Meeting reviews current prospects for vaccination against equine grass sickness

A MEETING, held at the Animal Health Trust on 11 July 2003, was attended by invited representatives from the Animal Health Trust, the Neogen Corporation, the University of Edinburgh, the University of Liverpool, the Home of Rest for Horses, VIRBAC, the Equine Grass Sickness Fund, the Thoroughbred Breeders Association GS Committee, the Horseracing Betting Levy Board, Newmarket studs and equine veterinary practices.

There is increasing evidence that equine grass sickness may be caused by a toxico-infectious form of botulism involving a type-C Clostridium botulinum toxin that is produced locally within the gastrointestinal tract of affected horses. Following preliminary discussions between the Animal Health Trust and Neogen Corporation, the US based manufacturer of ‘BotVax®B’ (a type-B botulism vaccine for horses), two representatives from Neogen visited the UK to explore the possibility of producing a type-C botulism vaccine for the prevention of equine grass sickness.

At the meeting delegates presented the most up-to-date information on the disease, its impact on horses in the UK, and elsewhere, and the evidence for a causative link with type-C C. botulinum toxin. Subsequent presentations centred round the manufacture of a botulism vaccine, vaccine licensing issues from the UK Veterinary Medicines Directorate and how any future possible vaccine trials might be conducted. Whilst the main aim of the meeting was to inform Neogen, the presentations from leading experts and discussions on relevant issues involved all parties.

The EGSF was well represented and many of the topics under discussion had been, or are currently being, funded by the EGSF. It should be emphasised that the production, trial and licensing of any vaccine will take time before meaningful results will be known. It is still at the exploratory stage but a welcome new development.

Racehorse Transporters Association Ball raises £4,700 for grass sickness research

THE Racehorse Transporters Association Ltd. (RTA) held a very successful dinner dance and charity auction in Newmarket in 2003. RTA members from all over the UK and Ireland attended the event, raising £4,700 for the Equine Grass Sickness Fund.
From the **Chairman**

Jacqueline Stanhope, one of Britain’s leading equestrian artists, painted a beautiful picture of Best Mate for us to use as a Christmas card in 2003. The cards were extremely popular and we are very grateful to Jacqueline for her generous support of the Fund and its aims and to her husband Tom for his help and advice.

We believe that every horse owner should know about the disease. Sadly, there are still many people who lose horses to the disease who have in the past, paid scant attention to the disease and its implications. Every horse or pony that suffers from Grass Sickness renews this committee’s dedication to raising more money for research and we rely on all of you out there to keep this disease talked about. One unfortunate owner who already knew of the disease suffered from a catastrophic cluster in 2003.

If you would like us to include your story on the website, please send it as a Word document.

Please encourage your local Pony Club, Riding Club or Breed Society to be aware of the disease and particularly of the Fund, so that they can turn to us if need be. Please ask them to publish our website address in any circulars that they send out to their members.

We are looking for volunteer collectors to help us with collections at various racecourses around the country. If you live close to any of the 59 racecourses in Britain and would like to help us, please fill in the form on page 10.

During 2003, BBC Scotland’s television crew recorded a feature on grass sickness for their Sunday morning Landward programme. They visited the University of Edinburgh Large Animal Hospital to report on the recent advances and research. It was broadcast in late November but, disappointingly, they made no mention of the EGSF or where horse owners could find information. However, all media coverage raises the profile of the disease.

**Philippa Gammell**

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**Obituary**

**Lady Elisabeth Joicey**

The Equine Grass Sickness Fund has lost one of its most staunch supporters with the death of Lady Elisabeth Joicey. For 9 years, Lady Joicey hosted an annual dressage series at Etal, organised by Elisabeth Brown and a dedicated band of helpers, encouraging young and not so young, experienced and inexperienced competitors to take part, raising thousands of pounds for grass sickness research.

**Philippa Gammell**

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**Thank You**

We would like to thank everyone who supported the Fund at Christmas by making a donation or buying cards and merchandise. We sold a huge number of Christmas cards in 2003, which helped to raise £13,000. Thank you once again to Jacqueline Stanhope without whose generosity we could not have achieved this.

**Moving House?**

Please remember to notify us if you are moving house so that we can update our records and continue to send you the Equine News.

