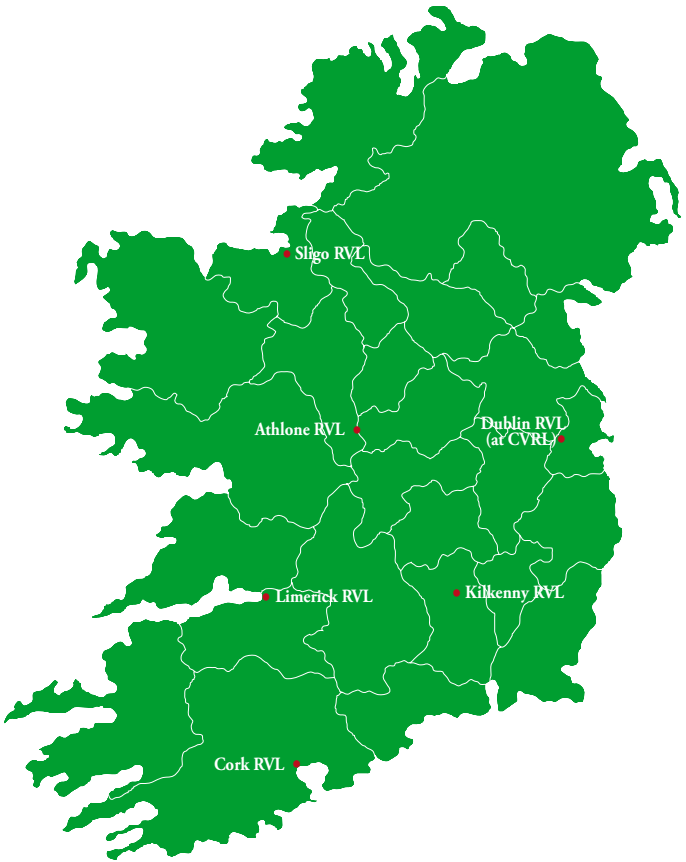


REGIONAL VETERINARY
LABORATORIES DISEASE
SURVEILLANCE REPORT

2005



THE DEPARTMENT OF
AGRICULTURE & FOOD
AN ROINN TALMHAÍOCHTA AGUS BIA



Sligo RVL


Athlone RVL

Dublin RVL
(at CVRL)

Limerick RVL


Kilkenny RVL

Cork RVL



REGIONAL VETERINARY LABORATORIES DISEASE SURVEILLANCE REPORT 2005

Contents	Page
Surveillance for endemic and exotic diseases in Irish livestock	4
Causes of bovine mortality	5
Bacterial agents isolated from aborted bovine foetuses	9
Causes of ovine abortion	11
Causes of ovine mortality	12
Neonatal calf enteritis pathogens detected	14
Bovine mastitis pathogens detected in the RVLs in 2005	16
Protocol for composite milk sample collection and handling	19
Investigation of suspect foot-and-mouth-like lesions in pigs <i>Donal Toolan</i>	21
Investigation of a suspect FMD outbreak in Cork <i>Eugene Power</i>	23



Surveillance for endemic and exotic diseases in Irish livestock

Irish livestock and livestock products output accounted for €3,652 million or 73% of total agricultural goods output at producer prices in 2005 and its value is highly dependent on the high animal health status of the Irish livestock population.

One of the primary roles of the Regional Veterinary Laboratories (RVLs), together with the Central Veterinary Research Laboratory (CVRL) and other branches of the State Veterinary Service, is to monitor the animal health status of the Irish livestock population. This is achieved by carrying out continuous surveillance for endemic animal disease conditions in Irish livestock. The Department of Agriculture, through its strategically located countrywide network of Regional Veterinary Laboratories, provides a laboratory diagnostic service that is easily accessible to herdowners who, in consultation with their private veterinary practitioner (PVP), wish to submit farm animals for postmortem examination in order to identify the causes of death.

Acknowledgements

The information presented in this report is primarily based on the results of gross necropsy, virological, microbiological, biochemical, parasitological and histopathological examinations undertaken in the six RVLs - in Athlone, Cork, Dublin, Kilkenny, Limerick and Sligo - in 2005. The Central Veterinary Laboratory at Abbotstown, in its role as the National Reference Laboratory for many exotic diseases, provides additional laboratory support as required. Dublin RVL is a section of CVRL.

These reports were compiled by analysis of the Regional Veterinary Laboratory results for 2005 by William Byrne, Micheál Casey, Paul Collery, John Fagan, Alan Johnson, John Moriarty, Peter O'Neill and Cosme Sanchez-Miguel and by accounts of suspect Class A disease investigations by Donal Toolan and Eugene Power.

Causes of bovine mortality

Many of the carcasses examined were individual animals submitted as samples from herds in which other animals with similar clinical signs had also died. The results of each postmortem examination and associated diagnostic tests were routinely reported to the PVP and the herdowner. In this report the diagnoses have been collated to identify the most commonly diagnosed causes of bovine mortality in 2005, for the different age groups.

