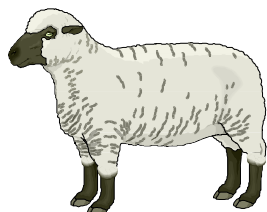


GB surveillance

Small ruminant diseases

Quarterly Report: Volume 12 No. 3

Date: July – September 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 Aberdeen, Edinburgh, Inverness, St Boswells and Thurso Disease Surveillance Centres which comply with ISO 17025 standard.

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Highlights

- **Increase in diagnostic sheep and goat submissions compared with the third quarter of 2007**
 - Total diagnostic sheep submissions increased by 20% and diagnostic goat submissions by 30%. Improved economics in the industries could account for this (page 4)
- **Parasitic gastroenteritis including haemonchosis and acute and chronic fasciolosis were commonly diagnosed**
 - The weather during the year has continued to provide conditions that predispose to endoparasitism (pages 7-10)
- **Syndromic analysis of alimentary tract disease in post weaned lambs**
 - An analysis of this syndrome is provided in the report (page 14)
- **Two incidents of maedi-visna**
 - This condition was last recorded on VIDA in 2005 (page 11)
- **Macrocytic lactone anthelmintic resistance confirmed in one flock**
 - VLA and SAC laboratories continue to identify anthelmintic resistance to benzimidazoles, levamisole and less commonly macrocytic lactones (page 7)

OVERVIEW

Weather and climate

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.

The mild and generally wet weather provided conditions which favoured both parasitic gastroenteritis and fascioliasis (see endemic disease surveillance).

Economics of the small ruminant industries

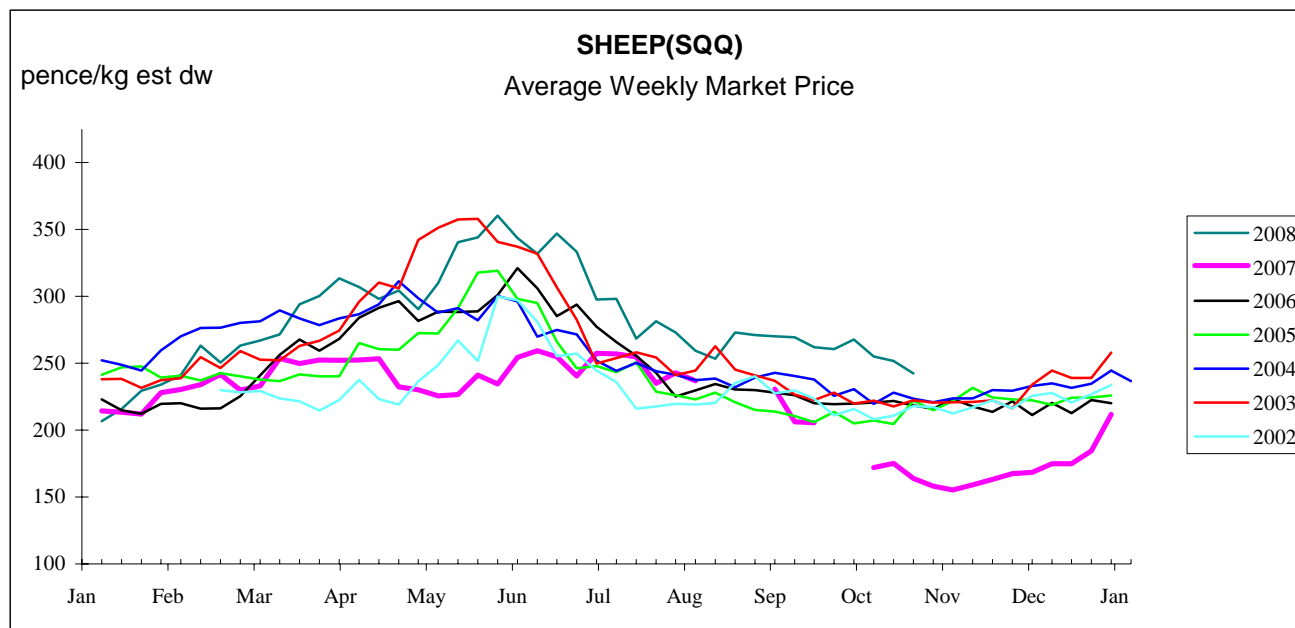
No comparison could be made to 2007 lamb prices during periods in August and September, as in those weeks in 2007 no lambs were marketed because of the foot and mouth disease outbreaks. Lamb prices were, however, generally significantly higher than the equivalent period in 2007 when prices were particularly depressed (Figure 1, Table 1). This has continued the trend seen in the last two quarters. Following its peak in May, the deadweight price for new season lambs has followed the typical overall downward trend as supplies to the market have increased.

Defra's monthly Farming and Food Brief provides a general overview of the latest Agricultural and Economic Statistics news in relation to the UK's farming and food industries:

<https://statistics.defra.gov.uk/esg/publications/monthly%20brief/default.asp>

UK lamb exports increased by an encouraging 7% in tonnage and 20% in value in the first six months of 2008 as the industry profited from both the weakness of sterling and a boost to marketing support in Europe.

However, against a background of the continuing decline in lamb consumption in many European markets and growing pressures on consumers from the economic slowdown, EBLEX recommends that the whole industry needs to work together to ensure the right type of lean, well-conformed lambs and effective marketing if it is to maintain the momentum of this year's improvements. This is especially important with exports accounting for around 30% of UK production and being particularly vital to market stability during the annual early winter peak of supplies. (Contact www.eblex.org.uk).

Figure 1: Average weekly market price (pence/kg estimated deadweight) 2002-2008**Table1: Prices for estimated deadweight lambs, June to September 2008**

DATE (2008)	P/KG EST DW	% CHANGE FROM 2007
28 Jun	297.7	+ 15.7
05 Jul	298.1	+ 16.0
12 Jul	268.5	+ 5.4
19 Jul	281.5	+ 19.8
26 Jul	273.0	+ 12.4
02 Aug	259.3	+ 9.5
09 Aug	253.4	-
16 Aug	273.0	-
23 Aug	271.0	-
30 Aug	270.2	+ 17.1
06 Sep	269.5	+ 30.6
13 Sep	262.1	+ 27.5
20 Sep	260.6	-
27 Sep	267.7	-
04 Oct	255.0	+ 48.2

(<http://statistics.defra.gov.uk/esg/datasets/wplivest.xls>)

Submissions for scanning surveillance

The number of sheep diagnostic submissions increased by 20% compared with the equivalent quarter in 2007 and the number of diagnostic sheep carcase submissions increased by 28% (table 2). Diagnostic goat submissions increased by 30% and diagnostic goat carcase submissions showed a more moderate increase of 12% (table 3). The distribution of diagnostic submissions by region and purpose is shown in figures 2 and 3. The increase in submissions is likely to be associated with the improved trading conditions in 2008 compared with 2007, when there were poor returns notably in the sheep sector associated with restrictions to control FMD and bluetongue.