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**Have you visited the EGSF Website?**

Judging by some of your comments the information on our website has been very useful. For those of you who don’t have a computer we are happy to send out information by post.

Visit www.grasssickness.org.uk or Tel: 0131 445 6257
Equine grass sickness: is it a Scottish disease?

Dr Helen McCarthy, Dr Chris Proudman and Professor Nigel French, Epidemiology Group, University of Liverpool

MANY of us, rightly or wrongly, think of equine grass sickness (EGS) as a Scottish disease. As part of a larger project funded by The Home of Rest for Horses we reviewed the literature on EGS in England and Wales to determine how prevalent the condition was outside Scotland. Articles published in veterinary journals, some almost 100 years ago, indicate that EGS has been diagnosed in most counties of England and Wales. Undoubtedly the highest prevalence of disease is in Scotland and the North of England but Kent, Hampshire and Wiltshire have also given rise to EGS cases.

This finding was further supported by recruitment of EGS cases to our study. We invited veterinary surgeons to inform us of cases so that we could administer questionnaires and collect samples from affected premises. The primary hypothesis under investigation was that EGS was associated with the bacterium *Clostridium botulinum*. More of this part of the study in future newsletters! The map accompanying this article illustrates the geographical distribution of cases recruited to the study. Clearly this is heavily influenced by proximity to Liverpool, but it does illustrate the occurrence of EGS, often multiple cases, in the northwest of England and North Wales.

A further part of our study investigated space-time clustering in EGS. Are cases close together in space also close together in time?

By using a novel mathematical technique, first employed to investigate the clustering of human disease outbreaks, we determined that EGS cases are significantly clustered in space and time. Further cases of EGS are more likely to arise within 20 days and a 10km radius of a primary case. Such clustering of disease is typical of infectious diseases (e.g. equine influenza, ringworm) but can also occur where local factors (e.g. soil type, weather) act as trigger factors for disease. The reality of space-time clustering of EGS was brought home to us last summer when grass sickness was diagnosed in a pony living at the Veterinary Teaching Hospital at Liverpool. Within 10 days two further cases had been reported within five kilometres of the hospital in Wirral. The precise cause of space-time clustering of EGS is unknown at present but is another intriguing feature of this disease.

Geographical distribution of grass sickness cases reported to the University of Liverpool in 1999
**The role of Clostridium botulinum type C/D in equine grass sickness**

Bacteriological research by the Microbiological Pathogenesis Research Laboratory at Edinburgh University

THE hypothesis that equine grass sickness is caused by a toxicoinfection of *C. botulinum* type C/D has been investigated at these laboratories since the mid-1990s and several papers have been published reporting the substantial circumstantial evidence supporting it.

Although the hypothesis is rapidly gaining support in the scientific community, hard evidence is still required. This would include fulfillment of certain criteria first formulated by Robert Koch in the 1900s. These criteria are used to prove that a specific type of bacteria causes a certain disease and many aetiological agents of disease have been identified in this way. Over the years the postulates have been modified in order to address advances in medical research. The postulates (called Koch's postulates) are as follows:

1. The organism should be constantly present in affected animals but not present in healthy controls.
2. The organism must be isolated, and then cultivated in pure culture.
3. The pure culture should produce the characteristic symptoms of the disease when inoculated into a susceptible animal.
4. The organism should be recoverable from the experimentally infected animal and cultured again.

Although toxin has been detected from complex, mixed culture, only non-toxigenic strains have been recovered from cases in pure culture, and so the first two postulates have not yet been fulfilled. Why is isolation so difficult? There are three main reasons; fastidiousness of the organism; instability of the toxin gene; size of the equine intestine and amount of intestinal bacteria. *C. botulinum* is strictly anaerobic and unless in its sporulated form, the presence of oxygen kills it. It is also highly fastidious (need lots of nutrients when in culture). Unfortunately these nutrients allow other bacteria present in the samples to grow prolifically, either masking the presence of *C. botulinum* type C/D and/or inhibiting its growth. Due to the extreme sensitivity of the horse to botulinum neurotoxins, the hypothesis suggests that grass sickness is caused by very low numbers of organisms releasing toxin over a (unknown) period of time. The incubation period of the disease is also unknown, so it is not at all certain that the organism is still present when the animal is showing clinical signs. The gene that encodes the neurotoxin of *C. botulinum* type C/D is encoded on a bacteriophage (a virus that infects bacteria). This bacteriophage can be lost during the bacteria's growth cycle.