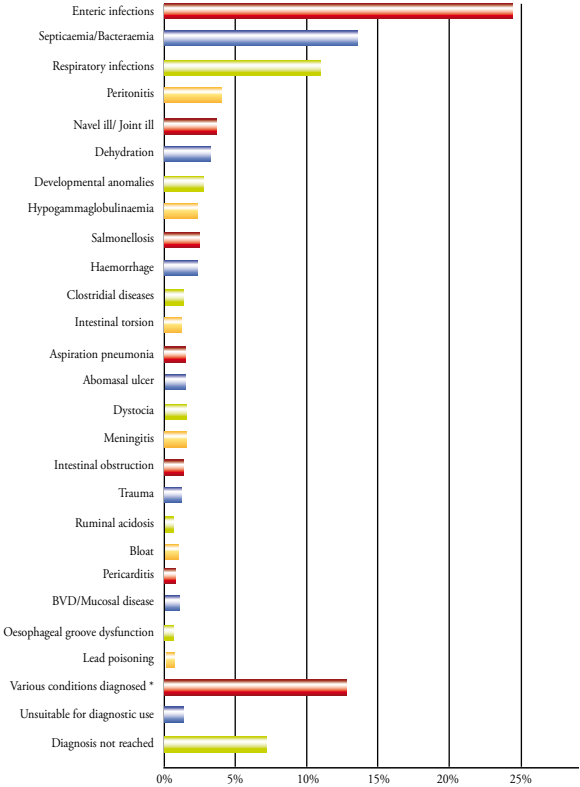


Figure 1. Causes of bovine mortality in calves examined from birth to one month old.

** This category represents conditions diagnosed in insufficient numbers to merit a category of their own.*

Examination of Figure 1 shows that enteric infections are the most frequent causes of deaths in neonatal calves, accounting for almost one quarter of the deaths.

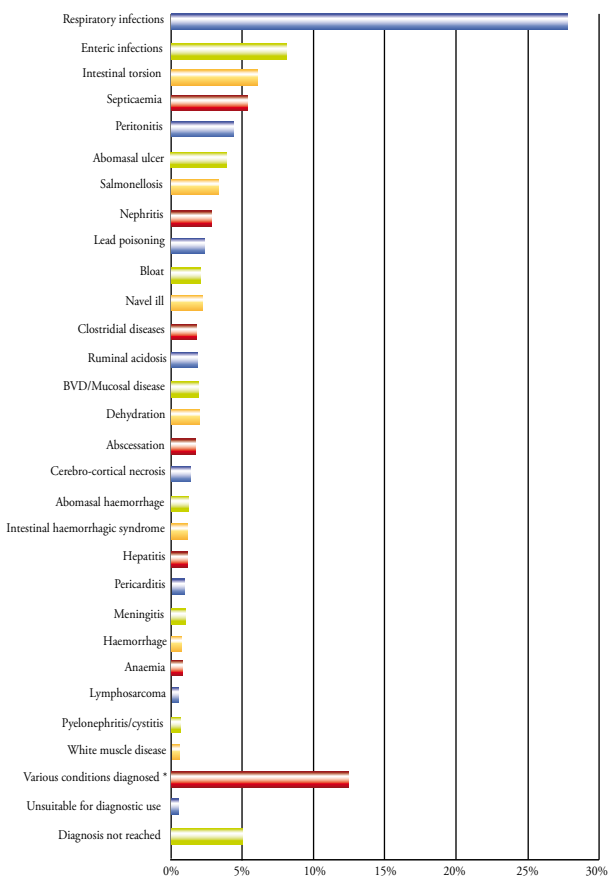


Figure 2. Causes of bovine mortality in calves examined from one month to three months of age.

* This category represents conditions diagnosed in insufficient numbers to merit a category of their own.

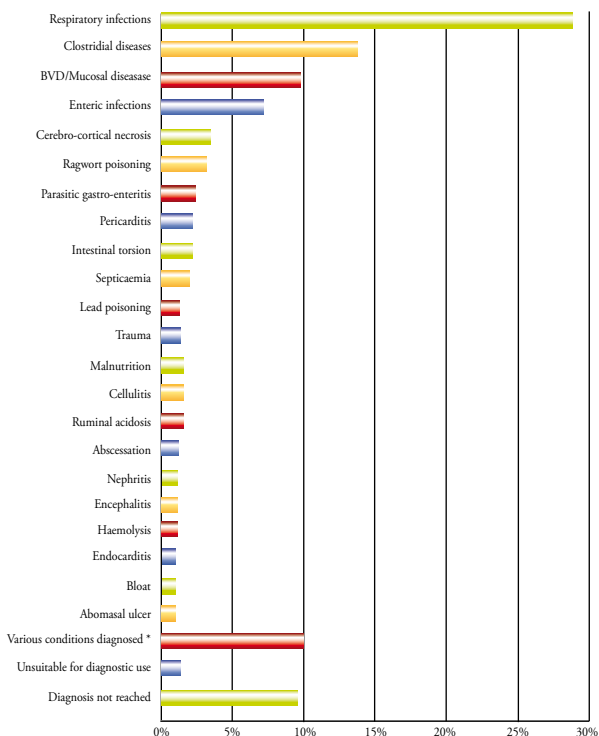


Figure 3. Causes of bovine mortality in calves examined from three months to one year of age.