Table 2: Sheep Diagnostic Submissions in GB

Jul - Sept Quarter	Submissions			Carcasses		
	E&W	Scotland	Total	E&W	Scotland	Total
2008	1,350	611	1,961	477	237	714
2007	1,045	596	1,641	416	142	558
2006	993	681	1,674	428	207	635
2005	1,107	622	1,729	417	195	612
2004	1,255	697	1,952	433	279	712

Table 3: Goat Diagnostic Submissions in GB

Jul - Sept Quarter	Submissions			Carcasses		
	E&W	Scotland	Total	E&W	Scotland	Total
2008	207	22	229	53	3	56
2007	162	12	174	48	0	48
2006	136	48	184	21	5	26
2005	149	27	176	40	5	45
2004	172	21	193	36	2	38

Figure 2: Sheep diagnostic submissions by region and purpose

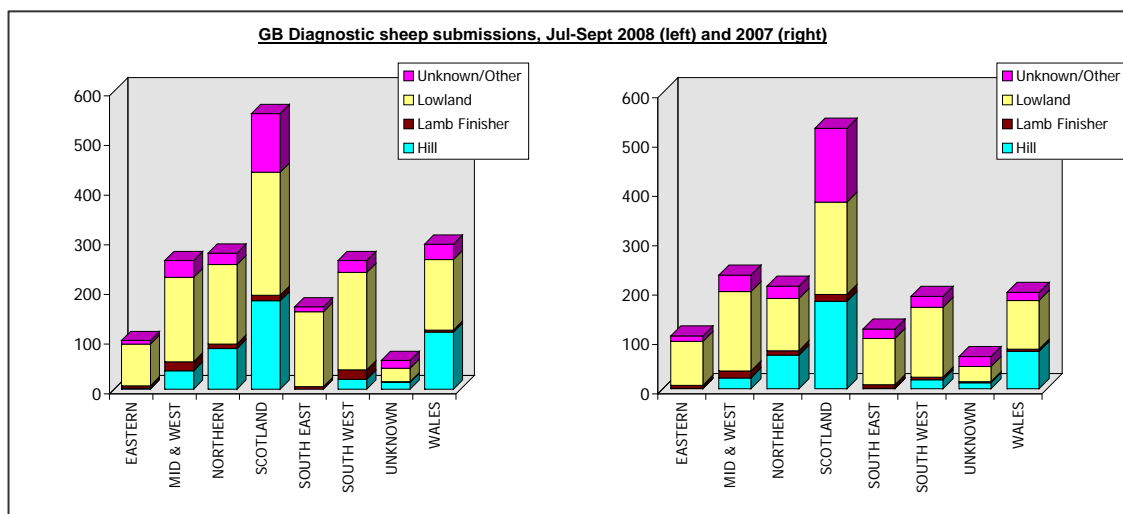
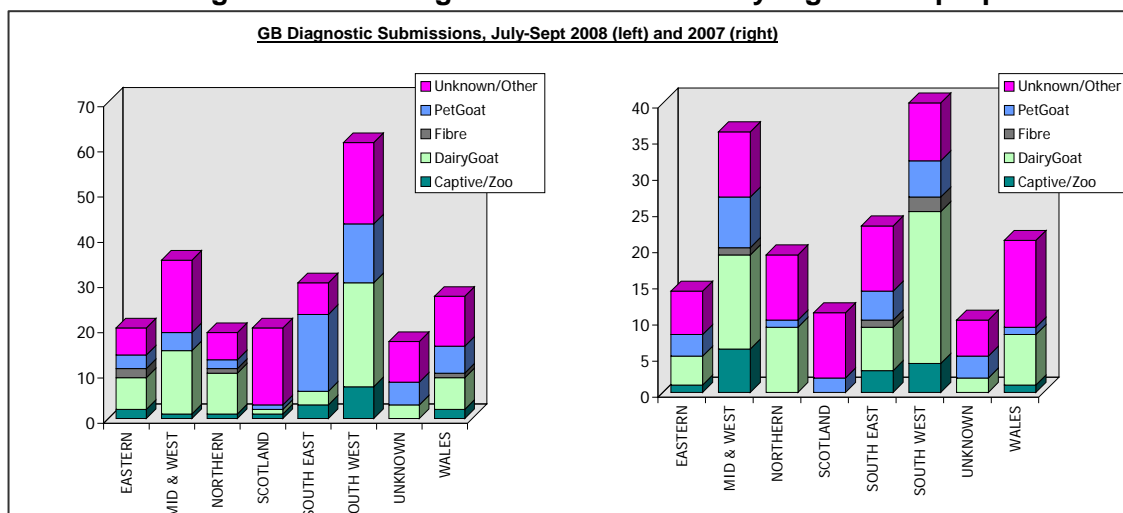


Figure 3: Goat diagnostic submissions by region and purpose



Notifiable Disease Reported

No notifiable disease incidents were identified during the quarter. On two occasions, Animal Health was notified and subsequent testing ruled out bluetongue following initial suspicion of the disease in lambs and a goat respectively.

Brucella melitensis

Few sheep abortion submissions are received during the third quarter due to the seasonal nature of sheep breeding. Ten abortion submissions were examined and *Brucella melitensis* was not isolated from any sample.

Investigatory and Advisory Farm Visits

VLA and SAC veterinarians visit farms at the request of private veterinary surgeons, to assist with the investigation of unusual, severe or difficult disease incidents. VLA veterinarians also visit for statutory purposes (for example, under the Zoonoses Order to investigate outbreaks of salmonellosis). From the second quarter of 2007, the VLA and SAC VS harmonised the way in which these more detailed investigations involving visits to farms were recorded. This is why comparable data is not available for previous years.

Table 4: Farm Investigation and Advisory Visits

Jul - Sept Quarter	E&W	S	Total Visits
2008	10	4	14
2007	5	3	8
2006	8	NA	NA
2005	15	NA	NA
2004	13	NA	NA

Potential Food Safety Incidents

Table 5: Potential Food Safety Incidents

Jul - Sept Quarter	Total Incidents	Botulism	Lead	Copper	Other
2008	1	0	0	1	0
2007	6	1	1	1	3
2006	4	1	0	1	2
2005	6	1	1	4	0
2004	3	0	1	2	0

ENDEMIC DISEASE SURVEILLANCE

A note about the disease trends charts.

This section of the report gives information on occurrence of selected diseases. The data originate from submissions and are summarised and presented according to the diagnosis reached and assigned as a VIDA code. Our charts show the number of diagnoses (numerator) as a proportion of the number of submissions in which that diagnosis was possible (denominator), for all of GB, England & Wales and for Scotland. The bars indicate the 95% confidence limits. Note that the y-axis scale of the charts varies and therefore care must be taken when comparing individual charts.

SYSTEMIC AND MISCELLANEOUS DISEASES

Salmonellosis

Provisional data for diagnostic submissions indicate that a diagnosis of salmonellosis was recorded in nine* ovine submissions (0.4% of diagnostic submissions), eight to VLA (0.5%) and one to SAC (0.2%), in the third quarter of 2008. Clinical signs were malaise, diarrhoea and wasting. In the equivalent period in 2007, salmonellosis was also recorded in nine submissions (0.5%), seven to VLA and two to SAC. Serotypes, where determined, in ovine salmonellosis incidents are shown in Table 6. Salmonellosis was not recorded in goats in Q3 in 2008 or 2007.

Table 6: Serotypes in ovine salmonellosis incidents Q3 2004 to 2008

Serotype or group	2004	2005	2006	2007	2008
S. diarizonae	6	7	6	4	7
S. Agama	1	0	3	0	0
S. Anatum	1	0	0	0	0
Group B	0	0	1	0	0
S. Derby	0	0	1	0	0
S. Dublin	1	4	0	2	1
S. Enteritidis	0	0	1	0	0
S. Indiana	1	0	0	0	0
S. Montevideo	0	0	0	0	1
S. Newport	0	1	0	0	0
S. Stourbridge	0	0	1	0	0
S. Typhimurium	2	1	3	1	1
Not determined	0	0	0	2	0
Total serotypes *	12	13	16	9	10

* More than one serotype was isolated from some submissions

The percentage of appropriately tested submissions from which disease due to Salmonella was diagnosed is shown in Figure 4.