When considering the size of the equine small intestine and the estimation that half the dry weight of equine faeces consists of bacteria-we face similar odds as we would of finding the proverbial needle in a haystack!

**Motile**

Where do we start? The shape of *C. botulinum* cells is well characterised; they are slightly curved, rod-shaped organisms that are observed in short chains when viewed under the microscope. They are often motile and have spores at one end of the rod (called sub terminal spores). Various stains are used to identify bacteria and most bacteria are either Gram positive (purple when using Gram’s stain) or negative (pink). However, *C. botulinum* is Gram-variable and can either be all pink, all purple or varying mixtures of both.

*C. botulinum* type C/D (and the non-neurotoxic variant *C. novyi* type A) is unique among botulinum types in that they produce (among others) two enzymes,
lecithinase and lipase. Other botulinum types produce only one of the two, lipase. Samples are incubated anaerobically for five days, during which time dilutions of this enriched culture are inoculated onto agar plates. The agar used has been chosen for two reasons; it contains the nutrients required by *C. botulinum* type C/D to grow and because it shows up the effect of lipase and lecithinase (fig.1). Lecithinase shows as opaqueness around the bacterial colonies in the egg yolk emulsion medium and is produced by many species of bacteria. Lipase has a pearlescent effect that just covers the colony’s surface (difficult to see on film!). On agar containing blood (fig.2), a zone of clearing is produced caused by an enzyme called a haemolysin (also produced by many bacterial species), and swarming is also sometimes seen (where the bacteria ‘move’ across the plate).

If likely looking colonies are isolated then they are grown up to test for toxin production by ELISA, toxin gene detection by PCR and biochemically profiled by sugar fermentation tests and gas chromatography.

Due to a very welcome and important boost in funding, providing money for more workers, we are presently making a concentrated effort in isolating the organism. We are focusing our sampling technique, targeting acute cases and sampling the length of the equine small intestine and therefore maximizing our chances of finding toxigenic strains. Different growth media and isolation procedures are being assessed for their support of *C. botulinum* type C/D growth, toxin production and greatest recovery of the organism. All of this work must first be optimised using pure cultures of laboratory strains of the organism. Then work will go on to use faeces spiked with the laboratory strains. Finally, after all of this, work will begin on clinical samples. Molecular techniques will also be revaluated and new methods tried. In the meantime, serology and investigation into botulism and dysautonomias of horses and other species continues, providing valuable data supporting the toxicoinfection hypothesis.

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**Burlington Bertie’s Trip to Newmarket**

DENISE HEWETT brought her horse, Burlington Bertie, to the National Stud Fair at Newmarket in July, 2003 to be a part of the Equine Grass Sickness Fund exhibit. Only one year before Bertie had been fighting for his life with chronic grass sickness but now looked healthy and full of mischief. So full of mischief that when he was taken to his pen on the first day he deliberately went round undoing all the string which attached the EGSF banner to the pen. As soon as it was tied up he went back and undid it again! Denise was worried that he might get stressed as there was a lot going on around him, but within a couple of hours he had settled down and was enjoying all the attention.

As Denise had a serious riding accident 4 years ago, which left her with 5 broken vertebrae, Bertie was ridden in the display in the main arena each day by his regular partner Denise Rooke, who showed him off to his best despite the blistering heat.

Mrs Philippa Gammell, Dr Elspeth Milne, Miss Philippa Gillie and Joyce McIntosh took turns to man the EGSF stand and answer many questions, while Denise talked about Bertie’s nursing and recuperation.

Denise Hewett said “I was very surprised by the number of people that had kept horses for years but had never heard of EGS or still think it is Laminitis. If we have helped to make a few more people aware of the disease it was well worth all the hard work over the 3 days.”

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Differential protein expression in autonomic ganglia in relation to equine grass sickness

AFTER graduating from the University of Glasgow with a BSc (Hons) in Neuroscience, I began searching for a challenging career path. Equine Grass Sickness struck a chord since Twinkle, my first pony, had tragically died of equine grass sickness when I was twelve years old.

Now, I have returned to Glasgow University, embarking upon my second term of an MSc by Research studying “The Differential Protein Expression in the Autonomic Ganglia of Horses with Respect to Equine Grass Sickness (EGS)”. This project is part funded by the EGSF.

