

Animal Aid  
mad science  
Awards  
2003



# They don't spare the horses



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*Animal Aid's Mad Science Awards (AAMSAs) - handed out each August for pointless and grotesque scientific research - never fail to embarrass the animal research community because of what they reveal to an incredulous outside world.*

*The focus this year is on 11 horse experiments conducted by research teams working in 14 establishments - including university departments, a pharmaceutical company and even a leading veterinary charity.*

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Welsh mountain pony - a commonly exploited laboratory 'tool'.

# Introduction

The Mad Science Award winners' own accounts, published in veterinary and other scientific journals, describe how – among other torments - healthy horses were deliberately fed mouldy hay, subjected to leg wounds that took weeks to heal, walked on treadmills in experiments that lasted months, injected with chemicals that caused pain and inflammation, and made pregnant then infected with a virus that resulted in abortion. Another pregnancy experiment involved the implantation of thoroughbred embryos into much smaller ponies and vice versa. Foals who were incubated in ponies were born with horribly deformed legs and muscle wastage.

Some of the experiments ended with the 'equine models' being killed and cut up for analysis.

The justification invariably offered for such 'procedures' is that they help a very large number of horses and so it is right to sacrifice the few for the many. Animal Aid's view is that no animal, or group of animals, should be deliberately harmed in an attempt to advance the health of another group of animals - just as we would oppose invasive experiments on any group of people for the supposed 'greater good'. It might be less convenient for researchers to develop surgical techniques and drugs by collecting data from horses suffering naturally-occurring sickness and injuries, but we regard this as the only humane and civilised option. Equally, data obtained from horses in a 'real-world' environment will often be far more valuable than that extracted from equines held captive in an artificial setting.

It can also be said of the 'greater good' argument, that while any horse – no matter how he or she is used – can get sick and injured, it is always low-value horses who are the

experimental victims. Often they are little Welsh Mountain ponies – of no use to the racing industry or the point-to-point set. Expensive new drugs, innovative surgical methods and novel reproductive techniques are not developed with 'low-grade' moor, mountain or New Forest ponies in mind. The target market are owners of 'quality' horses, not least the thoroughbred racers who were the subject of Animal Aid's special report, **Riding For A Fall: the genetic timebomb at the heart of racing**.

Published in April 2003 and based on scientific papers, industry data and commentaries by leading racing insiders, **Riding For A Fall** revealed that modern race horses are subjected to such extreme patterns of profit-driven in-breeding, training and competition that their fundamental well-being is under threat, and with it the very foundations of the racing industry.

Yet rather than confront the endemic problems that lead to thousands of horses every year failing to

make the grade and hundreds more dying from race-related injuries and disease, the industry is looking for 'answers' through grotesque laboratory experiments on live horses.

The parlous state of the modern thoroughbred was described recently by a leading *Racing Post* columnist: 'Many learned students of this sport think the creature on which it all depends may now be in decline. Their disturbing contention is that excessive in-breeding for speed, as well as breeding to horses whose congenital defects may have been masked by so-called 'medications', has turned, or is turning, the thoroughbred ...into an increasingly fragile and vulnerable creature that is having ever greater trouble meeting the demands we place on it.'

(*Racing Post* columnist Paul Haigh, October 31, 2002)



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Top trainer, Ian Balding, gave his own informed view of the crisis facing the industry when he told *Racing Post*: 'The fashion now is for speed and more speed. We have gradually lost [the] strength, stamina and durability, temperament, extra bone and courage that those horses have. If we carry on like this, then slowly but surely we are ruining the breed.'

('Decline of the Thoroughbred breed', *Racing Post*, October 12, 2001)

The fear now among racing traditionalists is that the application of the new genetic and reproductive technologies will result in an even greater burden on the modern race horse. At present, racing authorities around the world ban the use of techniques such as artificial insemination and embryo transfer. They insist that mares be 'covered' by stallions in the old-fashioned way.