On this basis:-

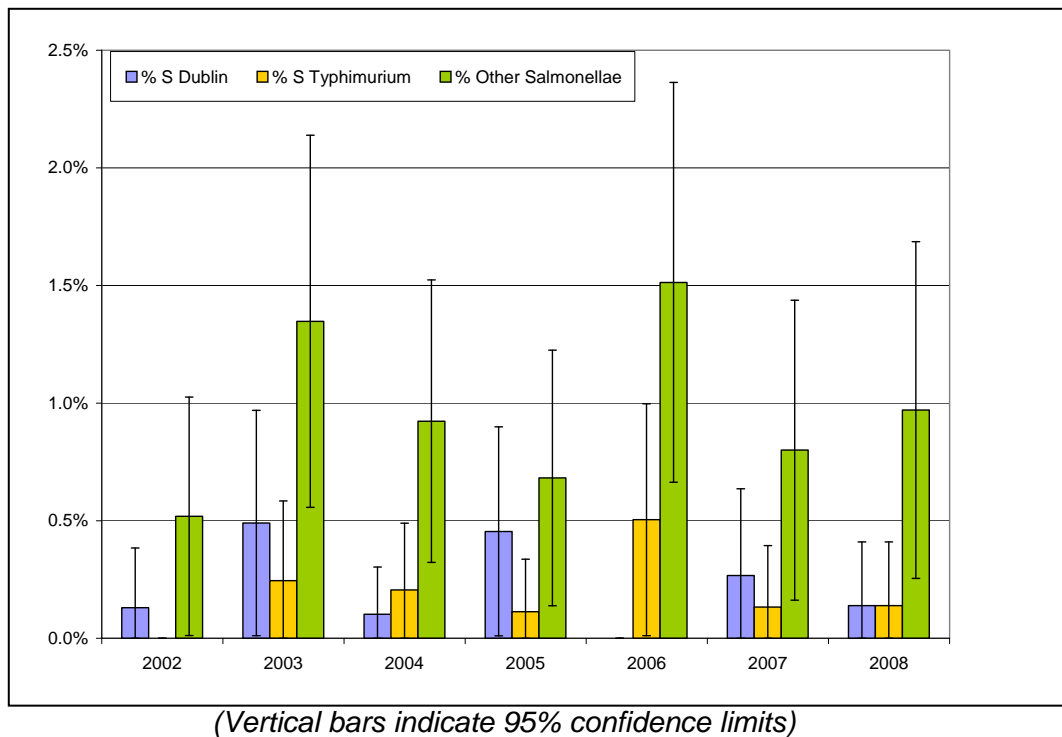
- Diagnoses of S. Dublin were lower than in 2007
- Diagnoses of S. Typhimurium were at a similar level to 2007.
- Diagnoses of other serotypes were higher than in 2007, although lower than in 2006. *Salmonella diarizonae* serotype 61:k:1,5,7 and variants was most frequently isolated. This may be sheep adapted and is very rarely reported as causing human illness.

These year on year variations must be interpreted with caution as both numbers of submissions tested for Salmonellae and numbers of diagnoses of salmonellosis are usually low in the third quarter. Clinical salmonellosis is most often reported at times of stress such as late gestation, parturition and early lactation. In this quarter, sheep are likely to be at grass and therefore to be exposed to lower concentrations of the organism than when housed. Some serotypes are associated with abortions and therefore reported much less frequently during periods when few ewes are pregnant.

Early Detection System (EDS)

EDS for salmonellosis uses historic data in an algorithm to derive expected and threshold values. An exceedance score indicates the degree to which the current count exceeds the threshold; a value of >1 indicates a significant increase in reported incidents, which may indicate a potential outbreak.

There was no indication of significant increases in reporting Q3 2008 using either the five or 12 year baseline.

Figure 4: VIDA Incidents of Salmonellosis in Sheep (as percentage of diagnosable submissions) in Q3 2002-2008

Drenching gun injuries are a sporadic diagnosis and linked to poor drenching technique or poorly maintained equipment. It was diagnosed in 11 submissions in GB for this quarter (nine times in 3rd quarter 2007). Despite the initial injury being traumatic in nature, there is usually a considerable time lapse before clinical signs or mortalities are recorded. As examples, three cases reported in monthly reports for this quarter had time intervals of 14, 12 and seven days respectively before clinical signs were seen. In all three cases there was evidence of secondary infection which is then the most likely cause of the reported severe clinical signs and death. In one of these cases eight from a group of 102 lambs had difficulty eating and were losing weight, and two had died. It is positive to note that the diagnostic rate of this condition remains low, despite favourable weather conditions for endoparasitism during the quarter which must have necessitated the dosing of large numbers of livestock.

ALIMENTARY TRACT DISEASES

(See also syndromic disease analysis – alimentary tract disease in post-weaned lambs).

Parasitic gastro-enteritis (PGE)

PGE was diagnosed in 439 incidents in GB in sheep (33.5% of diagnosable submissions) in the third quarter of 2008 (figure 5). This is the highest number of incidents of PGE in this quarter since the start of the current recording system in 2002. There was an increase in the number of cases in England and Wales, from the previous year, and a slight decrease in Scotland. The weather was wetter than average in England and Wales throughout this quarter, and in July and August in Scotland, which is likely to have been a significant factor in disease. Disease was predominantly recorded in lambs.

There were ten cases of benzimidazole resistance, four of levamisole resistance and one of macrocyclic lactone resistance reported by VLA and SAC this quarter. The resistance to macrocyclic lactone anthelmintics was detected in a lowland flock after a veterinary supervised faecal egg count reduction test. There was a reduction in egg count of only 89.8%. *Ostertagia/Teladorsagia* spp were identified as the resistant species. The farm had reported suspicions of resistance last year. The anthelmintic levamisole appeared to be effective on this farm. Anthelmintic resistance will also be a contributory factor to the number of incidents of PGE, as there is a reduction in the number of drugs available to

control disease on some farms. The numbers recorded by VLA and SAC are likely to be an underestimate of the cases of anthelmintic resistance.

Figure 5: Incidents of parasitic gastroenteritis as a percentage of diagnosable submissions

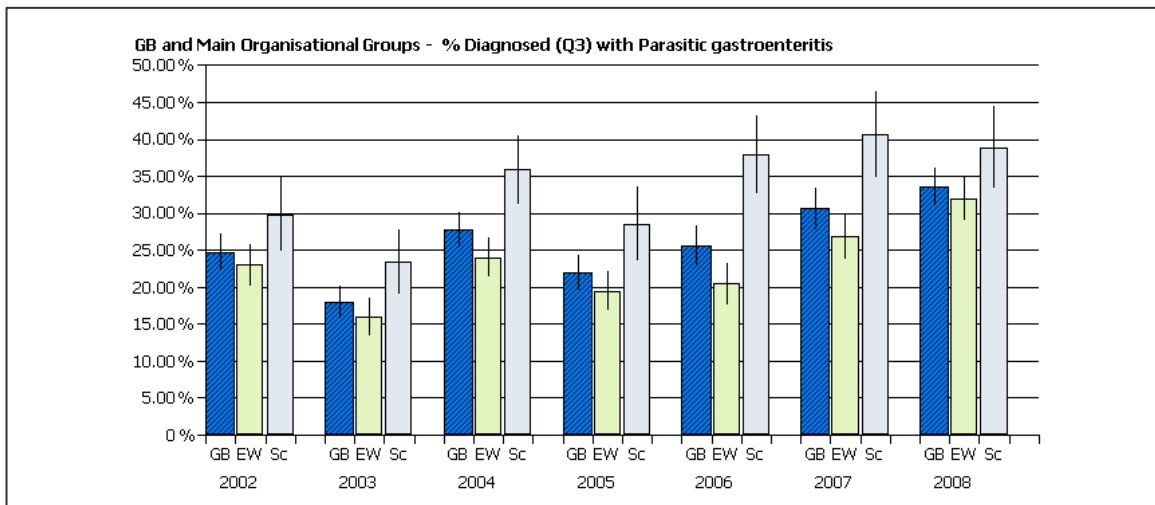
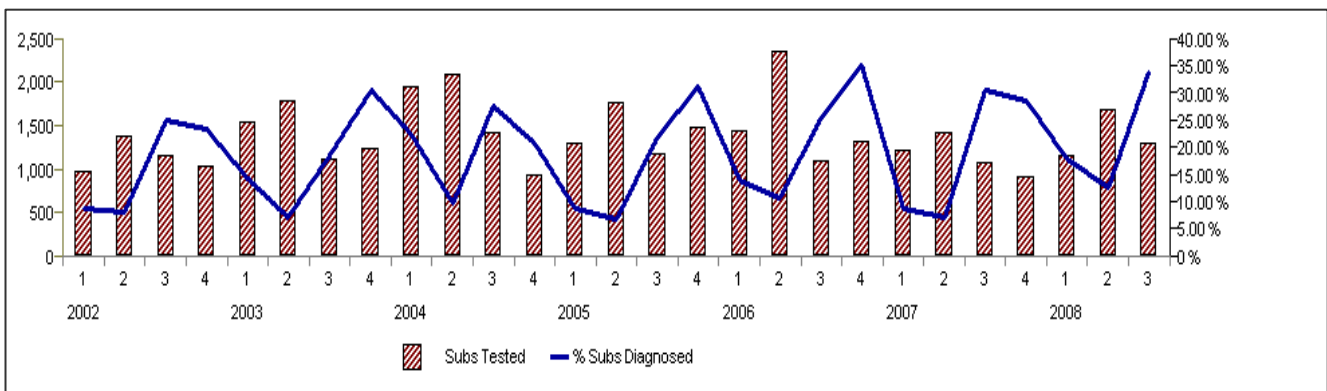