One of my first tasks was to carry out a comprehensive literature search covering scientific papers about both grass sickness and protein analysis (proteomics) before starting on the laboratory work. The next task was to familiarize myself with the laboratory, its day-to-day running and the equipment I would be using.

What is Equine grass sickness?

Equine grass sickness (EGS) is an often-fatal disease of the horse with clinical symptoms that indicate autonomic nervous system dysfunction. Such symptoms include varying degrees of colic, intestinal stasis, dysphagia, anorexia, weight loss, tachycardia, excessive salivation, patchy sweating, ptosis (drooping of the eyelids), a dry nose and muscle tremor. A characteristic loss of stainability (chromatolysis) is commonly seen in neurons of the gut wall plexi, prevertebral and paravertebral ganglia, the intermediolateral tracts of the spinal cord and certain brain stem nuclei in EGS cases.

The disease is recognised in three loosely defined clinical categories: acute (disease duration 1-2 days), sub-acute (2-7 days) and chronic (>7days). It is hypothesised that a neurotoxin is ingested and the extent of the nervous damage is dose dependent. It is also considered that massive neuronal loss likely results in the acute form, while less neuronal damage results in less severe signs and the chronic form of the disease.

Trigger

The aetiology of EGS is unknown but the current hypothesis is that it is a toxico-infection with the bacterium Clostridium botulinum type C. The bacterium is often detected in the faeces and ileum of horses with EGS. Dietary factors, such as cyanide from white clover, may act as a trigger for the bacterium.

What is the problem?

A protein has been detected in the serum of horses with EGS, which is capable of inducing autonomic neuropathology when administered either intraperitoneally or directly into the parotid salivary gland. Little is known about this neurotoxin despite previous attempts to identify it. It is possible that the protein could represent botulinium toxin, possibly associated with a protein carrier (e.g. albumin), but may be unrelated.

An investigation by Emily Peaston

What do we hope to achieve?

The aims of this investigation are to compare the protein expression in homogenates of cranial cervical ganglia collected from horses with acute EGS and from control horses. Cranial cervical ganglia were chosen because they consistently display a high proportion of affected neurons in EGS. Horses with acute grass sickness were selected in order to increase the chances of identification of the candidate neurotoxin. It is hoped to (1) identify a protein toxin, which is responsible for neuronal death in EGS, and (2) supply crucial information about the mechanisms of neuronal death and protection in EGS.

How are we going tackle the problem?

Proteomics is the systematic analysis of protein expression patterns in tissues. It involves the isolation, separation, identification and functional characterisation of the proteins in an organism. Two-dimensional gel electrophoresis (2-DE) offers greater protein resolution potential than any other current separation method. It is also useful for the identification of changes in protein expression i.e. changes in the amount being produced.

Ganglia will be homogenised and the component proteins separated by high-resolution 2-DE. An example is shown in Fig 1. Quantitative comparison of each of the protein ‘spots’ in ganglia homogenates from EGS and control horses will be carried out using
laser densitometry. Protein ‘spots’ that are consistently larger or smaller in EGS compared with control samples will be removed from the gels and the proteins identified by comparison against the fingerprints of all known protein sequences. The identity of candidate proteins for which there is no published sequence will be further investigated, and a primary protein sequence deduced for them by comparison with primary sequences of published proteins from the horse and other species.

**Foreseeable problems we might encounter**

- Identification of the target proteins may prove difficult, as little sequencing has been carried out on equine proteins; thus, there are limited resources available for comparison of primary sequences.
- Preparation of samples may cause difficulties given that during homogenisation enzymes, which break down proteins, may be liberated. Careful selection of preparation techniques and protease inhibitors will be required to prevent the degradation of proteins within the sample.
- The natural genetic variation between different breeds of horse may make identification of a protein that is disease related difficult.

This work is now finished and a final report will be produced for the next edition of the Equine News. I would like to thank the Equine Grass Sickness Fund for their support and guidance; I would not have been able to embark upon this fantastic project without them.

**Figure 1.** 24cm, 2D gel, pH 4-7 of autonomic ganglia.
TREATMENT options for acute and sub acute cases of equine grass sickness (EGS) are limited and all acute and most sub acute cases are euthanased on humane grounds. However, some chronic cases will survive with appropriate nursing and symptomatic treatment but case selection on the suitability of horses for treatment is important.

