd quarter in the previous three years. By comparison the diagnostic rate for this condition in Scotland remained fairly static. The percentage of diagnosable submissions data (see Figure 11) reflects this.

It is possible that the increase in enzootic pneumonia diagnosis reflects the fact that pig producers are having to choose between PCV2 and enzootic pneumonia vaccinations as margins are too narrow to allow for both. It is also possible that the change in diagnostic procedures where only DGGE (PCR) is performed for *Mycoplasma* diagnosis (rather than culture) has increased the diagnostic rate.

Figure 11: Percentage of submissions with a history of pneumonia where enzootic pneumonia was diagnosed in Q3 compared with the same quarter in previous years



3.7.4) Swine Influenza

Table 6 showing the 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	46	4 (8.7%)	23	1 (4.3%)	11	0 (0%)	22	3 (13.6%)	102/8
2008	84	3 (3.6%)	64	4 (6.3%)	72	2 (2.8%)	-	-	220/9

All isolates recovered in 2008 have been the avian type H195852.

3.8) Alimentary Disease - See section 5.

3.9) Mycoplasmas

Pfizer have agreed to fund the VLA Mycoplasma Group to do further work to assess a vaccine against *Mycoplasma hyorhinis*.

3.9.1) *Mycoplasma* Surveillance

40 samples from 27 cases were submitted. *M. hyopneumoniae* was identified on 9 occasions and once mixed with *M. hyorhinis*: all were from lung samples. Additionally, *M. hyorhinis* was detected 6 times from lungs. *M. hyosynoviae* was identified three times, 1 from fibrin, 1 from pericardial fluid and 1 not stated. *M. arginini* was identified once from a joint sample.

* VLA Starcross investigated a respiratory problem on an outdoor pig unit, characterised by coughing with high morbidity and low mortality. A dual respiratory problem of swine influenza and enzootic pneumonia was suspected on lung histopathology, with ulcerative lesions in the airways and lymphoplasmacytic cuffing. The diagnosis was confirmed by immunohistochemical demonstration of swine influenza virus and demonstration of *Mycoplasma hyopneumoniae* by DGGE.

* VLA Thirsk investigated coughing affecting 50% of a group of 100 pigs; 24 animals had died. Post mortem examination confirmed pneumonia and polyserositis. PCR detected the presence of PRRS virus in mediastinal lymph node in one pig, and *Streptococcus suis* and *Haemophilus parasuis* were isolated from lung. The confirmation of *Mycoplasma hyorhinis* in lung tissue further extended the multifactorial aetiology.

* VLA Shrewsbury investigated respiratory and enteric signs in three-month-old pigs. A range of pathogens were identified: *Mycoplasma hyopneumoniae*, *Salmonella* Typhimurium, *Pasteurella multocida*, *Arcanobacterium pyogenes* and PRRS virus. There was also evidence of PMWS by histopathology.

3.9.2) *Mycoplasma* News from Publications

Chen *et al.*, 2008 tested DNA cocktail vaccines of *M. hyopneumoniae* in mice. Each antigen tested induced a strong Th1-polarized immune response, but only the P46 gave a serum IgG response. The P97 from commercial bacterin was not recognised by serum antibodies in mice indicating potential lack of expression of this important antigen in inactivated whole-cell vaccines.

Porcine infectious anemia is caused by the unculturable haemotrophic *Mycoplasma suis*. A prevalence study by Ritzmann *et al.* (2008) in Germany reports that *M. suis* was detected in 164 out of 1176 feeder pigs (13.9%) and on 79 out of 196 pig farms (40.3%).

Experimental infections of pigs with different pathogens (PRRS virus, Porcine circovirus 2, swine influenza virus, porcine respiratory coronavirus, *M. hyopneumoniae* and *B. bronchiseptica*) showed that only *M. hyopneumoniae* and *B. bronchiseptica* were detected in expired air (Herrmann *et al.*, 2008).

References

Chen *et al.*, 2008. Evaluation of immune response to recombinant potential protective antigens of *Mycoplasma hyopneumoniae* delivered as cocktail DNA and/or recombinant protein vaccines in mice. *Vaccine*. **26**: 4372-4378. E pub.