Figure 6, shows that the peak of diagnoses of PGE is in the later half of the year. Incidents peaked in the third quarter last year, and this is likely this year, as the summer weather has ensured exposure to gastro-intestinal parasites, and host immunity should be developing in the last quarter. During years with a dry summer, incidents tend to peak in the last quarter. With the onset of wetter weather in the autumn, disease occurs in lambs that have had limited exposure to parasites during the drier summer.

Figure 6: Incidents of PGE in GB (as a percentage of diagnosable submissions) 2002 to date



PGE- haemonchosis

Thirty-three incidents of disease caused by *Haemonchus contortus* were recorded by VLA and one incident by SAC VS. Incidents were recorded more commonly in the south of England, but there were also cases in the north west of England. Disease occurred in both adult sheep and lambs. The number of incidents as a percentage of diagnosable submissions is shown in figure 7.

The peak of diagnoses of haemonchosis occurs in the third quarter of the year as seen in figure 8. Disease was not recorded as commonly in this quarter in 2008 as was the case in 2007, which was notable for the large number of incidents.

Figure 7: Incidents of PGE - haemonchosis in GB (as a percentage of diagnosable submissions) 2002 to date

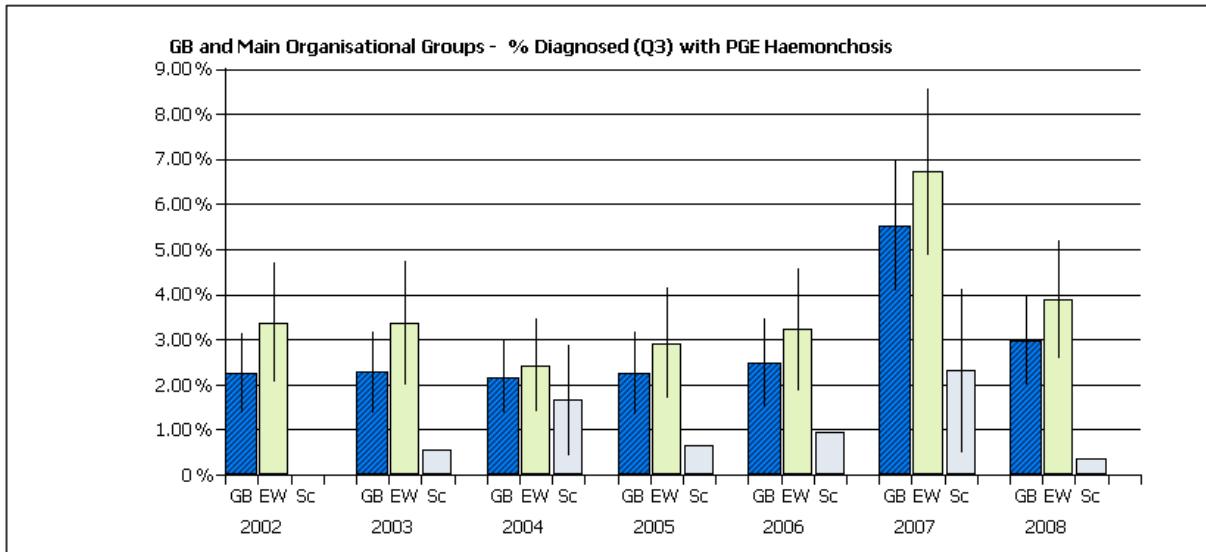
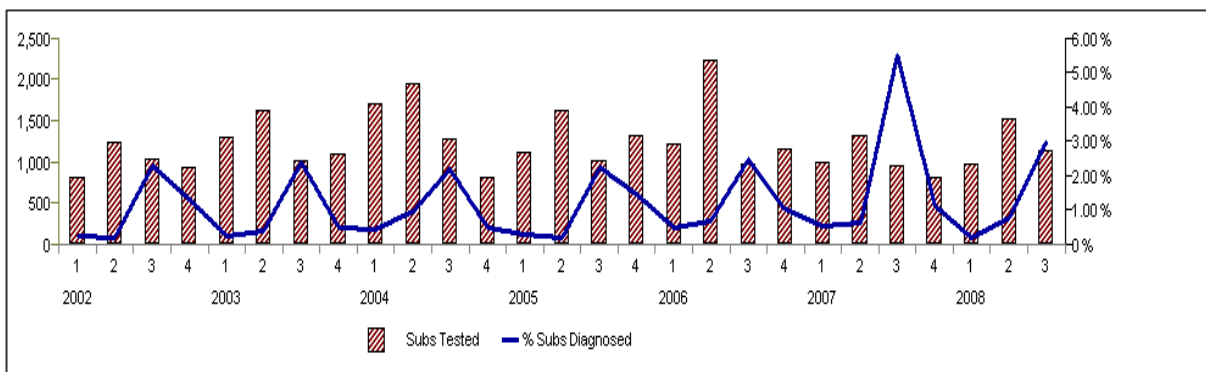


Figure 8: Incidents of PGE - haemonchosis in GB (as a percentage of diagnosable submissions) 2002 to date



Nematodirosis

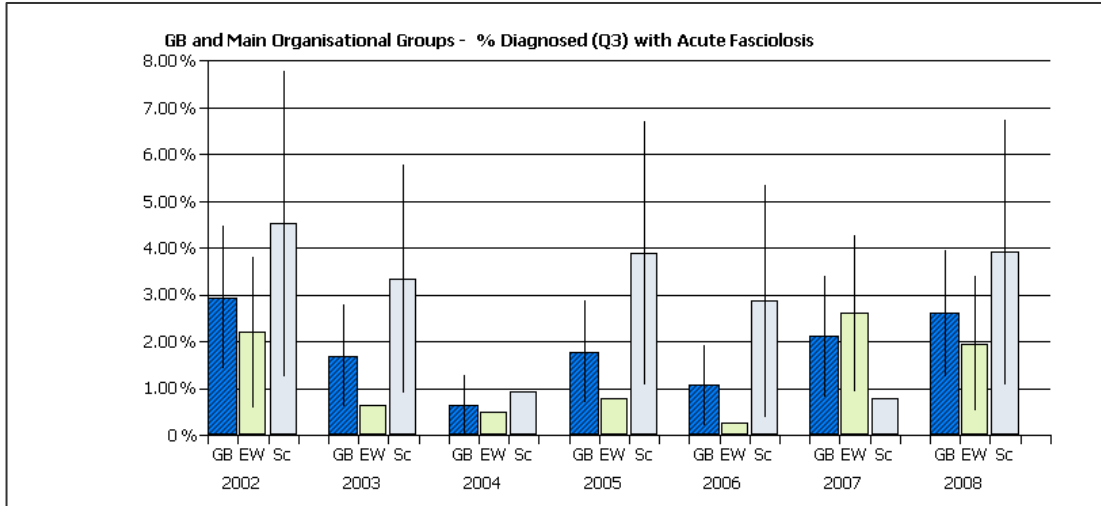
Due to the temperature dependent nature of nematodirosis, diagnoses in lambs from parts of Scotland may be recorded later in the year compared to flocks in England and Wales. A total of 36 incidents of nematodirosis were recorded by SAC in the 3rd quarter, bringing the total for the year to 136. This compared to 69 incidents diagnosed in Scotland during the whole of 2007.