But one of our 2003 Mad Science Award winners - in fact, he claims a total of three 2003 AAMSAs\* - has gone on record calling explicitly for an end to the AI ban. He is Professor William 'Twink' Allen, director of the Thoroughbred Breeders' Association's Equine Fertility Unit - a registered charity based at Cambridge University in Newmarket. Allen produced the world's first test tube horses, has conducted embryo transfer experiments and told a House of Lords Select committee hearing last February that he is also keen to get to work on horse cloning. (February 5, 2002 before the House Of Lords Select Committee on Animals In Scientific Procedures)

Another of Allen's enthusiasms is a project to map the genome (or genetic composition) of the thoroughbred horse. Allen - who is father-in-law of jockey Frankie Dettori - claims that the project will enable bad traits to be bred out and thereby open the way for the busting of the ultimate taboo - the mating of stallions with their own daughters, and brothers with their sisters. A geneticist at the Animal Health Trust (AHT) - a veterinary charity also based in Newmarket and a winner of no less than

four 2003 Mad Science Awards\*\* - is the leader of the equine mapping project. Allen's team provides the AHT with animal tissues. The AHT's work, says Allen, is proceeding 'way ahead of the rest of the world'. ('Revolutionary ambitions of improving the breed with a genetic map of horses', *Racing Post*, February 18, 2003)

Confirming that the mapping project is, at least, to some extent about producing better performing animals for the racing industry, Allen told *Racing Post* in February this year: '...if the map can tell you, "Boy that mare's got some bloody good speed genes", you say, "OK, let's make sure we fix that into that family".'

Animal Aid's concern is that such developments will not only generate a great deal of painful research on horses but will lead to yet more pressure on racing animals - which, in turn, will generate more experiments aimed at fixing the problems produced by those same technologies.

The horse, like the dog, cat and monkey, is supposed to have an elevated status under the Home Office animal experimentation licensing system. 'Special justification' is required from the licence applicant in all cases where horses are intended to be used. The research projects that win our 2003 Mad Science Awards show that the system is marked by anything other than rigour, compassion and logic.

#### **Andrew Tyler, Director of Animal Aid**

\*See Experiments 5,6,7 \*\* See 1,2,4,9



# Mad Science Winners 2003

**1. Animal Health Trust, Newmarket, Cambs; University of Cambridge, Department of Clinical Veterinary Medicine; Royal Veterinary College, North Mymms, Hatfield, Herts.**

To study cartilage damage caused by strenuous exercise, 12 young female thoroughbreds were exercised - gently or hard - for 19 weeks, during which time they were kept indoors. All 12 were then killed and their lower legs sawn off for analysis. It is particularly chilling that the Animal Health Trust - a leading veterinary charity - should engage in experiments whose 'endpoint' is the killing of 12 perfectly healthy young horses. There is, after all, no shortage of horses to study post mortem - animals with healthy as well as damaged cartilage. According to a Jockey Club survey, 657 died between 1996 and 1998 as a direct result of injuries sustained on British race courses. There are literally thousands of additional equine fatalities every year in Britain, from whom data can be obtained.

Equine carpal articular cartilage fibronectin distribution associated with training, joint location and cartilage deterioration. Murray RC, Janicke HC, Henson FM, Goodship A. *Equine Vet J* 2000 **32** (1) 47-51

**2. Animal Health Trust, Newmarket; Queen Mary and Westfield College, University of London; Department of Clinical Sciences, Kansas State University, USA; Royal Veterinary College, University of London**

Many young racehorses suffer lameness due to the way they are in-bred, trained and raced. In order to mask the pain and swelling so that the animals can continue with their race schedule rather than being allowed to rest and recover, steroids are often injected into their inflamed joints. This is despite evidence that the steroids weaken the bones and predispose them to fractures.

This experiment was designed to test how a commonly-used steroid affects bone structure. Eight two-year-old female thoroughbred horses were injected with the steroid 16 times and exercised on a treadmill for 13 weeks before they were killed.