** This category represents conditions diagnosed in insufficient numbers to merit a category of their own.*

The importance of enteric infections as a cause of mortality decreases in older animals, as shown in Figures 2, 3, and 4. However, as the animals get older, respiratory infections become the most frequent causes of death in the one to three and three to twelve-month-old age groups, accounting for over a quarter of the deaths (Figures 2 and 3). Clostridial infections remain a relatively unimportant cause of death in calves up to three months of age. However, their significance increases in bovine animals over three months and in those over 12 months (Figures 3 and 4). BVD/mucosal disease also becomes a more significant cause of mortality in the older age groups.

Lead poisoning causes losses in calves and older animals. Intestinal torsion was a significant cause of death in the one to three month age group - this category includes mesenteric torsions. Abomasal ulceration and its consequences (perforation and peritonitis) are frequently seen in calves up to three months of age.

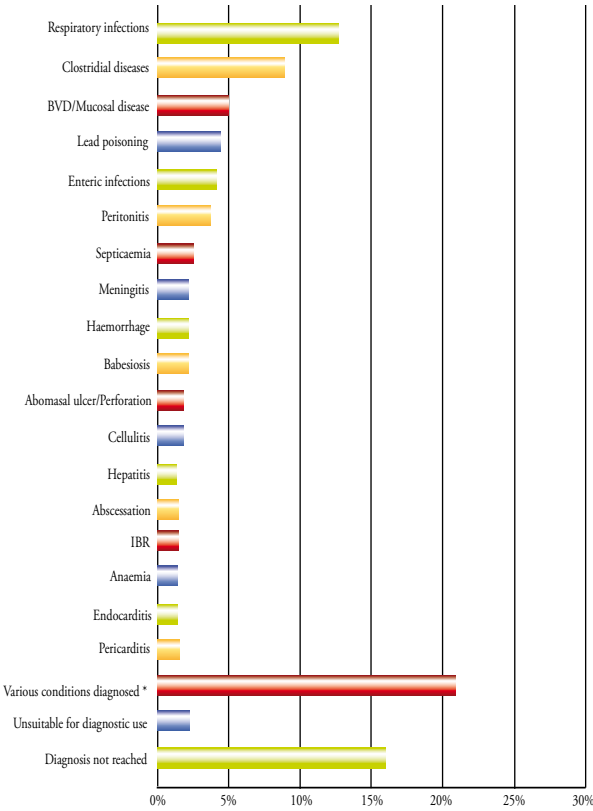


Figure 4. Causes of mortality in bovine animals that were older than one year.

* This category represents conditions diagnosed in insufficient numbers to merit a category of their own.



Bacterial agents isolated from aborted bovine fetuses

Abortion and stillbirth are important causes of production losses in the livestock industry. Abortion is also the principal manifestation of bovine brucellosis. The Veterinary Laboratory Service provides assistance to herdowners for the diagnosis of abortion through private veterinary practitioners (PVPs) and also examines all bovine aborted fetuses for *Brucella abortus* as a critical component of the Department of Agriculture's brucellosis eradication scheme. A relatively small number of aborted fetuses were examined on farms by PVPs who collected samples of stomach contents or placenta and submitted them to the RVL for similar examination.

Foetal abomasal contents, and their dams' placentas, were examined in the laboratory for *Brucella abortus* and other bacterial abortifacient agents using selective culture media and/or tests (FAT, ELISA, histopathology).

The relative frequencies of isolation of the different species of bacteria from aborted foeti are shown in Table 1. Abortion can also occur sporadically due to non-infectious causes including physiological causes. Autolysis of foetal and/or placental material may occur even *in utero* and may adversely affect the suitability of the sample submitted for detection of infectious agents. For the latter reason, it may often be necessary to submit two or more fetuses and placentas from a herd in which an abortion outbreak occurs in order to detect an infectious cause of abortion.

Therefore, it is likely that the data in Table 1 are an underestimation of the true proportion of abortions that are caused by infectious agents due to various factors such as autolysis, prolonged retention of the foetus in the uterus, or difficulty in obtaining optimal diagnostic material, for example in the case of mummified or scavenged fetuses.

Abortifacient agents isolated	Percentage of samples positive
<i>Salmonella</i> species	8.1%
<i>Arcanobacterium pyogenes</i>	6.5%
<i>Bacillus licheniformis</i>	3.2%
<i>Listeria monocytogenes</i>	2.5%
<i>Aspergillus fumigatus</i>	0.8%
<i>Brucella abortus</i>	0.2%
Opportunistic bacteria isolated	
<i>Enterobacteriaceae</i> (other than <i>Salmonella</i>)	5.1%
<i>Streptococcus</i> sp.	1.7%
Other mycotic spp.	1.1%
<i>Staphylococcus</i> sp.	0.6%
<i>Yersinia</i> sp.	0.2%
<i>Pseudomonas aeruginosa</i>	0.1%
<i>Campylobacter</i> sp.	0.1%
<i>Actinomyces</i> sp.	0.1%
<i>Aeromonas hydrophila</i>	0.1%

Table 1. Bacterial and fungal pathogens isolated from samples from bovine abortions in 2005

*These samples include samples derived from foeti submitted and also placental foetal stomach contents samples collected by PVPs. Pathogens isolated from twins were counted as one event.