Acute fasciolosis

There were 14 cases of acute fasciolosis diagnosed by VLA and SAC in this quarter of 2008. In one typical incident disease was confirmed in two animals aged less than 12 months submitted following an increased mortality in store lambs and replacement yearling ewes on a farm. Necropsy findings were typical of acute fasciolosis with a large amount of unclotted blood in the abdominal cavity and enlarged, rounded livers with haemorrhagic tracts beneath the capsule and a diffuse fibrinous exudate on the capsule itself. Interestingly, liver flukes were also found in the gall bladders of both animals. Incidents of disease as a percentage of diagnosable submissions are shown in figure 9.

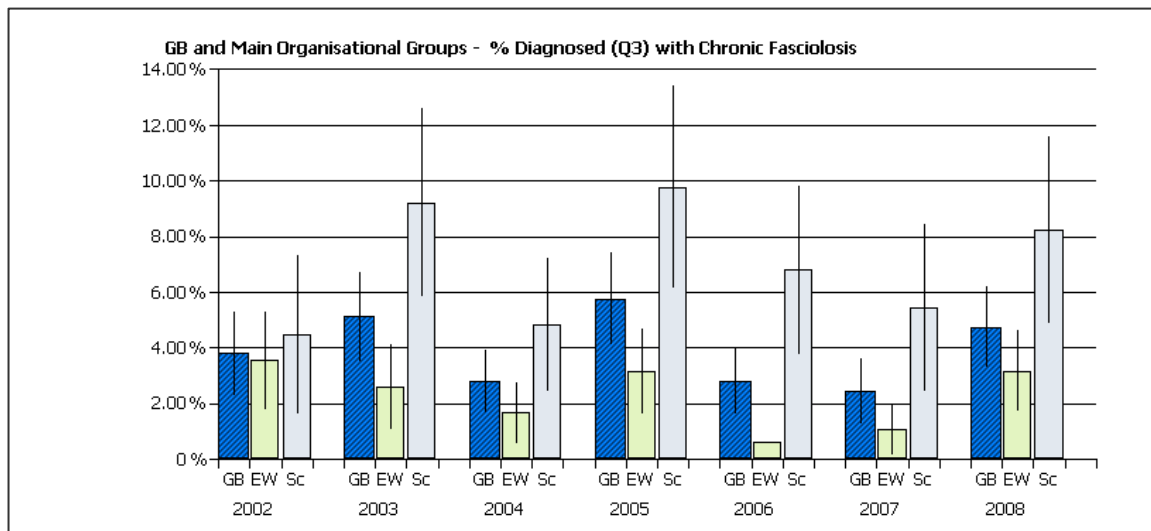
Black disease, a possible sequel to acute fasciolosis, is occasionally diagnosed by VLA and SAC VS. One incident involved a 14-month-old Balwen ewe, in July, which was the only one to have died in a flock of 35 lowland sheep. The group had been given a fluke and worm drench six weeks earlier, but had received no clostridial vaccinations. Necropsy revealed a 0.5cm diameter area of pale necrosis at the edge of the liver, and an adult liver fluke in the gall bladder. The presence of *Clostridium novyi* was demonstrated by fluorescent antibody tests on the liver.

Figure 9: Incidents of acute fasciolosis in GB (as a percentage of diagnosable submissions) 2002 to date



Chronic fasciolosis

Figure 10: Incidents of chronic fasciolosis in GB (as a percentage of diagnosable submissions) 2002 to date



Thirty-nine incidents of chronic fasciolosis were diagnosed in GB by VLA and SAC VS during the quarter. This represents an increase as a percentage of diagnosable submissions compared with the equivalent period of 2007 (figure 10). Concurrent PGE and fasciolosis were diagnosed by the examination of four faeces samples submitted from a flock of 160 seven-month-old Welsh Mountain lambs. 10% of the group were showing clinical signs of diarrhoea and weight loss and two lambs had died. High faecal worm egg counts were demonstrated in all four samples with the highest count being 18,000 *Trichostrongyle* type eggs per gram. *Fasciola hepatica* eggs were seen in a pooled faeces sample indicating that the possibility of patent liver fluke infestations should be considered in lambs of this age.

Unusual alimentary tract condition:

Abomasal emptying defect (AED) is an uncommon condition and was diagnosed on two occasions. One incident involved a 15-month-old Texel ram submitted for investigation of weight loss over several months. The rumen was very small and the abomasum was grossly enlarged, occupying most of the abdominal cavity. Its content was very dry. No predisposing cause for abomasal impaction was identified and scrapie was ruled out histopathologically, so AED was suspected. This condition has most often been reported in the Suffolk breed but there are some reports of cases in Texels. The second incident occurred in a three-and-a-half-year-old Suffolk ewe, after being found dead following dyspnoea and a nasal discharge of large amounts of rumen-like fluid. At postmortem examination the abomasum was shown to be grossly distended with large amounts of dry tan fibrous contents. No gross evidence of pyloric obstruction was identified and the features were also consistent with AED.

RESPIRATORY DISEASES

Maedi-visna

Clinical maedi-visna is an uncommon diagnosis in GB, although serological breakdowns are recorded periodically in testing for the MV Accreditation Scheme. The disease, which was last recorded on VIDA in 2005, was reported on two occasions this quarter. In one incident, positive serology was obtained in the agar gel immunodiffusion test (AGIDT) in a sample submitted from a ewe with non-treatment responsive respiratory disease with dyspnoea over 5-6 months. There was one clinically affected ewe in a group of 50. In a second case a mule ewe found dead on a Scottish Borders holding was submitted for necropsy. The entire left lung was found to be grey and consolidated, with similar but more limited changes noted in the right lung. Although a diagnosis of ovine pulmonary adenocarcinoma was confirmed on histopathology, the ewe was shown to be seropositive to maedi-visna. When a further ewes from the same flock were blood sampled as random a total of 14 were also found to be positive for antibody, suggesting that infection within the flock was widespread.

Other respiratory diseases

The number of incidents of pneumonia associated with *Mannheimia* species decreased as a percentage of diagnosable submissions, although this was not statistically significant as a percentage of diagnosable submissions. No other notable trends were identified during the quarter.

URINARY DISEASES

No significant incidents were identified during the quarter.

BLOOD, LYMPH AND CIRCULATORY DISEASES

Twenty four incidents of caseous lymphadenitis (*Corynebacterium pseudotuberculosis*) were diagnosed in GB during the quarter. This does not represent a significant change compared with the third quarter of 2007.

SKIN DISEASES

Sheep scab

There were no significant changes in the frequency of diagnosis of sheep scab.

Pediculosis (Louse infestation)

The upward trend in the number of diagnoses of lice across GB noted in the previous quarterly report continued into the third quarter, but the number of diagnoses are low. The diagnosis of lice infestation

has a marked seasonal distribution, with the majority of diagnoses made in the winter months. Scotland has seen a marked increase in the number of diagnoses of lice infection in 2008, with England and Wales similar to 2007 levels.

Ticks and tick-related diseases

The number of diagnoses of tick-related disease was low, and showed no significant change on 2007 figures.

Other skin diseases

Several severe cases of dermatophilosis and other secondary skin infections were seen in lambs in association with other common endemic diseases, notably PGE and cobalt deficiency. Immune suppression and wet weather are important predisposing factors for flock outbreaks of bacterial skin disease, notably dermatophilosis.