The experiment suggested that the steroid does not adversely affect bone structure in the ankle joint after all. But the researchers neglected to examine whether the cartilage was affected and so they advocate further studies, which would kill yet more horses. This is despite their paper citing five previous published studies of the effects of

steroids on cartilage composition in horses. Once again, there is no allusion to the obvious resource of the many horses killed during racing and training. The lead researcher was from The Animal Health Trust.

The effect of intra-articular methylprednisolone acetate and exercise on equine carpal subchondral and cancellous bone microhardness. Murray RC, Znaor N, Tanner KE, DeBowes RM, Gaughan EM, Goodship AE. *Equine Veterinary Journal* 2002 **34** (3):306-310

**3. University of Cambridge, Department of Veterinary Medicine; University of Sydney, Department of Veterinary Clinical Sciences, Camden, Australia**

This experiment was carried out jointly between the Universities of Cambridge and Sydney. Eight horses were subjected to full-skin-depth 2.5cm-square wounds to the back of both their front legs.

The wounds were observed while they healed, which took between 45 and 87 days. One leg was treated with Solugel, while the other was untreated. The horses were anaesthetised while the skin was cut, but deep open wounds can be painful for a long time after the initial event.

There can surely be no credible justification for assessing a potential new wound treatment by deliberately injuring horses, rather than by embarking upon a clinical trial on animals presenting with accidental wounds. There is no shortage of horses wounded by jumps and fences during competitions, and through everyday riding accidents. Potentially helpful treatments should be tried on such animals.

Effects of 25% propylene glycol hydrogel (Solugel) on second intention wound healing in horses. Dart AJ, Cries L, Jeffcott LB, Hodgson DR and Rose RJ. *Veterinary Surgery* 2002 **31**:309-313

**4. Animal Health Trust, Newmarket**

Five horses were subjected to a whole series of procedures in this bizarre experiment, in which they were restrained in stocks for 70 minutes, while breathing through a face-mask and simultaneously having their blood sampled and monitored via catheters implanted in their jugular veins and carotid arteries. 5cm of their carotid arteries had been translocated surgically to an accessible position under the skin a year before these experiments started.

The aim was to measure the horses' response to low levels of oxygen - but why? Nowhere in the paper is any plausible justification offered for such a study, other than vague and not very credible suggestions that it might be relevant for people with chronic lung disease. The authors themselves acknowledge that 'the response to hypoxia has been reported to be highly variable between species'.

They conclude that their results were inconclusive and so recommend further studies using greater numbers of horses and a longer period of hypoxia (oxygen starvation).

Endothelin in the equine hypoxic pulmonary vasoconstrictive response to acute hypoxia. Benamou AE, Marlin DJ and Lekeux P. *Equine Veterinary Journal* 2001 **33** (4): 345-353

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**5. University of Cambridge, Equine Fertility Unit, Newmarket, Cambs; Babraham Institute, Babraham, Cambs; and University of Cambridge, Department of Physiology, Cambs**

Nineteen mares were subjected to embryo transfer, involving the implantation of thoroughbred embryos into much smaller ponies and vice versa. Two mares aborted and the foals of two others were stillborn. One pregnant mare was killed when she broke a leg. The thoroughbred foals who were incubated in ponies suffered muscle wastage and freakishly long and malformed legs and hooves: their ankles were bent right over on the ground. The paper did not consider whether such a condition is painful for the foals. It was claimed that the project would advance understanding of human illness.

The lead author is Professor William 'Twink' Allen, director of the Thoroughbred Breeders' Association's Equine Fertility Unit in Newmarket. Allen (see introduction) is a keen advocate of high tech equine reproductive methods such as test tube births, embryo transfer, cloning and genomic-based breeding.

Allen and the other authors seek to justify the experiments by suggesting that horses can make a good model for the study of the foetal origins of adult disease in humans. There are indeed indications that impaired growth in utero may increase adult hypertension, heart disease and metabolic disorders - but the idea that thoroughbred embryos transplanted into ponies can contribute to such demanding human clinical and epidemiological research is not remotely credible.