Herrmann *et al.*, 2008. Detection of respiratory pathogens in air samples from acutely infected pigs. *Can. J. Vet. Res.* **72**: 367-370.

Ritzmann *et al.*, 2008. Prevalence of *Mycoplasma suis* in slaughter pigs, with correlation of PCR results to hematological findings. *Vet Microbiol.* Jul 4 E pub ahead of print.

3.10) Reproductive Diseases

There were 31 submissions for the diagnosis of abortion, and 16 for other reproductive diseases. There was no significant rise in the latter category over the previous quarter, suggesting that the seasonal summer infertility rise, associated with high ambient temperatures, did not prompt more investigations for infectious diseases this year, and is similar to submissions in this category for the same quarter over the last two years (19 in 2006 and 16 in 2007). There was a rise in abortion submissions over the same quarter in 2006 (20 submissions) and 2007 (23 submissions), which might reflect the availability of better diagnostic tests on aborted fetuses, in particular the PRRS virus PCR. For example, this quarter five stillborn piglets were submitted to investigate sudden onset of early farrowing, with increased incidence of stillbirths and non-viable piglets. PRRS virus was detected by PCR in the spleen of all five piglets examined.

Over the whole quarter, PRRS virus was the most prominent cause of reproductive diseases, associated with six cases. Most of the other submissions resulted in no diagnosis (see DNR section, provisionally 52% of abortion samples and 75% of other reproductive samples yielded no diagnosis).

3.11) Nervous Diseases

No nervous diseases of note besides an outbreak of encephalomyelitis (reported below) were reported.

4) UNUSUAL AND NEW DISEASES

The five-day investigation into unexplained encephalomyelitis continues (for a full report on the clinical and epidemiological aspects see QR2 2008). A PCR using primers based on a sequence of probes from the virus array that had previously lit up with extracts of the tissue from this case was performed. The sequence data of the amplified band, although less than 100 bases, was definitely identified as porcine enterovirus A (PEV A) (formerly known as PEV 8, CPE type II). This result was replicated a further twice. This virus has been associated with reproductive and possibly nervous signs but there is no recent literature.

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.

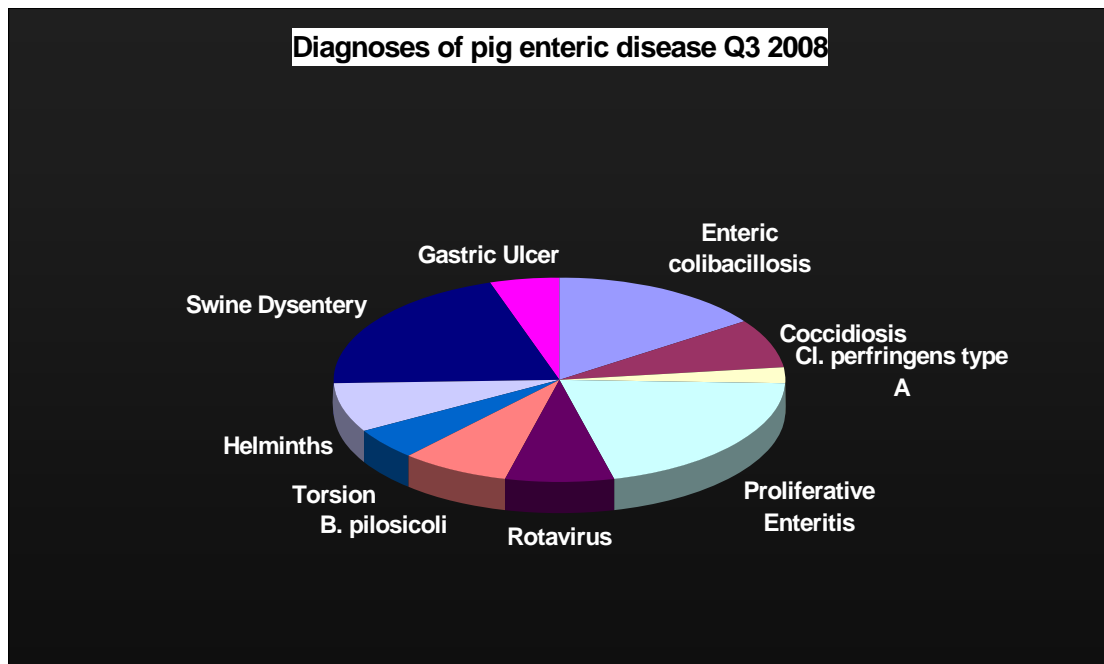
For this report, enteric disease in pigs has been analysed as an example of this type of surveillance.