Also included in Table 1 are some other species of bacteria detected in the tissues of aborted foeti, which may be opportunistic secondary invaders and are not usually considered to be primary causes of infectious bovine abortion. The figures above represent infectious abortions of bacterial or fungal aetiology. The protozoan organism *Neospora caninum* has also been associated with increasing frequency with bovine abortion following the detection of specific antibodies in foetal or maternal serum and/or by characteristic foetal histopathological changes. Agents which are not detected by the same selective culture procedures as the bacteria listed in Table 1, such as *Leptospira hardjo* and BVD virus, can also cause abortion.

Causes of ovine abortion

Protozoa (primarily *Toxoplasma gondii*) were the most commonly detected cause of ovine abortion, accounting for 23.6% of submissions. Bacterial agents were the next most frequently detected agents (Table 2).

	Percentage of samples positive
<i>Campylobacter</i> sp.	4.7%
<i>Streptococcus</i> (β haemolytic)	4.0%
<i>Salmonella</i> sp.	4.0%
<i>Arcanobacterium pyogenes</i>	2.7%
<i>Mucor</i> sp.	2.0%
<i>Aspergillus fumigatus</i>	2.0%
<i>Staphylococcus</i> sp.	0.7%
<i>Mannhemia haemolytica</i>	0.7%
<i>Listeria monocytogenes</i>	0.7%
<i>Bacillus licheniformis</i>	0.7%
<i>Brucella</i> sp.	0.0%

Table 2. Bacterial agents isolated from cases of ovine abortion in 2005.

The optimal sample for detection of *Chlamydophila abortus* (the causal agent of enzootic abortion of ewes) is fresh ovine placenta (particularly cotyledon tissue). Because of low frequency of submission of fresh ovine placenta from each abortion outbreak, there may be a consequently reduced ability to detect *Chlamydophila abortus*.

Causes of ovine mortality

Figures 5 and 6 illustrate the frequency with which each disease was recorded in lambs less than six months old and for all sheep over six months old respectively. Diseases which were recorded at a frequency of less than 1% of all diagnoses for the age group have been grouped and shown as other diseases.

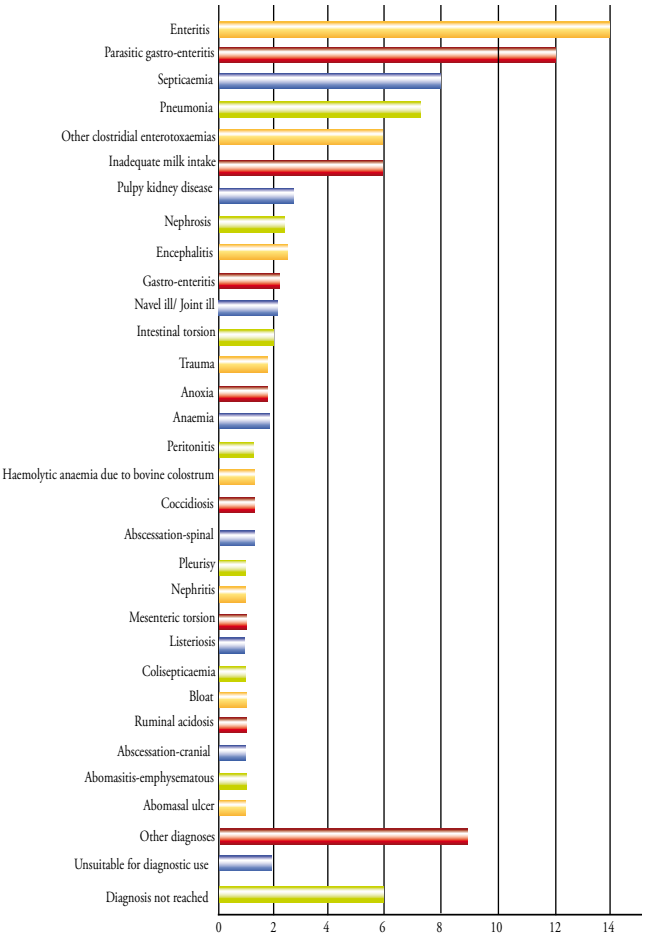


Figure 5. Diagnoses recorded in lambs less than six months old.