The influence of maternal size on placental, fetal and

postnatal growth in the horse. Allen WR, Wilsher S, Turnbull C, Stewart F, Ousey J, Rossdale PD, Fowden AL. *Reproduction* 2002 **123**, 445-453

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**6. University of Cambridge, Departments of Physiology and Clinical Veterinary Medicine**

Eight thoroughbred and seven pony mares were artificially inseminated, following ovulation-inducing hormone injections, to produce 'normal' pregnancies. Twenty six further mares (13 donors and 13 recipients) were used to establish 'between-breed' pregnancies; eight 'thoroughbred-in-pony' and five 'pony-in-thoroughbred'. On the day the foals were born, they all had a jugular vein catheter inserted under local anaesthesia. At six days of age, a drug was infused via the catheter to induce a sharp drop in blood pressure. The foals' heart rate and stress hormone (adrenaline) levels were measured over the 40-50 minute duration of the experiment.

The 'between-breed' foals' responses were different from the normal (pony-in-pony or thoroughbred-in-thoroughbred) foals' responses. This demonstrates that both growth restriction (thoroughbred-in-pony) AND growth enhancement (pony-in-thoroughbred) in foetal life can affect cardiovascular function (regulation of blood pressure) and hormonal responses to stress after birth and, possibly, in later life.

The authors then go on to claim that these findings have implications for people and for the 'foetal origins hypothesis' of the onset of degenerative diseases in adulthood. To suggest that anomalies caused by swapping embryos around in horses can usefully inform human medicine is absurd, as would be any attempt to justify these experiments on such a premise.

Postnatal cardiovascular function after manipulation of fetal growth by embryo transfer in the horse. Giussani DA, Forhead AJ, Gardner DS, Fletcher AJ, Allen, WR, Fowden AL *Journal of Physiology* 2003 **547.1**, 67-76.

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**7. University of Cambridge, Equine Fertility Unit; Royal Veterinary University, Department of Clinical Studies, Copenhagen, Denmark**

Seventy four mares were used in this experiment, the aim of which was to find the cheapest way to inseminate the maximum number of mares with the minimum amount of expensive thoroughbred stallion semen. The researchers were very pleased that a little semen - particularly valuable sex-selected semen for racehorses - can be made to go a long way by using this method of artificial oestrus - induction and insemination in mares.

Seven of the mares were shot, the paper reports casually, after insemination and their reproductive tracts removed immediately for examination. The authors justify this by explaining that the ponies were 'destined for slaughter during annual culling of the experimental herd'.

Funded by The Moller Trust, The Horserace Betting Levy Board and The Thoroughbred Breeders' Association.

Hysteroscopic insemination of small numbers of spermatozoa at the uterotubal junction of preovulatory mares. Morris LH, Hunter RH and Allen WR. *Journal of Reproduction and Fertility* 2000 **118**, 95-100.

#### 8. University of Edinburgh, Wellcome Trust Centre for Research in Comparative Respiratory Medicine, Roslin

Thirteen horses were subjected to a variety of stressful procedures in order to arrive at a conclusion that was immediately obvious and well-known to anyone with any knowledge of horses, without the need for invasive experiments.

Seven of the horses were susceptible to heaves (chronic obstructive pulmonary disorder) and six were healthy controls. Vulnerability to heaves was confirmed by confining all the horses in a stable with the doors and air vents closed and feeding them hay, some of which was mouldy.

The aim of the experiment was to determine the level of potentially irritant airborne bacterial particles horses can endure before triggering an attack of heaves. The horses had to be sedated in order to wear an airtight facemask, through which they were dosed with aerosols containing bacterial particles typically found in mouldy hay and straw. Blood samples were taken from an artery plus the jugular vein, and lung secretions were collected by a tube pushed down the windpipe (without anaesthetic). Responses included coughing, nasal discharge, lung inflammation, dysfunction and mucus secretion.