A wide range of enteric disease was diagnosed this quarter. Swine dysentery and porcine proliferative enteritis (PPE) were the commonest infectious conditions, accounting for 21% of enteric cases where a diagnosis was made.

The profile of swine dysentery is once again rising in the UK and there are industry-led moves to pro-actively manage this resurgence.

Enteric colibacillosis was also prominent (5.4% of all enteric diagnoses).

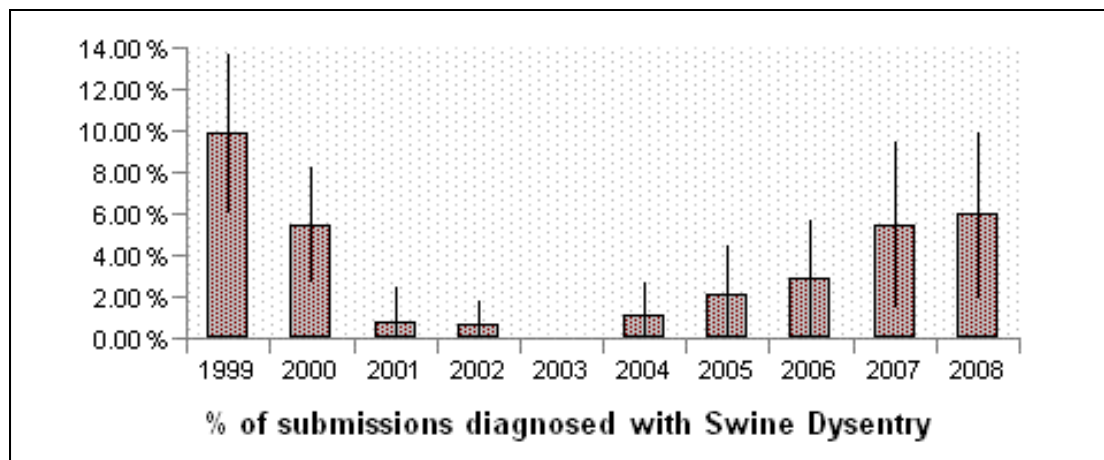
Fig. 12: Frequency of diagnoses of enteric diseases of pigs from diagnosable submissions Q3 2008 (see below for numbers).



5.1) Swine Dysentery (*B. Hyodysenteriae*)

Swine dysentery was diagnosed on eight occasions representing 5.93% of diagnosable submissions. This is the highest proportion in any quarter since 1999. Figure 13 shows the steady increase since 2003. The diagnosis rate of swine dysentery for the last two quarters of 2007 (as a proportion of diagnosable submissions) is also among the highest in recent years.

Figure 13: VIDA Incidence of Swine Dysentery in pigs in Q3 for England and Wales as a percentage of diagnosable submissions compared with the same quarter in previous years



(Vertical bars indicate 95% confidence limits)

