



ST DAVID'S EQUINE
VETERINARY SURGEONS

ST DAVID'S EQUINE PRACTICE

NEWSLETTER

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ST DAVID'S EQUINE PHONE SYSTEM

The telephone number for the St David's Equine is 01392 876622.

To get the most efficient response once you are through to the practice please press '2' for equine reception to book calls, lameness work-ups, scintigraphy, to order any drugs or supplies and to make general enquiries. Press '4' for the finance department if you wish to make a payment or for any enquiries regarding your account. If you have an emergency or it is out of office hours please press '0'.



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THEATRE IN USE AT NUTWELL

Our theatre and recovery facilities are now in full use at Nutwell. We are able to offer a full range of orthopaedic and other elective surgeries and also some emergency orthopaedic surgery. Our new arthroscopy set up is up and running as can be seen from the picture opposite. This equipment enables us to perform delicate joint and tendon surgery which we were unable to do before. We have two visiting orthopaedic surgeons available to us as well as experts in other fields of equine surgery. Our own vets Ben Crisp and Sally Bainton are performing the anaesthesia and Bob Barker and Tony Kaye are performing some of the surgery and assisting the visiting surgeons.



SPRING LECTURE SERIES

We are planning a return for our very popular lecture series early spring 2007. We are also hoping to hold practical demonstrations at the practice. The lectures will be held at The Maltsters Arms in Woodbury again. The proposed subjects are listed below. A mailing will be sent out closer to the time with the finalised dates and subjects and places will be given out on a first come, first served basis. Therefore if you would like to reserve a place, please send an e-mail to alison@stdavids-vets.co.uk stating which lecture (or lectures) you would like to attend. A donation to an equine related charity will be asked for on the night.

Equine Fitness

Vaccinations and Viral Diseases

Scintigraphy (Bone Scanning) and Arthritis

The Older Horse - Dentals, Diets and Livers

NEVER MISS AN ISSUE OF THE NEWSLETTER!

Currently our equine newsletter only goes out to those clients who have had work done in the month preceding the newsletter issue. Obviously most clients don't have us out every month so if you enjoy reading this newsletter and would prefer to receive it in PDF format via e-mail, please send an e-mail to alison@stdavids-vets.co.uk putting **newsletter** as the subject.

EQUINE FITNESS & TRAINING

The horse has undergone millions of years of selective breeding to produce the anatomy and physiology to run away fast and to cover many miles to find food. Anatomically these adaptations include lengthening of the leg, reduction in the number of digits and loss of the collar bone. Physiological adaptations have enabled greater oxygen delivery to the muscles and a greater ability to use the available oxygen at the sites it is needed the most.

Below is a table of comparisons between the horse and the human athlete.

	Horse % of body weight	Human % of body weight
Heart	1.1% 220L/min, best 550L/min A barrel holds 247L!	0.5%
Spleen	1% Can hold 12L of RBC	0.3%
Lungs	1.5%	1.4%

ADAPTATIONS

There is not a lot you can do with your horse's anatomy - its leg length is not going to change however much training you do! But all of the physiological parameters and muscle mass can be adapted by training, and endurance can be helped with a good knowledge of nutritional needs and training schedules.

In the short term the best way to increase performance is a good warm up. This has the effect of raising the body temperature which increases the speed the enzymes can break down fuel reserves. It increases blood pressure which has the effect of opening up blood vessels particularly in the lungs so better oxygenation of the blood occurs. It also increases the elasticity of the skeletal system and increases circulating plasma volume and circulating red blood cells, partly aided by the contraction of the spleen.

LONG TERM ADAPTATIONS

Training

This has to be tailored to the discipline that the horse competes in. Obviously sprint horses will work on

maximal speed and increasing the anaerobic capacity of the muscles, whereas endurance animals and will not need to train at maximal speed but need to increase the aerobic capacity of the body. For the muscles to adapt to training they need to be stressed and subjected to periods of hypoxia. This will stimulate the genes to produce more enzymes and proteins. The most important, and often overlooked, part of any training schedule is adequate rest between strenuous exercises. Once used up it can take 3 days to replace the glycogen in the muscles, (this can be speeded up by giving intravenous glucose infusions) it takes 10 days to repair muscle damage and 24-36 hours to replace any fluid lost due to sweating.