The earth-shattering conclusion was that dusty, ill-ventilated stables can induce inflammation of the lungs even in healthy horses, but more readily in horses predisposed to heaves. These ill effects can be minimised by good ventilation and hygiene (no mouldy hay/straw) in stables!

The authors made repeated suggestions that their experiment is of relevance to human asthma sufferers, even though they themselves point out that many of the symptoms of interest (chest tightness, headaches, joint pains and tiredness) clearly cannot even be detected in horses.

Pulmonary and systemic effects of inhaled endotoxin in control and heaves horses. Pirie RS, Dixon PM, Collie DD, McGorum BC. *Equine Veterinary Journal* 2001 **33** (3) 311-318.

#### 9. Animal Health Trust, Newmarket, Cambs; Imperial College London, Department of Biological and Medical Systems

Six thoroughbred horses were made to stand in stocks while catheters were inserted into both left and right jugular veins under local anaesthesia. Different concentrations of adrenaline were infused into their blood stream to cause the horses to sweat (through anxiety?) and blood samples were taken repeatedly during the procedure. Injecting the hormone often caused muscle tremors in the animals. An area of skin on the neck and another on the hindquarters was shaved and fitted with a plastic device glued to the skin to record sweat production. Skin temperature, rectal temperature and heart rate were also recorded. The results showed that higher concentrations of adrenaline increase the rate of sweating up to a peak where the sweat glands appeared to become saturated. But, because horses can sweat much more heavily during exercise, the authors deduced that sweating in horses must be controlled by factors (nervous system) other than just hormonal effects. Apart from vague references to sweating responses in man and goats, the authors never attempted to explain the purpose of their experiment, which is certainly hard to fathom. The only clue is that the project was funded by the immensely wealthy race horse owner, Sheikh Mohammed bin Rashid Al Maktoum, as well as the Hong Kong Jockey Club - raising the fear that science may be used to manipulate horses' sweating responses in an attempt to extract higher performance levels from them - not least in oppressively hot and humid climates.

Quantification of the response of equine apocrine sweat glands to beta2-adrenergic stimulation. Scott CM, Marlin DJ, Schroter RC. *Equine Veterinary Journal* 2001 **33** (6) 605-612.

#### **10. Royal Veterinary College, North Mymms, Hatfield, Herts.**

Six New Forest ponies were used in this experiment to try to tease out the mechanism of action of carprofen, a non-steroidal anti-inflammatory drug and pain reliever (NSAID) similar to ibuprofen. As with preparations made from steroids (see Experiment 2), the danger is that horses will be made to perform instead of resting and allowing the injury time to heal. The authors freely acknowledge the enormous variability in the action of NSAIDs in different species, so even if they solved the riddle in the horse, their result would only be relevant for other horses and not for any other species. The pain-killing, anti-inflammatory and fever-reducing qualities of the drug are already well established - the precise mechanisms of action being rather academic.

The horses had four plastic spheres implanted surgically in their necks, two each side, under local anaesthetic. They were then injected into these 'tissue-cages' with chemicals designed to cause inflammation, so that the reduction in inflammation achieved by intravenous injections of carprofen could be measured. Twelve samples were collected from each of the tissue cages by needle puncture over the following three days. Blood samples were taken from the jugular vein more than twenty times. On top of all this, the horses were injected nine times with the painful irritant bradykinin (the main constituent of bee venom) in order to produce a swollen weal, the size of which could be calibrated against the dose of carprofen.

The conclusion was that, although carprofen works well as an anti-inflammatory agent, the mechanisms of action are still uncertain and so further studies will, no doubt, be undertaken.

One of the researchers was supported by a grant from the pharmaceutical company, Pfizer Animal Health.

Pharmacodynamics and enantioselective pharmacokinetics of racemic carprofen in the horse. Lees P, Aliabadi FS, Landoni MF. *Journal of Veterinary Pharmacology and Therapeutics* 2002 Dec 25, 433-448.