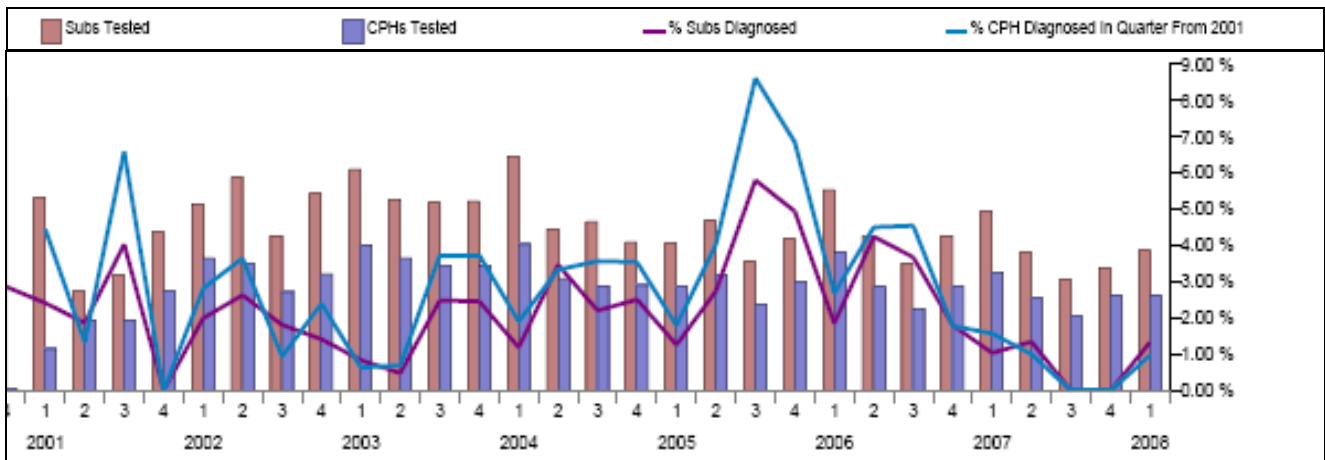
The majority of diagnoses (87.5%) were made by examination of submitted faecal samples but when carcasses were submitted, typical fibrinous/diphtheritic colitis was seen associated with mucoid diarrhoea. Affected growing pigs mostly varied from 12 - 20 weeks of age; one outbreak involved adult sows. The geographic distribution of cases largely reflected the geographic distribution of the UK pig population; 50% of cases were recorded by VLA Bury St. Edmunds, the remainder by Sutton Bonington (12.5%) and Thirsk (37.5%). In all laboratory confirmed cases, *B. hyodysenteriae* was shown to be acting as a sole primary agent.

5.2) *Lawsonia intracellularis* infections

In contrast to the previous quarter when it was noticeable by its absence, porcine proliferative enteritis (PPE) accounted for 18% of the diagnosable submissions. In the majority of cases (57%), diagnosis was confirmed on carcasses, usually by histopathology. Typical presenting signs included malaise, wasting and diarrhoea. Unlike SD, mixed infection with other enteric and non-enteric pathogens was a common complication, including cryptosporidia, *B. pilosicoli*, PRRSv and PCV2.

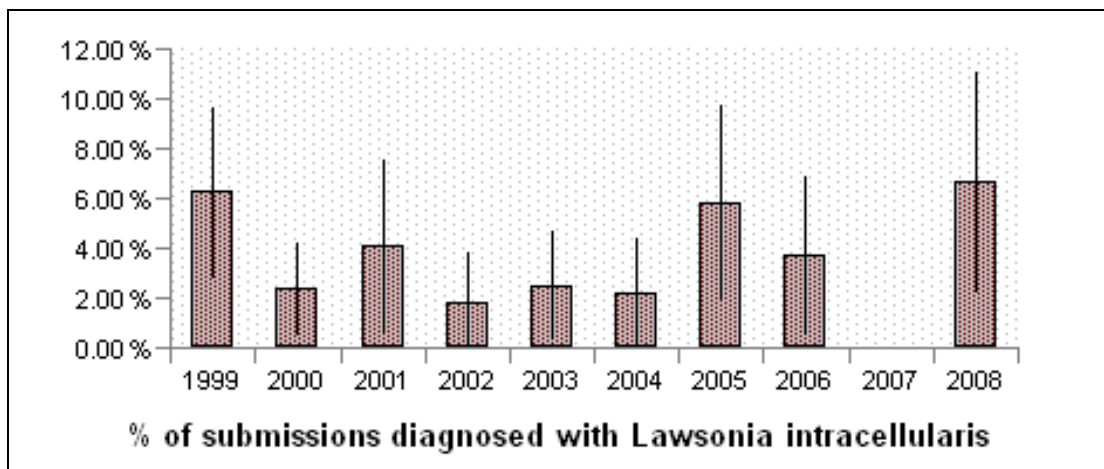
Porcine Haemorrhagic Enteritis (PHE), the more acute clinical syndrome associated with *L. intracellularis* infection was diagnosed on two occasions. One outbreak involved significant mortality in newly stocked replacement gilts which was preceded by several abortions. In the second case, PHE was an unexpected manifestation in a known infected herd in which PPE was historically well recognized. Because of limited farm histories, it could not be ascertained whether any of these herds had been using the attenuated oral *L. intracellularis* vaccine, or prophylactic in-feed antimicrobials.