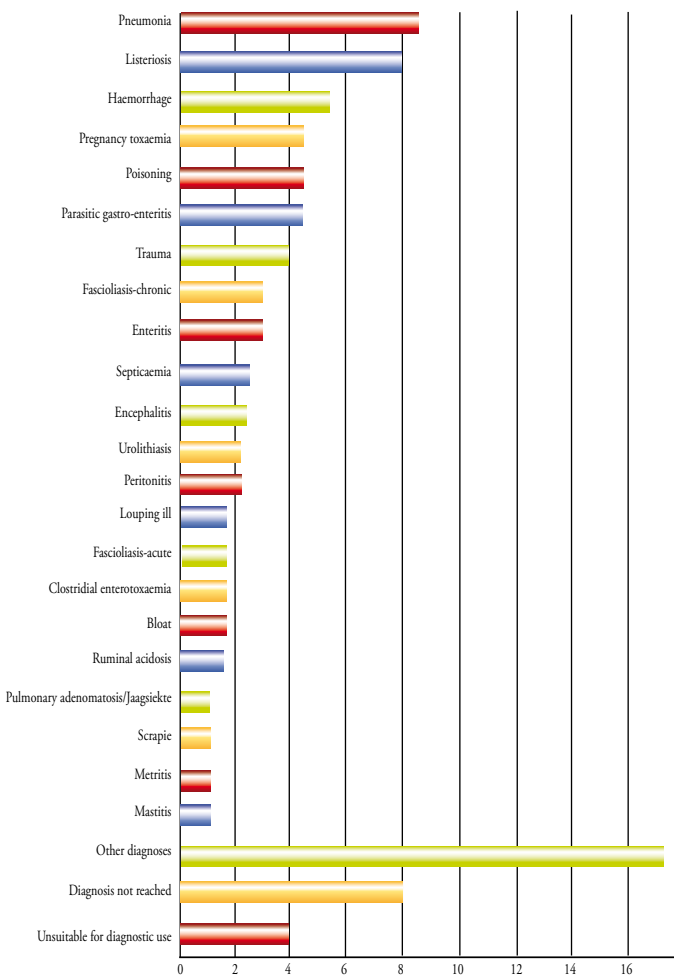


Figure 6. Causes of mortality in ovines that were older than six months.

Note that while scrapie is included as a diagnosis in Figure 6, the data set does not include samples submitted to the CVRL and Regional Laboratories as TSE suspects or for confirmatory TSE testing. Where 'scrapie' is recorded as the diagnosis, in Figure 6, this relates to carcasses submitted for postmortem examination without being classified as 'scrapie suspects' at the time of presentation to the Regional Veterinary Laboratory for examination.

Neonatal calf enteritis pathogens detected

Enteritis is one of the commonest causes of deaths of calves within the first month of life and particularly within the first two to three weeks after birth (see Figure 1, page 5). Several different infectious agents are capable of causing enteritis in young calves, especially if the calf is lacking sufficient absorbed maternal antibodies and if the calves' environment is heavily contaminated by these infectious agents.

	<i>Number of samples tested</i>	<i>Number positive</i>	<i>Percentage positive</i>
Rotavirus	2584	741	28.7%
<i>Cryptosporidia</i>	2588	604	23.3%
Coronavirus	2085	47	2.3%
<i>Escherichia coli</i> K99	1455	21	1.4%
<i>Salmonella</i> sp.	2587	74	2.9%
<i>Coccidia</i>	654	49	7.5%

Table 3. Percentage of calf enteritis samples positive for each enteric pathogen

Rotavirus (28.7% positive) and *Cryptosporidia* species (23.3% positive) were the most frequently detected agents associated with calf enteritis in samples examined in the six RVLs in 2005 (Table 3). Coronavirus (2.3% positive) and *E. coli* K99 were less commonly detected. *Salmonella* species were isolated in 2.9% of samples examined in 2005. *Salmonella dublin* (2.6% positive) and *Salmonella typhimurium* (0.2% positive) are of greater importance than suggested by their rate of occurrence in cases of calf enteritis because of their ability to cause septicaemia, abortion, etc. in older bovine animals and also in man.

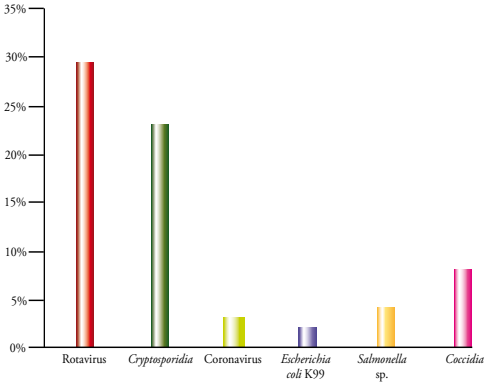


Figure 7. Percentage of calf enteritis samples positive for each enteric pathogen.

While the use of vaccines to prevent enteritis associated with some of the commonly found agents identified above is an important component in the control of enteric diseases in calves, their use should be accompanied by basic hygiene and biosecurity measures.

Bovine mastitis pathogens detected in the RVLs in 2005

Mastitis, both clinical and sub-clinical, has long been considered to be the most costly disease of dairy herds in Ireland, as it significantly depresses milk yield through damage to mammary gland secretory tissue, and is associated with additional losses resulting from milk being discarded as a result of treatment with antibiotics. The majority of samples received in the Veterinary Laboratory Service (VLS) were from individual cows, either from cows with chronic clinical mastitis or from cows with high somatic cell counts but no evidence of clinical mastitis. The latter type were frequently composite samples, containing milk from all four quarters. Bulk tank samples, incorporating milk from all cows in the herd, were commonly submitted in autumn when farmers were considering the selection of an appropriate antibiotic for dry cow therapy.