A pilot study was carried out to find out how many practitioners are willing to treat EGS cases in practice, the treatment regimens adopted and the success rates achieved. A questionnaire was sent to 70 general practitioners throughout Scotland, of which 36 replied. An equal number were from the west and the east coast. The questionnaire consisted of 8 questions relating to the diagnosis and treatment options for EGS. These covered the number of cases seen per year, how many were acute, sub acute or chronic, and the numbers treated or referred to a hospital. The questions also covered the means of determining the horse’s suitability for treatment, treatment regimens used, survival rates and the diagnostic criteria the veterinarians used. A comparison of these results was made with the results for the Large Animal Hospital of the Royal (Dick) School of Veterinary Studies (R(D)SVS) in Edinburgh in 2001. The main findings are described in this article.

Category of disease

The percentages of the classes of EGS are shown in Figure 1. The high number of acute cases referred to the R(D)SVS could be due to the difficulties in differentiating these from surgical colic and the high number of chronics due to the interest of the R(D)SVS in receiving chronic cases.

Decision to treat

Ability to swallow and expense to the client were the most common considerations. Other criteria included distance from a referral centre, owner experience or request, presence of gastric reflux and results of rectal examination (Figure 2).

Treatment regimen

Flunixin was by far the most commonly used analgesic with 15 of the 36 practitioners using it. Phenylbutazone was also used, as was butorphanol. Cisapride was the commonest gastrointestinal stimulant used and liquid paraffin was often used as a lubricant. The most commonly used appetite stimulant was vitamins but brotizolam, electrolytes, acepromazine, milk and betamethasone were also said to have been used for this purpose. Other forms of treatment included providing a variety of foodstuffs and TLC! No general practitioners had the facilities to nurse grass sickness patients so it was done solely at owners’ premises.
Outcome of treatment

The average percentage of horses’ euthanased after the start of treatment was 46%. This would suggest a 54% success rate. However, if the practitioners that don’t treat are excluded, the actual success rate is only fractionally lower at 41%. The R(D)SVS was higher at 82%, possibly due to the intensive nursing care available.

The average time to the end of treatment was 1.6 months but this varied from 1-6 months. The most common residual sign was a failure to gain weight. Notes on recovery varied, with some practices being positive about recovered grass sickness cases and others stating that they are seen to be poorer horses that are of not much use to the owners. One vet alleged that in 30 years in practice they had not seen a case of grass sickness survive, a statement that has definitely not been reflected in this study! Other vets are of the opinion that the quality of nursing care has the biggest effect on survival and medication has a minimal impact on overall success.

There is a mixed opinion about treating grass sickness cases in practice and a lot has got to do with economics and distance from a referral centre. The overall view of treatment is that it is purely symptomatic. The main influence on survival is nursing care, which is highly variable in general practice and depends on client dedication. As for success rates, a reasonable success is being achieved in practice. Obviously this is a frustrating disease and until the cause is known, little more treatment can be done. There is certainly no successful regimen and each case should be assessed on its own merit.

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The average time to the end of treatment was 1.6 months but this varied from 1-6 months. The most common residual sign was a failure to gain weight. Notes on recovery varied, with some practices being positive about recovered grass sickness cases and others stating that they are seen to be poorer horses that are of not much use to the owners. One vet alleged that in 30 years in practice they had not seen a case of grass sickness survive, a statement that has definitely not been reflected in this study! Other vets are of the opinion that the quality of nursing care has the biggest effect on survival and medication has a minimal impact on overall success.

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RIDERS came from near and far to support my charity ride on 1st November. The weather was great. The views and colours of autumn in the Langendale Valley were well worth the effort put in by riders and helpers alike. A total of 82 people enjoyed the 15/22 mile route along the Transpennine Trail and the southerly part of the Pennine Bridleway. The amount raised was £645.40, which was met pound for pound by Barclays Bank. The total raised for grass sickness research was £1290.80.

Ann Pomfret

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**Fundraising at the races**

I would be willing to help with fundraising at

Name of racecourse(s) ...............................................................

Can you help on weekdays □ weekends □ (please tick)

I would be willing to help with general fundraising in my area. Please send me details □

Name (Please print) ...............................................................