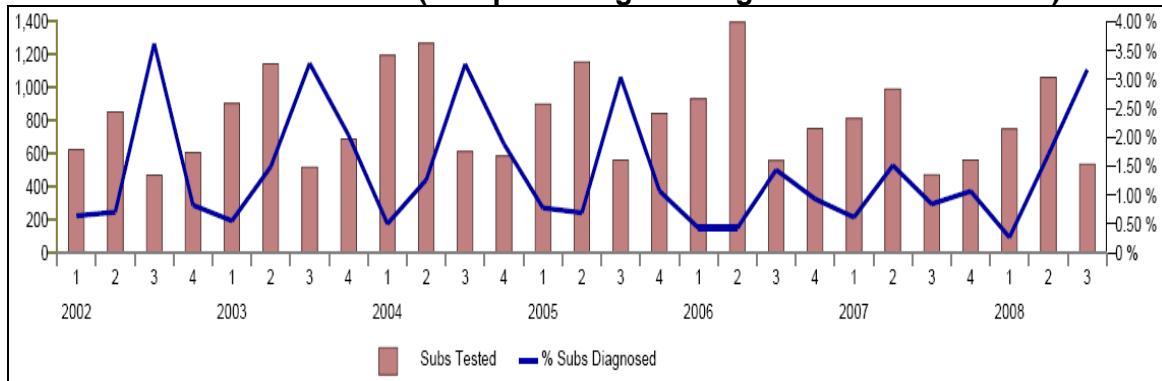
MUSCULO-SKELETAL DISEASES

There were few diagnoses made during the quarter and no incidents of note investigated.

NERVOUS DISEASES

Cerebro-cortical necrosis (CCN) was the commonest diagnosis made during the quarter with 17 (8 SAC, 9 VLA) incidents recorded. Most diagnoses are made in lambs of between 6 and 9 months of age and this is reflected in the seasonal peak of diagnoses of this condition during the third quarter (figure 11):

Figure 11: Incidents of CCN in GB (as a percentage of diagnosable submissions) 2002 to date

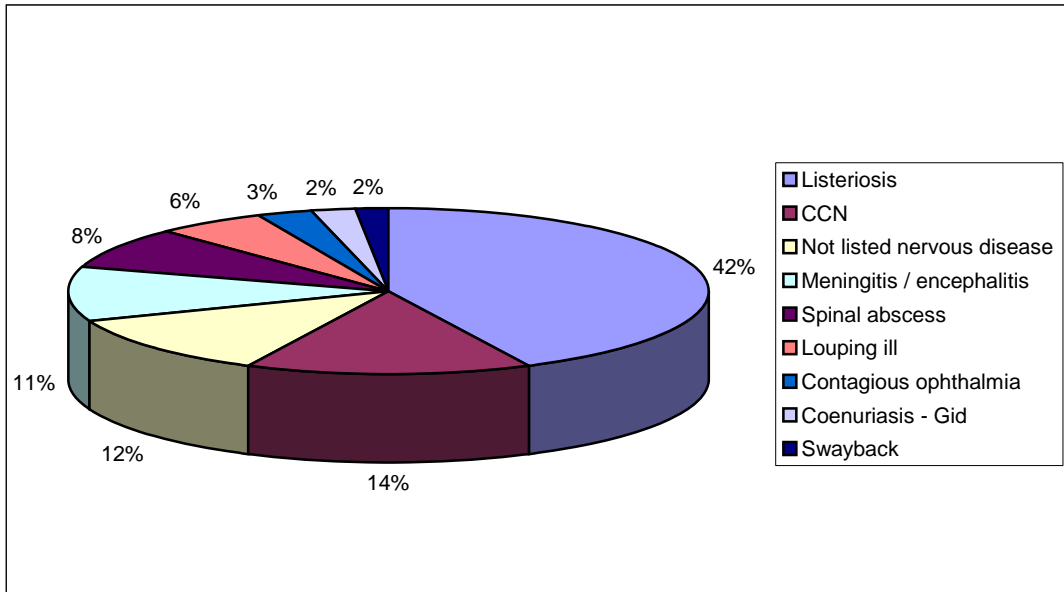


Listerial encephalitis was the second most frequent diagnosis with 13 (6 SAC, 7 VLA) incidents diagnosed. Listeriosis is the commonest nervous disease diagnosis for the year to date (table 7, figure 12).

Table 7: Nervous disease diagnoses in sheep Jan – Sept 2008 (GB)

Condition	No. diagnoses
Listeriosis	76
CCN	26
Not listed nervous disease	21
Meningitis / encephalitis	19
Spinal abscess	14
Louping ill	10
Contagious ophthalmia	5
Coenuriasis (Gid)	4
Swayback	3

Figure 12: Nervous disease diagnoses in sheep - Jan -Sept 2008 (GB)



REPRODUCTIVE DISEASES

Few submissions are received for abortion investigation during the third quarter of the year due to the seasonal nature of the sheep industry. Two incidents of toxoplasmosis and a single incident of enzootic abortion (*Chlamydomphila abortus*) were diagnosed.

GOAT DISEASES

The number of goat submissions received this quarter (n = 200) was the highest third quarter total for the past ten years (mean – 156). With the exception of PGE (see below) there were no obvious trends identified.

TB in Golden Guernsey Goats Update - Information from Animal Health is that all tracings from the herd of origin in Wales have now been completed. A total of ten herds have been confirmed with visible lesions at postmortem examination, six in Wales and four in England. Of interest is the most recent confirmed case, a male animal purchased on the 3rd March 2008 from the original infected herd, and tested clear by the comparative intradermal test on the 20th June. As the test was carried out prior to the recommended 120 days after potential exposure, the goat was retested in September, failed the skin test and had extensive lung and associated lymph node lesions at postmortem examination.

Every animal that has failed the comparative test to date has either shown visible lesions at necropsy or was cultured positive for *Mycobacterium bovis*. The skin test therefore appears to have a high predictive value in goats based on this small sample.

Avian Tuberculosis - One RL also reported *Mycobacterium avium* infection (cultured from caseous lesions in mediastinal lymph nodes) in a 2½ year old castrated male goat showing illthrift. It also had an intestinal adenocarcinoma and this may have resulted in a degree of immunosuppression and increased susceptibility. Animal Health were notified early in the investigation, other goats on the small holding were tested by the comparative skin test and no *M. bovis* reaction was identified.

Bluetongue Suspicion - A two-year-old goat submitted for postmortem examination at one RL showed marked oedema of the subcutaneous tissue over the face, with multiple haemorrhages over the gums and internal viscera including lungs that were also very oedematous. Bluetongue infection could not be ruled out, Animal Health were informed and samples taken. BTV was subsequently ruled out, and

disseminated intravascular coagulation associated with disseminated fungal infection was eventually confirmed histologically.

Malignant Catarrhal Fever - A condition rarely reported in goats, MCF was suspected in an 18-month-old pet goat with severe generalised skin scaling. The histological picture was typical, and a blood sample gave a positive result for OvHV-2 DNA by PCR. There had been reported contact between goats and sheep.

Polioencephalitis - This condition was identified in a 12-month-old goat kid the only one affected in a group of 80 yearling goats on a dairy farm of 120. It had shown nervous signs for 3 days prior to submission and histological examination revealed a marked polioencephalitis affecting large areas of the brain. The histological picture was characteristic of a neurotropic virus the most likely of which was Louping-ill virus however this was not confirmed and the exact cause of the nervous signs remained speculative.

Orf – Severe Orf lesions were described by one RL in bottle fed kids in the first week of life. There was excessive salivation and bleeding around the mouths at feeding, resulting from large irregularly shaped papular lesions around the molar and premolar teeth. Parapoxvirus was confirmed by EM.

PGE – PGE was at a particularly high level this quarter with 38.2% of goat holdings submitting material for laboratory examination resulting in a confirmed diagnosis.

SYNDROMIC DISEASE ANALYSIS: Alimentary tract disease in post weaned lambs July-September 2008

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, ill thrift, abortion and nervous diseases) and for the main body systems (e.g. cardiovascular, respiratory, urinary). This data can be further examined for other major risk factors, such as type of sheep, housing, organic status and age, which are also recorded routinely for each submission. For this report, gastro-intestinal disease in post-weaned lambs in the third quarter of the year (July to September) has been analysed as an example of this type of surveillance.