The submissions followed a seasonal pattern (Figure 8), with the numbers rising as the year progressed, peaking in the months of October and November. This is associated with the seasonality of milk production in Ireland, with a spring-based calving pattern.

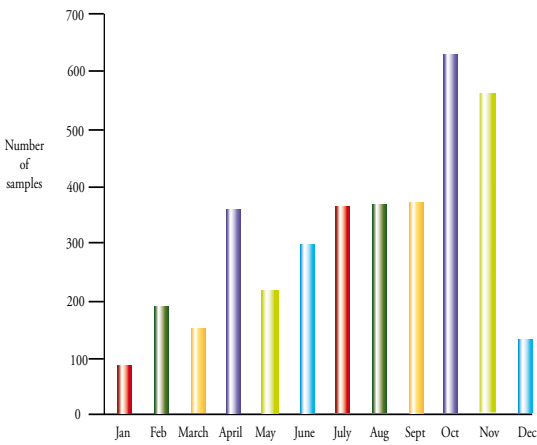


Figure 8. Milk sample submissions by month.

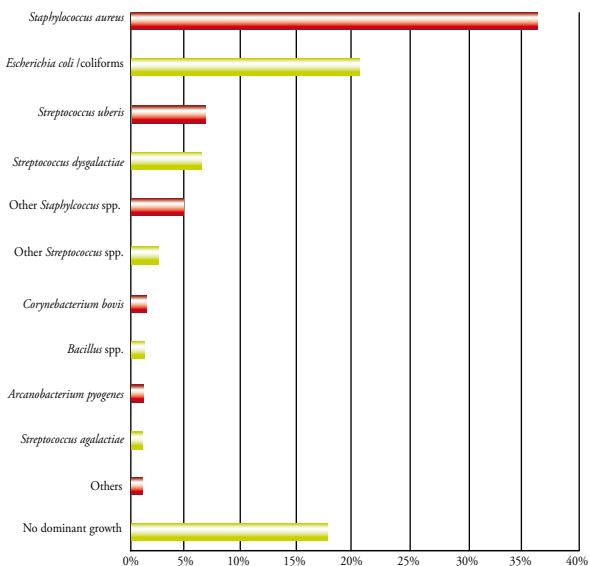


Figure 9. Mastitis pathogen isolation rates.

Staphylococcus aureus was the most common pathogen isolated (Figure 9). This finding is similar to that in previous years and illustrates how significant a role the pathogen plays in the udder health of dairy cows. *Staphylococcus aureus* is a ‘contagious’ mastitis pathogen, typically spread from cow to cow on the milking equipment

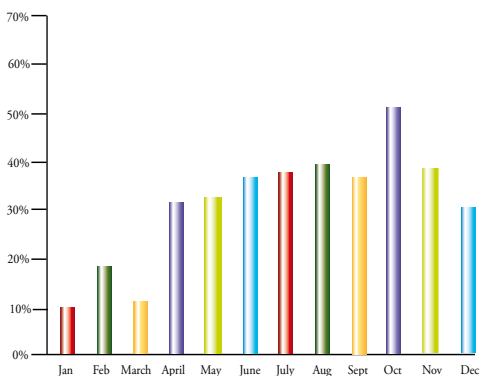


Figure 10. Isolation rate by month of *Staphylococcus aureus* from milk.

or milker's hands.

The relatively high bulk somatic cell count cut off point implemented by the majority of dairy processors in Ireland (>400,000 cells/ml) has meant that there may be a significant level of sub-clinical mastitis present in the herd before the dairy producer realises that there is a problem. Figure 10 (page 17) illustrates how the isolation rate of *Staphylococcus aureus* rose from just below 20 per cent in February to above 50 per cent in October.

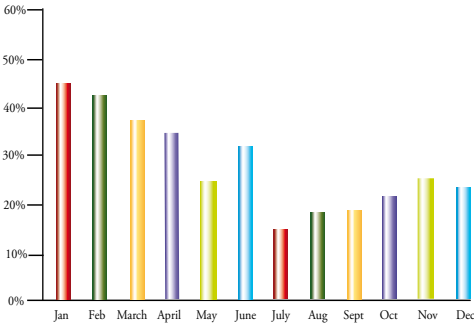


Figure 11. Isolation rate by month of *Escherichia coli* from milk.

Escherichia coli was isolated from 20.7% of the milk samples. The reservoir for *E. coli* is the environment, with infection typically occurring following contamination of the udder with bedding or faecal material. One would expect a higher isolation rate when cows are housed in the winter/spring months and Figure 4 (page 8) shows that this is indeed the case. However, the isolation rate for the organism is high throughout the year, suggesting that sample contamination is a significant problem. It is not possible to differentiate between *E. coli* isolated from mastitic milk or as a result of sample contamination. Good sample collection technique dramatically reduces the risk of contamination. A mastitis control plan should always incorporate an improved hygiene component, that will reduce bacterial contamination, rather than over reliance on the use of antibiotics. Adherence to the following protocol will greatly reduce sample contamination.