Address ..............................................................................................
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Postcode..................................................

Tel. no:........................................... e-mail ..........................................................................

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**Please complete and return this form to:**
The Secretary, Equine Grass Sickness Fund, Moredun Foundation, Pentlands Science Park, Penicuik, Midlothian, EH26 0PZ, UK
**Greenacres Equestrian Charity Event**

A SHOW jumping demonstration by Pennie Cornish and Phillip Miller at Greenacres Equestrian Centre, Harpenden, delighted a packed house and raised £10,000 for charity. Desi Dillingham compered the evening while Pennie and Phillip put two groups of riders through their paces before giving a sparkling performance on their own horses, Estranged and Masterlock.

The event was Pennie’s idea as she had lost her stepfather, Peter Woor, to leukaemia some years ago and she and her mother Di like to raise money every year. Three charities benefited from the event. They were Peter Woor Memorial Fund for leukaemia research, Cancer Research UK and the Equine Grass Sickness Fund.

The EGSF would like to record their thanks to Pennie, Di, Phillip, and Desi, to all who made donations and to the sponsors which included F&C Management, Ocado, Vienna Homes and Chiltern & Thames Rider.

**Nursing changes**

Kay Adams, ILPH sponsored grass sickness nurse, who took over nursing duties from Katy Hayward.

**Presentation to Jean Robb on her Retirement**

Chairman Philippa Gammell presents Miss Jean Robb with a framed print to mark her retirement from the EGSF committee after many years of research and work on the Fund’s behalf.

**Fundraising at Huntingdon Races**

Collections were taken at Huntingdon Racecourse in 2002 and 2003. Coinciding with Best Mate’s seasonal reappearance (on both occasions) these collections were successful. Our thanks to John and Margaret Barker and to Denise Hewett, her family and friends for all their hard work and enthusiasm.

Philippa Gammell

**Merchandise**

Merchandise and cards are available throughout the year at the events that we attend and on our website. All proceeds from the sale of merchandise go directly to the Fund.

**OUT & ABOUT 2004**

The EGSF will have a stand at: the Scottish Equine Fair at Ingliston, near Edinburgh on 30-31 October.
We acknowledge the generous donations received from the following:

<table>
<thead>
<tr>
<th>Donations Received</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Animed Veterinary Hospital</td>
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<td>McCash’s Country Stores</td>
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<td>Extr-Ordin-Air</td>
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<td>Horse &amp; Pony Rescue Society</td>
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<td>A M Pilkington Charitable Trust</td>
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<td>Mad About Horses</td>
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<td>Ashworth Vet Group</td>
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<td>Liz Henderson’s collection</td>
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<td>Buchan Riding Club</td>
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<td>BHS Cumbria AGM collection</td>
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<td>TopSpec Equine Ltd</td>
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<td>Millers Country Store, Fordel</td>
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<td>Equine Veterinary Hospital, Arundel</td>
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<td>BHS Borders</td>
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<td>Estate of the late Miss Mary Graham Duff, MRCVS</td>
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<td>Mainhouse Charitable Trust</td>
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<td>Harrogate Bridleways Association</td>
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<td>The Welsh Pony and Cob Society</td>
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<td>Emmerson Family – in memory of Whizzy</td>
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<td>The Scottish Welsh Pony and Cob Association</td>
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<tr>
<td>Goodwood Arab Race Day - Micaela Dinnage</td>
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<td>Mrs Denise Hewett’s collection</td>
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<td>Mad About Horses</td>
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<td>Merlin Veterinary Group</td>
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<td>Liz Henderson’s collection</td>
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<td>Linlithgow Bridge PO</td>
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<td>Seaforth Saddlers</td>
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<td>Kirriemuir Horse Supplies Raffle</td>
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<td>Central Scotland Highland Pony Club Quiz Night</td>
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<td>BHS Scotland EGS Talk</td>
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<td>The staff at scarsdale Veterinary Group</td>
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<td>Highland Pony Society England &amp; Wales Raffle</td>
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<td>Moray Coast Vet Group</td>
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<td>Presents Galore Event in Kelso which raised the wonderful sum of £2,800</td>
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<td>‘Dick’ Vet Disco - Debbie Henderson and Irene Allan £1,000</td>
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<tr>
<td>Greenacres Equestrian Charity Demonstration - Mrs D Woor and Penny Cornish who raised £2,000</td>
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<td>Etal Dressage Series 2002, The late Lady Joicey and Mrs Elisabeth Brown, which raised £1,000</td>
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<tr>
<td>Grass Sickness Charity Show run by Janice Haggarty and family, Ayrshire, which raised £875</td>
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<tr>
<td>Gleneagles Equestrian Christmas Show which raised £600 and was matched by Diageo Foundation</td>
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<tr>
<td>Jayne Spink who completed the Great North Run in 2hrs 30mins and collected sponsorship of £275</td>
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<tr>
<td>Rudwick Riding Club who donated £175 while visiting the Equine Veterinary Hospital, Arundel</td>
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<tr>
<td>Cowslip Bear Company - Christine Adolph who donated £225 and a mohair bear</td>
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<td>Mrs Cath Vaughan and daughter whose sponsored walk raised £234</td>
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<td>BettnStan’s Show - Mr S Bull, Aveley - a new event which raised £756.50</td>
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<td>Trench Villa Stables whose livers donated £110.00 in lieu of sending Christmas cards</td>
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<tr>
<td>Natasha and Tina, Ashworth Vet Group who raised £51 by running a Handy Pony Competition</td>
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<tr>
<td>Brenda Adams and Friends whose 3 day Megget Ride raised £343.36</td>
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<td>(Sadly, one of the horses which took part was diagnosed with cancer soon after the ride and had to be put down)</td>
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Lack of space prevents us from listing all fundraising donations but we will include more in the next Equine News