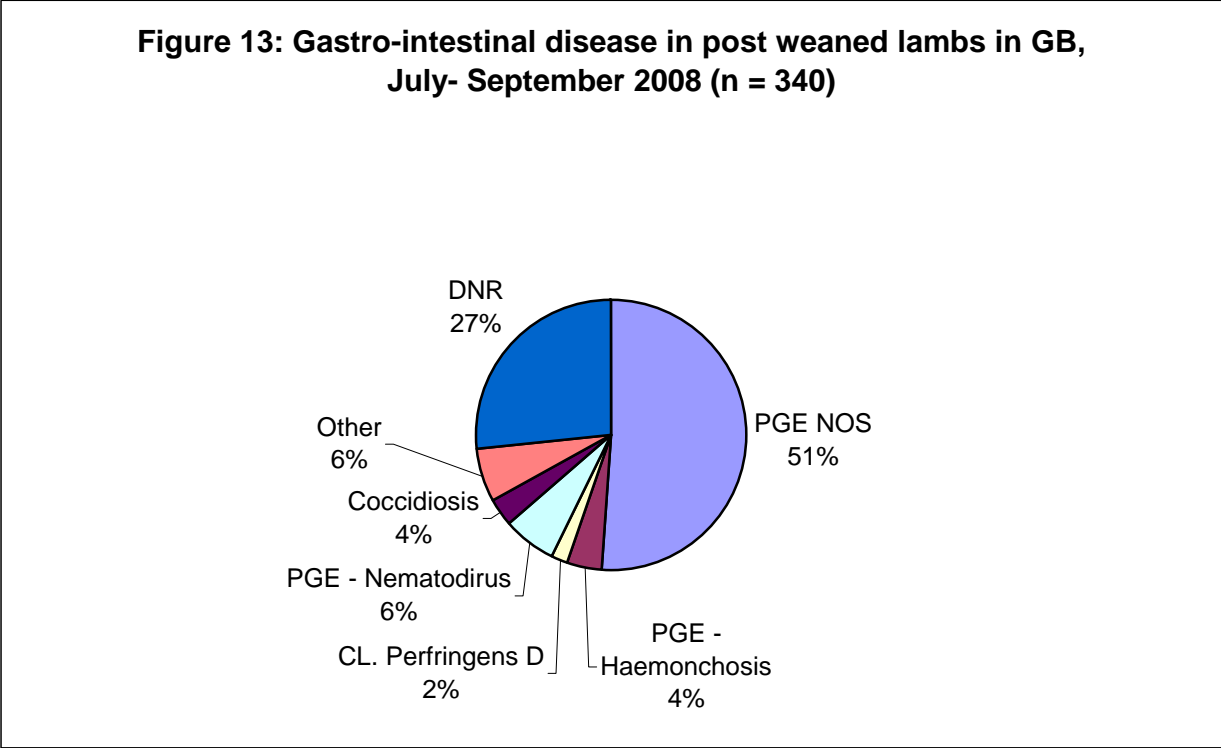
Introduction

Depending on the exact purpose, breed, available resources and time of year, lambs may be weaned from as early as four-weeks-old in the case of orphans, from about 12 weeks onwards in commercial flocks where lambs are sold straight from the ewe, and from 16 – 18 weeks in lambs retained for further breeding or further fattening. Sheep from 12-months-old are classed as adult. The age range in the post-weaned group is therefore large and is reflected by the wide variety of illnesses seen in this age group. This period is also associated with changes in diet and management that can influence the type of diseases encountered.

General

Figures 13 – 15 refer to diagnoses of gastro-intestinal disease made where the age was indicated as post-weaned lambs. Diagnoses with low numbers and percentages less than 2% were grouped together as “Other”. DNR refers to submissions where a diagnosis was not reached, despite reasonable testing.

In GB for the third quarter of 2008, a total of 340 submissions were in this category. The majority of submissions, 51%, were diagnosed with “PGE – NOS” (i.e. parasitic gastroenteritis, not otherwise specified). All other conditions were at levels of 6% or less. In 91 submissions (27%) a diagnosis was not reached despite reasonable testing.



It is not possible to compare GB figures for this quarter with previous years as age category was not harmonised between VLA and SAC until 2007. Instead VLA data for England and Wales for July to September 2008 has been compared with VLA data for the same quarter in the previous 4 years in figures 14 and 15.

The GB data and the England and Wales data for 2008 are very similar. "PGE – NOS" was also the most common diagnosis in England and Wales with 51% for Q3 2008. 43% of England and Wales diagnoses were PGE NOS in Q3 2004 – 2007. 28% of the 288 submissions for Q3 2008 and 34% of the 890 submissions for Q3 2004 – 2007 were not diagnosed despite reasonable testing.

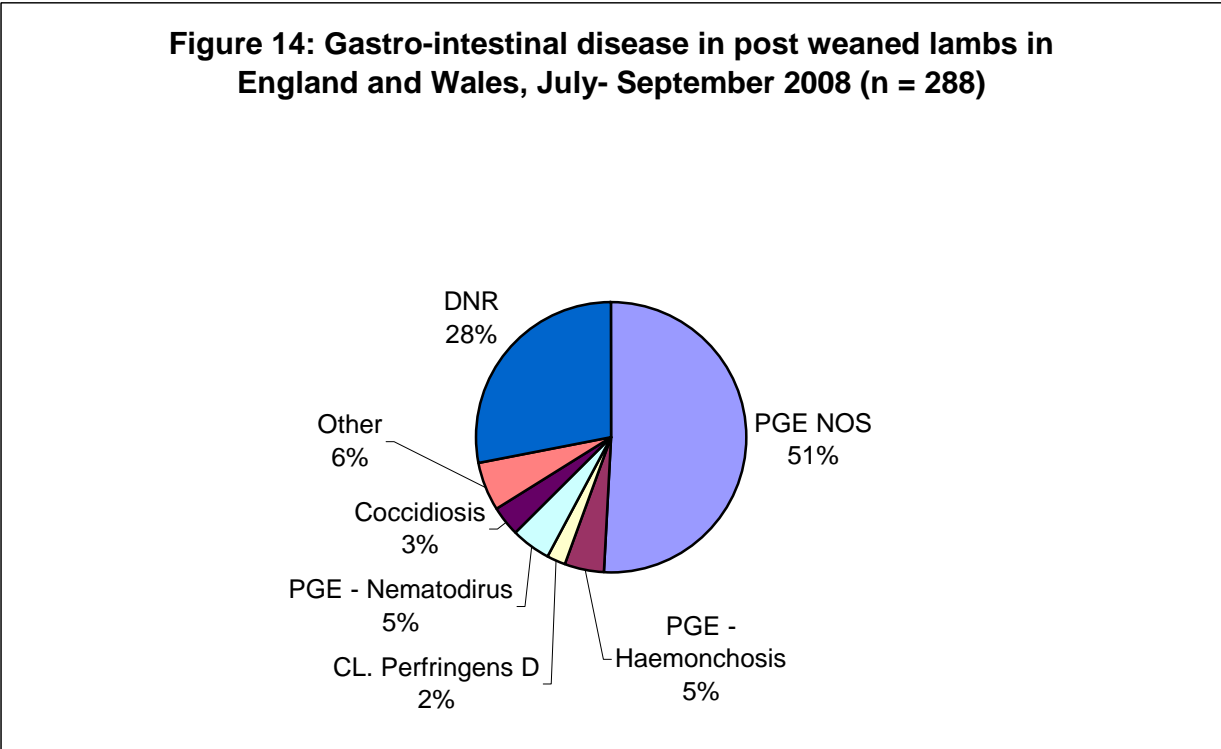
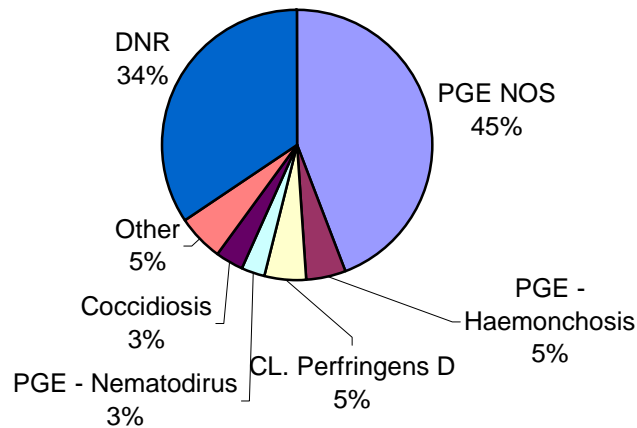


Figure 15: Gastro-intestinal disease in post weaned lambs in England and Wales, July-September 2004-2007 (n = 890)



Specific diseases discussion:

Parasitic gastroenteritis (PGE)

This was the most common diagnosis in post weaned lambs in this quarter in 2008, and also in the cumulative data in previous years and is associated with various gastro-intestinal parasites, usually *Teladorsagia/Ostertagia* and *Trichostrongylus* spp. This group of animals is very susceptible to endoparasitic diseases as this is likely to be the first time they have been exposed and have not had time to develop protective immunity.