Figure 14: Seasonal trends in diagnoses of *Lawsonia intracellularis* as a proportion of diagnosable submissions since 2001.



There was an overall trend towards reduced diagnosis rate of PPE/PHE between Q3 2006 and Q1 2008 (fig.3), but the Q3 2008 figures represent a significant increase in incidence compared to this quarter last year (figure 15)

Figure 15: VIDA Incidents of disease due to *Lawsonia intracellularis* in pigs for Q3 2008 as a percentage of diagnosable submissions.



(Vertical bars indicate 95% confidence intervals)

5.3) Enteric colibacillosis

Colibacillosis was diagnosed on six occasions this quarter with an age range of 10-35 days; the majority of cases presented as post weaning scour. Enteropathogenic serotypes identified included O157, O149:K88 (Abbotstown), O147 and O139 (usually associated with bowel oedema outbreaks). In one submission, co-infection with rotavirus contributed to the scour problem. Improved environmental hygiene and minimizing stressful events around weaning are important husbandry measures to control post-weaning colibacillosis.

5.4) Neonatal Enteric Disease

Rotavirus, *Clostridium perfringens* enteritis, coccidiosis.

Infectious enteric diseases in suckler pigs accounted for 20% of diagnoses this quarter. Rotavirus and coccidiosis were the predominant diagnoses.

Isospora suis infection typically presented as pasty cream-coloured scour, dehydration and malaise usually between 3-20 days of age, across all parities. Based on the history of cases submitted to VLA, up to 20% of litters were affected with 70% morbidity. Direct mortality was usually below 5%. Histories submitted indicated that individual dosing with a suitable coccidiostat was effective treatment.

- Earlier *I. suis* infection in the farrowing house may have contributed significantly to a subsequent post-weaning scour problem on a unit investigated by VLA Thirsk. Coccidial oocysts could not be found in faeces of scoured weaners but histopathological examination of intestines demonstrated chronic villus atrophy likely to have reduced digestive and absorptive functions and predisposed to bacterial overgrowth in the colon. Prophylactic dosing of sucklers with decoquinat had previously been successful in preventing clinical coccidiosis but this practice had recently been abandoned. Once reinstated, the post-weaning scour problem was quickly resolved.
- Submission of live acutely scoured untreated piglets from affected litters is essential for histological examination of the gut in *I. suis* cases. Because clinical disease is directly related to the pre-patent stages of *I. suis* life cycle, faecal oocyst counts are often misleadingly low or negative. Visualisation of the protozoan organisms in situ in the intestinal mucosa is key to accurate diagnosis.

Rotavirus infection was identified three times in piglets between 3-10 days of age. Rotavirus is another surface acting enteropathogen causing significant villus atrophy in sucklers and weaners. There is no licenced vaccine for pigs in the UK so control depends on high standards of farrowing house hygiene complemented by the protective effect of lactogenic immunity. It is particularly important that gilts have encountered rotavirus prior to farrowing to ensure adequate transfer to their litters. On one unit, rotavirus, enteropathogenic *E. coli* O149 and *I. suis* were all identified in 10-day-old pigs from the same litter highlighting the multifactorial nature of some scour problems.