<table>
<thead>
<tr>
<th>Donations Received</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Aveley Charity Horse Show - Ms Laura Hatchcliffe</td>
<td>£100</td>
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<tr>
<td>Racehorse Transporters Association Ball</td>
<td>£4700</td>
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<tr>
<td>Avonvalley Tidy Memorial Show 2003</td>
<td>£800</td>
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<tr>
<td>Sara Jane Cook’s Marathon Run</td>
<td>£535</td>
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<tr>
<td>Scholland Equestrian Centre, Fife</td>
<td>£259.23</td>
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<tr>
<td>Kincardineshire Pony Club Talk</td>
<td>£290.97</td>
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<tr>
<td>Miss Lloyd-Owen’s 2 Plant Sales</td>
<td>£225</td>
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<tr>
<td>CSHPC Stud Visit</td>
<td>£105</td>
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<tr>
<td>Arnie’s Fund</td>
<td>£245.74</td>
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<tr>
<td>J &amp; D Hewlett’s collection</td>
<td>£93</td>
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<tr>
<td>British Connemara Pony Society Raffle</td>
<td>£86</td>
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<tr>
<td>South Lammermuir Riding Club Show</td>
<td>£448</td>
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<tr>
<td>Liana Ballingall - Zara’s 21st Birthday Party</td>
<td>£75</td>
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<tr>
<td>Seaforth Saddlers</td>
<td>£285.05</td>
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<tr>
<td>Hexham Native Horse and Pony Show Raffle</td>
<td>£157</td>
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<tr>
<td>Car Boot Donation - Jane Bates</td>
<td>£57.20</td>
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<td>G J W Timms Ltd</td>
<td>£350</td>
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<tr>
<td>Northumberland Foal and Yearling Show</td>
<td>£250</td>
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<tr>
<td>Borders and Scottish Counties Connemara Lunch</td>
<td>£254</td>
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<tr>
<td>Hexham Native Horse and Pony Show which raised</td>
<td>£184</td>
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<tr>
<td>Nigel and Sue Cowgill - Nigel’s Guitar Session</td>
<td>£150</td>
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<tr>
<td>BHS Grampian Panel Evening</td>
<td>£149.14</td>
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<tr>
<td>Jeni Birks – 3 photos show which raised</td>
<td>£275</td>
</tr>
</tbody>
</table>

We would also like to thank, most sincerely, those of you who have made personal donations to the Fund.

If you require further information about the Fund, please contact
Joyce McIntosh, Secretary, Equine Grass Sickness Fund,
The Moredun Foundation, Pentlands Science Park, Penicuik, EH26 0PZ
t. 0131 445 6257 f. 0131 445 6235
or visit our website at www.grasssickness.org.uk