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#### **11. Intervet UK Ltd, Huntingdon, Cambs**

Seventeen pregnant Welsh mountain ponies were deliberately infected with equine herpes virus (EHV) in order to test the effectiveness of a prospective new vaccine. Six of the mares were vaccinated at four months into their pregnancy, another six were vaccinated between five and six

months of their pregnancy, and six were unvaccinated 'controls'.

All eighteen mares (except one who had already aborted her foal) were dosed intranasally with virus when they were nearly nine months pregnant (gestation is around 11 months). Most of the horses suffered fever and nasal discharge and some suffered conjunctivitis and infected discharge from the eyes.

As expected, all six control mares aborted their foals within three weeks of becoming infected. One mare in each of the vaccinated groups also suffered an abortion. In another parallel (as yet unpublished) experiment, all six control mares again lost their foals to late-stage abortions and three of them became jaundiced and unable to move properly.

Using unvaccinated pregnant mares as controls is inexcusable in view of the vast body of knowledge from more than 50 years of research into a vaccine for equine herpes virus. The control data can be taken from previous experiments and from longer-standing knowledge of the equine herpes virus - which is known to cause abortion and respiratory problems. Aborting a foal at almost full term is a major trauma for a horse.

The research team claim that their candidate vaccine conferred 'exceptional efficacy' against respiratory disease and abortion. But they also acknowledge that several other herpes virus vaccines have looked promising in the past, until subjected to further assessment. Of course, the best way to minimise the risk of horses succumbing to EHV disease, is to stop transporting them all over the world and mixing them together in stressful and overcrowded conditions at international race meetings. Not only does all kinds of illness flourish in such conditions, a vaccine is likely to suppress disease only temporarily.

Equally, rather than deliberately injure low value (or any other) horses by infecting them with viruses, new vaccines - if they are to be used - can be checked for safety and effectiveness using non-animal laboratory methods (such as *in vitro* testing) and through trials on the general horse population.

Derivation and characterisation of a live equid herpes virus-1 (EHV-1) vaccine to protect against abortion and respiratory disease due to EHV-1. Patel JR, Bateman H, Williams J, Didlick S. *Veterinary Microbiology* 2003 91, 23-39.

## ... and the winners are

1. Animal Health Trust, Newmarket, Cambs; University of Cambridge, Department of Clinical Veterinary Medicine; Royal Veterinary College, North Mymms, Hatfield, Herts.

2. Animal Health Trust, Newmarket; Queen Mary and Westfield College, University of London; Department of Clinical Sciences, Kansas State University, USA; Royal Veterinary College, University of London

3. University of Cambridge, Department of Veterinary Medicine; University of Sydney, Department of Veterinary Clinical Sciences, Camden, Australia

4. Animal Health Trust, Newmarket

5. University of Cambridge, Equine Fertility Unit, Newmarket, Cambs; Babraham Institute, Babraham, Cambs; University of Cambridge, Department of Physiology, Cambs

6. University of Cambridge, Departments of Physiology and Clinical Veterinary Medicine

7. University of Cambridge, Equine Fertility Unit; Royal Veterinary University, Department of Clinical Studies, Copenhagen, Denmark

8. University of Edinburgh, Wellcome Trust Centre for Research in Comparative Respiratory Medicine, Roslin

9. Animal Health Trust, Newmarket, Cambs; Imperial College London, Department of Biological and Medical Systems

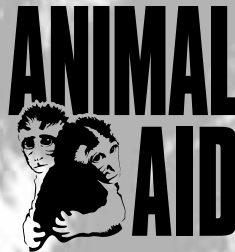
10. Royal Veterinary College, North Mymms, Hatfield, Herts.

11. Intervet UK Ltd, Huntingdon, Cambs

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Report by Kathy Archibald, Animal Aid Scientific Researcher.



**Animal Aid exposes and campaigns  
peacefully against all animal abuse,  
and promotes a cruelty-free lifestyle.**

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