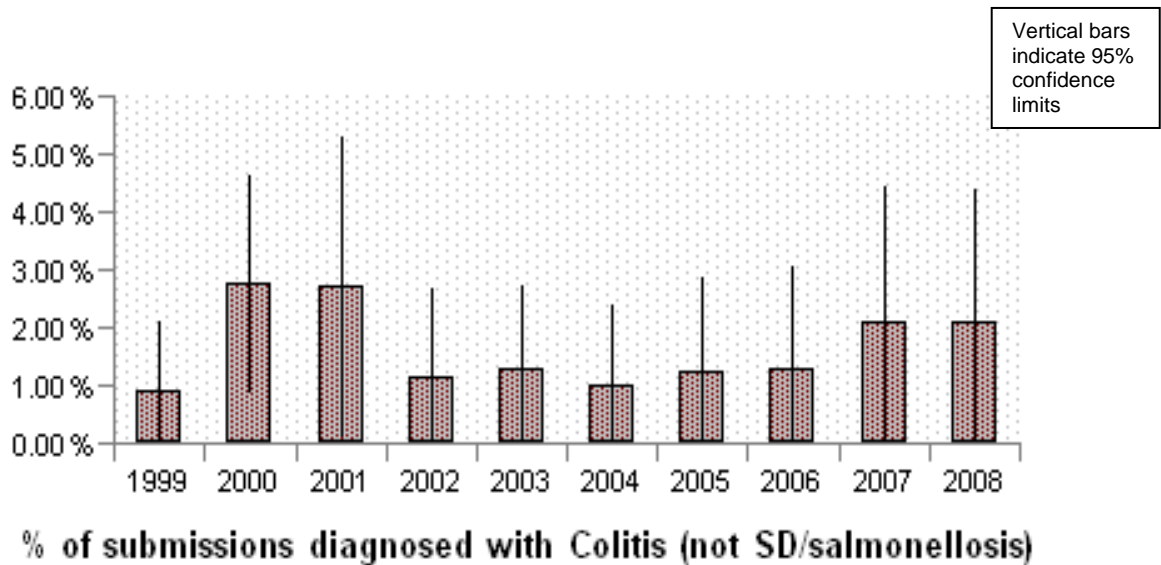
Neonatal enteritis due to *Clostridium perfringens* type A was diagnosed by a combination of typical histological findings and alpha toxin detection by ELISA in gut content. This accurate diagnosis was again only possible by sacrificing a live untreated affected piglet.

5.5) Colitis not due to swine dysentery or salmonellosis

As figure 16 shows, diagnosis rates of colitis not due to salmonellosis or swine dysentery as a proportion of diagnosable submissions have not fluctuated much in the last nine years. *Brachyspira pilosicoli* infection usually accounts for most of these diagnoses, as in this quarter. Because there is some overlap with the less well-defined 'non-specific colitis' category, there may be some under reporting.

PCR (SAC) was used to detect *B. pilosicoli* DNA in faeces from scouring 14-week-old pigs but diagnosis is more usually based on typical histopathological lesions of spirochaetal mucoid colitis, and culture of *B. pilosicoli*.

Figure 16 VIDA Incidents of disease due to Colitis (not associated with *B. hyodysenteriae* or salmonellosis) in pigs for Q3 2008 as a percentage of diagnosable submissions compared with the same quarter in previous years.



5.6) Gastric Ulceration

Fatal gastric ulceration was diagnosed twice this quarter with typical gross necropsy findings and profound anaemia due to blood loss into the gut. Premonitory clinical signs were not observed. In one herd investigated, an established ulcer had eventually perforated causing sudden death of a 15-week-old gilt intended as a herd replacement, on a dedicated gilt rearer site. PCR for PRRSV RNA on post mortem blood from this animal was positive, suggesting active viraemia at the time of death.

5.7) Helminthiasis

Helminthiasis was diagnosed twice in outdoor pigs. In one herd, high faecal worm egg counts were demonstrated together with coccidial oocysts which may have been contributory to ill thrift. In the second herd, large numbers of *Ascaris suum* worms were found in the small intestine and had apparently precipitated fatal intestinal torsion.