Protocol for composite milk sample collection and handling

The quality of milk samples taken for laboratory examination is extremely important. An aseptic technique for sample collection is a necessity. Contaminated samples lead to misdiagnosis, confusion and frustration. If a dairy farmer is to base his/her lactating or dry cow therapy decisions on the results of a small number of milk samples, it is vital that the proper procedures are followed. Composite samples are more likely to become contaminated than individual quarter samples.

Materials for sampling

Disposable gloves (if available)

Sterile screw-top plastic tubes (20ml capacity approximately)


70% Alcohol (or methylated spirits if this is unavailable)

Cotton wool balls

Paper towels

Sampling technique

1. Take the samples before milking.
2. Soak a number of cotton wool balls in alcohol.
3. Label the tubes prior to sampling with the cow number and date.
4. Using a hand or paper towel, brush any loose dirt, straw or hair from the underside of the udder and teats. Washing should be avoided if possible, but if teats are very dirty they should be washed and carefully dried with paper towels.
5. Dip all four teats with teat dip and leave for at least one minute.
6. Wear gloves if available. If not, then wash and dry the hands thoroughly and use some of the cotton wool balls to wipe them with alcohol.
7. Beginning with teats on the far side of the udder, scrub the ends thoroughly with the cotton wool and alcohol until the teats are very clean. Spend at least ten seconds on each teat. Do not use a cotton wool ball on more than one teat.
8. Begin sampling with the teats on the near side of the udder. Remove the cap of the sampling tube and keep the top face down in the palm. Hold the open tube (in the same hand as the top) at an angle of 45 degrees (holding it straight up will allow dust etc. to fall inside). Using the free hand, discard a few streams of milk on to the ground before collecting three or four streams in the tube. Do not allow the teat ends to make contact with the tube. Move quickly onto the next teat. When the four teats have been sampled close the tube.

- 
9. If it is felt that some contamination has occurred, discard the sample and use a new tube.
 10. When all cows have been sampled, put the tubes in a fridge and cool to 4°C. This is very important.
 11. The samples should be taken to the laboratory as quickly as possible. If the milk-tank driver is collecting samples, ensure that he/she puts the samples in the cool box.



Investigation of suspect foot-and-mouth-like lesions in pigs

Dónal P. Toolan, Regional Veterinary Laboratory, Hebron Road, Leggatsrath, Kilkenny.

Three pigs in a batch of 12 pigs were noticed to be salivating in an abattoir lairage overnight. Some of the group were also lame and one was inclined to lie down frequently. Foot and mouth disease was suspected.

More detailed inspection revealed that the pigs were alert and afebrile. Eleven of the 12 had lesions on the coronets. Between one and three feet were affected on individual pigs. Colourless or blood-tinged fluid was noticed on the hooves of many animals. Most of the lesions were linear ulcers on the coronets of the main digits. The edge of the epithelium was lifting in some cases, however no vesicles were seen. The accessory digits or the interdigital spaces were not affected in any of the pigs (see Figures 12 and 13, pages 22 and 23). Consistent salivation was not observed in any animals. The level of salivation in the group did not seem significantly greater than in other pigs in the lairage. No mouth lesions were seen. Four animals had a linear lesion parallel to the dorsal margin of the front of the snout. These lesions were deemed to have been traumatic in origin. One animal had a small circular ulcer on its snout that appeared to be of long standing.

The pigs originated from a four-sow unit that contained less than 40 pigs. Pigs were kept on a straw-bedded concrete floor surface. There was a land-fill site about 1 km from the farm. No lesions were found during a six-day observation period in any of the pigs on the holding of origin.



Figure 12. Coronary band lesion on one foot.

Results of tests for foot and mouth disease, swine vesicular disease, african swine fever and classical swine fever were negative. No bacteria or viral pathogens were detected by routine bacterial and viral culture of internal organs. Histopathological examination showed non-specific ulceration. No likely cause of traumatic injury was observed either on the farm of origin, in the trailer in which the pigs were transported, or in the slats in the lairage.

There was a history of diesel oil having been poured on the pigs before transport to minimise fighting but the pigs did not smell of diesel, nor did they appear oily or dirty. The lesions were unlikely to have been associated with exposure to diesel. It was not possible to arrive at a definite diagnosis in this investigation.

Kilkenny RVL investigated this case as part of a coordinated team investigation in accordance with Department of Agriculture Class A disease contingency plans which involved the District Veterinary Office, Central Veterinary Research Laboratory (CVRL), Department of Agriculture headquarters, Dublin and ultimately the Foot and Mouth Virus Reference Laboratory, Pirbright, UK.



Figure 13. Another coronary band lesion.

Investigation of a suspect FMD outbreak in Cork (October, 2005)

Eugene Power, Regional Veterinary Laboratory, Model Farm Rd., Bishopstown, Cork

History. The herd contained 61 cows and followers: 155 cattle in total. The farm was located six miles west of the Cork RVL. There is an abattoir in the townland adjoining the farm.