PGE-Nematodirosis

Diagnoses of nematodirosis (disease caused by *Nematodirus* spp. predominantly *N. battus*) in England and Wales have also increased from 3% to 5% when 2008 is compared to the previous 4 years, but numbers of incidents are small. Research has suggested that *Nematodirus battus* is altering its behaviour and incidents of disease are occurring over a longer time period, particularly in the south of the country (J. van Dijk and E. R. Morgan, *Parasitology* (2008) 135, 269-283 and J. van Dijk et al, *Veterinary parasitology* (2008)158, 73-84). These results may support this occurrence.

PGE-Haemonchosis

Disease caused by *Haemonchus contortus*, comprised 4% of the diagnoses this quarter. This parasite is a particular problem in the tropics and sub-tropics and the concern is that, with increasing temperatures, it may become a greater problem in GB.

Other diseases

Of the clostridial diseases, only *Cl. perfringens* type D (Pulpy kidney/enterotoxaemia) was diagnosed on more than one occasion, with six incidents recorded by VLA for Q3 2008 and 44 for Q3 2004 – 2007. Acidosis, which was only diagnosed on three occasions this quarter and 14 times in previous quarters, is usually related to the introduction of creep feed or isolated incidents where animals gain access to stored or spilled grain. Intestinal torsion or redgut is a sporadic and fatal condition of ruminating sheep, mostly recorded as sudden deaths. The disease is usually seen a few weeks after introduction to lush pastures,

especially legumes. The readily fermented crops have a rapid passage through the fore stomachs with increased fermentation in the large intestine, which then increases in size. The increased size of the organ can then lead to instability and torsion. Losses are usually limited to single sporadic cases, but can be as high as 20%. This condition was diagnosed on two occasions by VLA this quarter and on eight occasions in the previous quarters.

SCANNING SURVEILLANCE FOR NEW AND EMERGING DISEASES IN SMALL RUMINANTS

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 probably first be detected by observation of increased numbers of submissions for clinical and/or pathological syndromes for which a diagnosis could not be reached in the normal way. Submissions for which no diagnosis is reached (DNR) despite testing deemed to allow reasonable potential for a diagnosis to be reached are regularly analysed to look for increases in undiagnosed disease which could indicate the presence of a new or emerging 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. For a full account of the methodology, please consult:

<http://vla28/reports/diagnosis%20not%20reached/default.asp>

Data recording by VLA and SAC was harmonised from 2007. In this report GB data from the third quarter of 2008 is compared with the data from the equivalent quarter in 2007, because only limited data from SAC is available at present. VLA data for this quarter has also been compared with pooled data for the five previous years.

Supplementary analysis of VLA DNR data is also undertaken using an early detection system (EDS). This uses a statistical algorithm to estimate an expected number of DNR reports and a threshold value. If the current number of DNR reports exceeds the threshold (i.e. exceedance score > 1), this indicates that the number of reports is statistically higher than expected.

Summary

Data analysis revealed no changes thought to constitute evidence of emergence of new, undiagnosed disease in sheep or goats during the quarter.

- There were no statistically significant increases for any of the syndromes or presenting signs in sheep or goats, in GB for the 3rd quarter as compared to the equivalent quarter in 2007
- Statistically significant decreases were seen in the GB sheep figures overall and for the enteric and skin syndromes and for the recumbency and skin presenting signs for this quarter as compared to the equivalent quarter in 2007.
- Statistically significant decreases were also seen in the GB goat figures overall, the enteric syndrome and the presenting sign of diarrhoea.
- It was previously noted that sheep submissions to the VLA related to the “nervous/sensory” body system would be scrutinized in 2008 following an increase in % DNR in 2007. % DNR for this body system gave no cause for concern in Q3 2008.

A: OVERALL FIGURES**SHEEP**

During Q3 2008, the percentage of diagnostic submissions where a diagnosis was not reached (DNR) was 15 % compared to 20 % in the same quarter in 2007. The decrease is statistically significant ($Z = -3.10$). There was a significant decrease for both the overall VLA and the SAC figures, with the percentage for VLA submissions decreasing from 20% for Q3 2007 to 15% for this quarter and for SAC submissions decreasing from 20% to 15%.

GOATS

There was a significant ($Z = -2.05$) decrease in the percentage of DNR submissions from 27% for Q3 2007 to 16% for Q3 2008. The separate VLA and SAC figures reflect this change.

B: DNR ANALYSIS BY SYNDROME/BODY SYSTEM**GB – SHEEP**

- Statistically significant decreases were seen in the GB sheep figures for the enteric and skin syndromes for this quarter as compared to the equivalent quarter in 2007 (table 8). This is a positive change as it indicates a higher rate of diagnosis for these specific syndromes. The decrease for both syndromes is statistically significant for SAC.
- VLA shows a statistically significant decrease for the skin and systematic and miscellaneous syndromes as compared with Q3 07, but not when compared with pooled data Q3 2003 to 2007.

Table 8: Summary of the changes in undiagnosed ovine disease (GB), by syndrome, between Q3 2007 and Q3 2008.

Syndrome/Body System	%DNR Q3 2007 (n= 1 155)	Change	%DNR Q3 2008 (n= 1 238)	z ‡
Circulatory	0	=	0	
Enteric	16	↓	12	-2.12
Mastitis	0	=	0	
Musculoskeletal	20	↑	29	
Nervous	10	↓	8	-0.36
Reproductive	33	=	33	
Respiratory	4	↑	6	0.63
Skin	36	↓	18	-3.25
Systemic & Miscellaneous	16	↓	10	-1.91
Urinary	17	↓	7	
Overall	20	↓	15	-3.1

‡ statistically significant if $z > 1.96$ or $z < -1.96$ (not calculated if $N < 40$). Significant values in **bold**.

GB – GOATS

There was a statistically significant ($z = -2.36$) decrease in the percentage DNR for the enteric syndrome for this quarter (8%) as compared to Q3 prior years (21%). The VLA figures show a similar decrease for this syndrome. SAC figures too low for analysis.

C: ANALYSIS BY PRESENTING SIGN**GB - SHEEP**

- There was a statistically significant ($z = -2.68$) decrease for the presenting sign recumbency with DNR down from 24% Q3 prior years to 0% Q3 08. The individual VLA and SAC figures reflect this, but are too low for statistical analysis.

- The DNR for the presenting sign skin decreased from 31% Q3 prior years to 18% for Q3 08. This difference is statistically significant ($z=-2.43$) Both the VLA and SAC show similar significant decreases.

GB – GOATS

- For the presenting sign diarrhoea there was a statistically significant decrease from 31% in Q3 prior years to 9% for this quarter ($Z= -2.6$) The VLA figures show a similar decrease. SAC figures too low for analysis.

C: EARLY DETECTION SURVEILLANCE (EDS) MODEL

EDS did not indicate a significant change in number of DNR submissions for any body system in any month in Q3 2008.