5.8) Intestinal Torsion

Complete torsion of the small intestinal mesentery was the cause of death in a well-grown 5 month old pig, one of a small group being reared outdoors and given one large daily feed. Well-recognised risk factors for torsion include competitive feeding, large single intake of highly fermentable concentrate feed and over-boisterous post prandial activity. Altering husbandry practices particularly dividing the daily allowance into several separate feeds are usually effective in reducing the incidence of fatal abdominal catastrophes.

Table 7: Frequency of diagnoses of common enteric disease excluding salmonellosis in QR3 2008

	No. of Cases	% (of GI submissions)
Enteric colibacillosis	6	15.4
Coccidiosis	3	7.7
<i>Cl. perfringens</i> type A	1	2.6
Proliferative Enteritis	8	20.5
Rotavirus	3	7.7
<i>B. pilosicoli</i>	3	7.7
Torsion	2	5.1
Helminths	3	7.7
Swine Dysentery	8	20.5
Gastric Ulcer	2	5.1
Total	39	100.0

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 2003-2007 for VLA only data, and to data for 2007 for GB DNR analysis.

Overall GB DNR rates

- The overall percentage of GB pig diagnostic submissions from VIDA for the first 9 months of 2008 (to third quarter, Q3) where a diagnosis was not reached (DNR) was 16% (122/762). This was not significantly increased from pooled data to Q3 of prior years for which DNR was 16.5%. SAC and VLA data were similar with overall DNR rates of 14.4% and 16.6 % respectively.
- The overall DNR rate for the third quarter of 2008 was not significantly increased from the previous quarter (Q2, 2008) DNR, or from the DNR for equivalent quarters (Q3) in prior years.
- In the first nine months of 2008, there was no overall significant increase in undiagnosed disease for any individual syndrome or presenting sign compared with the same period in prior years. The same is true for DNR rates in Q3 2008 (July to September) only.
- Tables 8 and 9 give GB DNR rates by syndrome and presenting sign to Q3 2008 compared to 2007. Reasons for the higher DNR rate for reproductive syndrome were discussed in the quarterly report for Q2 2008.

VLA pig DNR rates

- Overall the percentage of VLA (England and Wales only) pig diagnostic submissions for the first 9 months of 2008 where a diagnosis was not reached was 16.4% (87/531) which was not significantly different from the DNR for the same period in prior years (pooled data for 2003-2007) of 18.8%. See table 9 for England, Scotland and Wales combined data.
- There was a significant increase in DNR for nervous/sensory syndrome to Q3 2008 compared to prior years, increasing from 5.3% to 18.8% (6/32). Although submission numbers are low, this increase was investigated by reviewing the undiagnosed cases:
 - Two were cases of lymphoplasmacytic encephalitis/encephalomyelitis in 7-8 week old pigs from a unit which has since been the subject of a 5 day investigation detailed elsewhere in this report (now confirmed as porcine enterovirus A).
 - One was suspected water deprivation in outdoor 7-8 week old pigs, although histopathology was not quite typical; no further cases were submitted.
 - One was suspected meningitis in an 11 week old pig. There was gross evidence of pneumonia and meningitis but no bacteria were isolated, probably because the pig had been treated with antibiotics.
- Two cases remain which were undiagnosed :-
 - One 2-3 week-old pig had no histopathological lesions in the brain suggesting that the pig may not have been representative of the farm problem.
 - One was a 25 week-old gilt where the cause of neurological signs was not established, only one gilt was affected.
- There is no evidence of common features in these submissions to suggest the emergence of a new nervous disease.