On October 9, the herdowner observed that some of the 25 male calves at grass were off form and inappetent. The private veterinary practitioner (PVP) had visited the farm on October 10 and treated three calves that were salivating but had no mouth vesicles and no pyrexia or lameness. The PVP revisited on October 11. Some calves had mouth lesions and were pyrexia. The DVO Veterinary Inspector (VI) on duty was notified by the PVP of suspicions of FMD and the RVL was subsequently requested to attend the farm to assist in the diagnosis.



Figure 14. Lesions on first calf.

Two calves had erosions on their tongues (Figures 14 and 15, page 24 and 25) and one calf had small papules on the muzzle. The latter calf and one more calf had hyperaemic areas in the mouth. All four calves were pyrexemic. Lameness was not apparent in any of the calves and there were no clinical signs in the cows or the other cattle.

The lesions were of a type not seen before by any of the officers and a differential diagnosis was not apparent. The decision was made to treat this as a possible suspect FMD case. Scrapings of the lesions and blood samples were taken. Appropriate restrictions were placed on the farm and recent visitors to the farm were traced and also restricted.

Samples were brought to the Virology Section of the Central Veterinary Research Laboratory (CRVL). Serological tests for FMD were undertaken in the CRVL on October 12 and samples forwarded to the International Reference Laboratory, Pirbright. The serological tests at the CVRL were negative. Further sampling was conducted during the revisits and digital photographic images were obtained.



Figure 15. Lesions on second calf.

On October 14, as tests for FMD were officially reported as being negative, restrictions on the herd and all individuals were lifted. A further visit to the herd was undertaken on November 3 to obtain a second set of paired blood samples from the previously sampled calves.

Differential Diagnosis: The principal diseases considered were bovine viral diarrhoea (BVD) infection and bovine papular stomatitis (BPS). Such infections are common causes of mouth lesions in cattle in Ireland. Serology indicated that BVD had not been present. The diagnosis of BPS requires the demonstration of paravaccina virus by electron microscopy. The ingestion by the calves of an irritant was also considered as a cause but the location of the erosions did not appear consistent with either drinking or eating caustic material.

NAME	GRADE	ADDRESS
Athlone		
Fagan John	SRO	Coosan, Athlone, Co. Westmeath
Quinlan Jim	RO	Coosan, Athlone, Co. Westmeath
Murray Gerard	RO	Coosan, Athlone, Co. Westmeath
Cork		
Power Eugene	SRO	Model Farm Road, Bishopstown, Cork 4
Gomez Parada M	RO	Model Farm Road, Bishopstown, Cork 4
Sanchez Cosme	RO	Model Farm Road, Bishopstown, Cork 4
Kilkenny		
Moriarty John	SRO	Leggatsrath, Hebron Road, Kilkenny
Jones Philip	RO	Leggatsrath, Hebron Road, Kilkenny
Toolan Donal	RO	Leggatsrath, Hebron Road, Kilkenny
Limerick		
Bradley Jim	SRO	Knockalisheen, Limerick
Johnson Alan	RO	Knockalisheen, Limerick
Kelly Dave	RO	Knockalisheen, Limerick
Sligo		
Casey Micheal	SRO	Fawcett's Bridge, Doonally, Co. Sligo
O Muireagain Colm	RO	Fawcett's Bridge, Doonally, Co. Sligo
Barrett, Damien	RO	Fawcett's Bridge, Doonally, Co. Sligo
Dublin RVL		
Byrne William	SRO	Backweston Lab Complex, Youngs Cross, Celbridge, Co. Kildare
O'Neill Peter	RO	Backweston Lab Complex, Youngs Cross, Celbridge, Co. Kildare
Brady Colm	RO	Backweston Lab Complex, Youngs Cross, Celbridge, Co. Kildare

All faxes should be marked 'for the attention of...' and the name of the intended recipient

PHONE	FAX*	E-MAIL
09064 75514	09064 75215	john.fagan@agriculture.gov.ie
09064 75514	09064 75215	jim.quinlan@agriculture.gov.ie
09064 75514	09064 75215	gerard.murray@agriculture.gov.ie
021 4543931	021 4546153	eugene.power@agriculture.gov.ie
021 4543931	021 4546153	mercedes.gomezparada@agriculture.gov.ie
021 4543931	021 4546153	cosme.sanchez@agriculture.gov.ie
056 77 21688	056 77 64741	john.moriarty@agriculture.gov.ie
056 77 21688	056 77 64741	philip.jones@agriculture.gov.ie
056 77 21688	056 77 64741	donal.toolan@agriculture.gov.ie
061 452911	061 451849	jim.bradley@agriculture.gov.ie
061 452911	061 451849	alan.johnson@agriculture.gov.ie
061 452911	061 451849	dave.kelly@agriculture.gov.ie
071 9142191	071 9145900	micheal.casey@agriculture.gov.ie
071 9142191	071 9145900	colm.omuireagain@agriculture.gov.ie
071 9142191	071 9145900	damien.barrett@agriculture.gov.ie
01 6157115 01 6157235	01 6157199	william.byrne@agriculture.gov.ie
01 6157115 01 6157236	01 6157199	peter.oneill@agriculture.gov.ie
01 6157115 01 6157238	01 6157199	colm.brady@agriculture.gov.ie