Table 8: VIDA (GB) Overall Changes in DNR rates for Pigs by Presenting Sign to Q3 for 2008 and prior years same quarter

28/11/2008

1.1a Overall GB Changes in DNR rates for Pig by Presenting Sign to Q3 for 2008 and prior years

Presenting Sign	Overall			Prior years			2008			diff	SE Yr-Yr	z
	DNR	Subs	% DNR	DNR	Subs	% DNR	DNR	Subs	% DNR			
	0	2	0.00 %	0	2	0.00 %	0	0		0.00 %		
ABORTION	41	59	69.49 %	15	25	60.00 %	26	34	76.47 %	16.47 %	12.13 %	1.36
DIARRHOEA	73	328	22.26 %	42	181	23.20 %	31	147	21.09 %	-2.12 %	4.62 %	-0.46
EYE	0	1	0.00 %	0	0		0	1	0.00 %	0.00 %		
FNDDEAD	34	299	11.37 %	20	150	13.33 %	14	149	9.40 %	-3.94 %	3.67 %	-1.07
GIT_XDIARR	3	16	18.75 %	1	8	12.50 %	2	8	25.00 %	12.50 %		
HEALTHY	0	8	0.00 %	0	7	0.00 %	0	1	0.00 %	0.00 %		
ILL_THRIFT	5	24	20.83 %	3	13	23.08 %	2	11	18.18 %	-4.90 %		
LAME	4	46	8.70 %	2	18	11.11 %	2	28	7.14 %	-3.97 %	8.51 %	-0.47
MALAISE	8	70	11.43 %	5	39	12.82 %	3	31	9.68 %	-3.14 %	7.66 %	-0.41
MASTCLIN	0	4	0.00 %	0	1	0.00 %	0	3	0.00 %	0.00 %		
MILKDROP	0	1	0.00 %	0	1	0.00 %	0	0		0.00 %		
MUSC_SKEL	2	10	20.00 %	2	7	28.57 %	0	3	0.00 %	-28.57 %		
NERVOUS	7	49	14.29 %	4	28	14.29 %	3	21	14.29 %	0.00 %	10.10 %	0.00
OTHER	19	161	11.80 %	6	79	7.59 %	13	82	15.85 %	8.26 %	5.09 %	1.62
RECUMBT	3	22	13.64 %	1	11	9.09 %	2	11	18.18 %	9.09 %		
REPRO	11	21	52.38 %	3	5	60.00 %	8	16	50.00 %	-10.00 %		
RESPIR	14	173	8.09 %	8	91	8.79 %	6	82	7.32 %	-1.47 %	4.15 %	-0.35
SKIN	5	39	12.82 %	3	19	15.79 %	2	20	10.00 %	-5.79 %		
UNKNOWN	19	125	15.20 %	13	67	19.40 %	6	58	10.34 %	-9.06 %	6.44 %	-1.41
URINARY	0	1	0.00 %	0	1	0.00 %	0	0		0.00 %		
WASTING	9	120	7.50 %	7	64	10.94 %	2	56	3.57 %	-7.37 %	4.82 %	-1.53
	257	1,579	16.28 %	135	817	16.52 %	122	762	16.0 %	-0.51 %	1.86 %	-0.28

Table 9: VIDA (GB) Overall Changes in DNR rates for Pigs by Syndrome to Q3 for 2008 and prior years

GB Syndrome	Overall			Prior years (2007 only)			2008		
	DNR	Subs	% DNR	DNR	Subs	% DNR	DNR	Subs	% DNR
Circulatory	2	35	5.71 %	2	21	9.52 %	0	14	0.00 %
Enteric	96	522	18.39 %	48	276	17.39 %	48	246	19.51 %
Mastitis	0	4	0.00 %	0	1	0.00 %	0	3	0.00 %
Musculo-skeletal	5	64	7.81 %	3	29	10.34 %	2	35	5.71 %
Nervous / Sensory	9	84	10.71 %	3	42	7.14 %	6	42	14.29 %
Reproductive	57	82	69.51 %	20	33	60.61 %	37	49	75.51 %
Respiratory	15	321	4.67 %	10	154	6.49 %	5	167	2.99 %
Skin	5	45	11.11 %	4	22	18.18 %	1	23	4.35 %
Systemic & Misc	43	564	7.62 %	29	290	10.00 %	14	274	5.11 %
Unknown (999,990,991,980,970)	25	30	83.33 %	16	19	84.21 %	9	11	81.82 %
Urinary	0	16	0.00 %	0	8	0.00 %	0	8	0.00 %

The green highlighting of 'systemic and miscellaneous' indicates a significant reduction in DNR for this syndrome compared to prior years.