Heart weight	10% increase
Capillary density in muscles	36% increase
Enzyme capacity	100% increase
Lactate levels	51% decrease
Plasma volume	30% increase

Effects of training on the horse

Effects of feeding the horse

Muscle glycogen cannot be increased with training in the horse as it is already at a maximal level. Carbohydrate loading can often be detrimental as it increases muscle pH, decreases lipolysis and reduces the release of glucose from body stores. It has been shown that there is no benefit from feeding high levels of protein. The only parts of the diet that can increase run time to fatigue is to increase the fat and fibre along with electrolyte supplementation

All **these** factors work together to allow a greater oxygen delivery to the muscles increasing performance and run time to fatigue.

TYPES OF FATIGUE

Anaerobic

This occurs due to the breakdown of energy without the use of oxygen and is required in high power short sprints. Lactic acid is produced as a by product of anaerobic metabolism. This raises the pH in the muscles and blood which inhibits muscle contraction. The horse

capacity can be increased by training. The measurement of lactic acid in the blood is a good indicator of levels of fitness and can be used as an indication of the success of your training regimes.

Aerobic fatigue

This essentially occurs when fuel reserves run out or supply cannot meet demand, and/or fluid/electrolyte loss is high enough to reduce the circulating volume. Training alters the body to allow more efficient release of fat reserves and therefore quicker conversion to useable energy for the muscles.

Signs of fatigue

Reluctance to exercise

Muscle soreness

Excess Sweating

Decreased appetite

Decreased thirst

Flared nostrils for long time after finish of exercise. High respiratory rate

If these signs are ignored or missed and work is continued without the proper treatment then it can lead to exhaustion.

Signs of clinical exhaustion

Depression/distress/abnormal behaviour

Increased rectal temp $>41^{\circ}\text{C}$

Persistently raised heart rate $>60\text{bpm}$

Thumps (diaphragmatic flutter, looks like hiccups)

Muscle fasciculations

Colic

Heart arrhythmias

Dehydration

This can be a potentially life threatening condition, and recovery will take a prolonged period and certainly put back any training schedule.

Avoiding exhaustion is a combination of adequate fitness for the sport undertaken, early recognition of fatigue, and electrolyte supplementation both before during and after the event.

ELECTROLYTES

A horse's sweat is isotonic (same concentration of electrolytes) with the plasma, unlike humans which is hypotonic (lower concentration of electrolytes) and

therefore much less "salt" is lost. For the equine it has been calculated that over a 2 hour period of moderate exercise the horse will lose 20L of fluid, 58g sodium, 106g Chloride and 27g potassium. This has the effect of loss of circulating volume which causes overheating due to the loss of the cooling effect of the circulating fluid. The loss of the chloride ions has the effect of making the blood alkaline, which contributes to fatigue. Just replacing the water can make the situation worse and in some cases has caused acute death of the animal as the fluid will further dilute the remaining electrolytes and cause heart arrhythmias. Also the horse will not have a great thirst as the circulating fluid is still at the correct concentration and this fools the brain into assuming it has enough fluid. As the saying goes you can take a horse to water..... To overcome this problem we supplement with electrolytes as this stimulates thirst and replaces the lost electrolytes. It is best supplemented in the normal feeding



regimes (for moderate exercise e.g. hunting or eventing, need 25g salt per 100kg body weight per day), while on the day of the event a balanced electrolyte solution, which can be homemade (tablespoon of salt + tablespoon low sodium salt in four litres of water.) It is best to train the horse to drink this kind of fluid before you get to the event. For endurance riders, carrying this amount of fluid around with them is impractical so a concentrated commercial electrolyte paste is often given to stimulate thirst and the intake of water while competing. A horse is unlikely to drink cold water when exercising but can often be encouraged to take warm water.

If the animal is severely fatigued or exhausted then they will not drink, no matter how dehydrated. At this time the vet is needed to give the extra fluids either by stomach tube (not pure water) which is the preferred method, or if necessary by intravenous fluids.

By Ben Crisp

SPONSORED RIDER FEATURE—MATT HALL

2006 has been a hectic year for us. Improvements to the yard finally concluded early in the year and a new rubber surface on the school from Jackson Arenas added the finishing touch. And of course St David's Equine Practice joined us with their veterinary centre which includes an examination room, stabling and lunging area. Thankfully winter is a quieter time on the competition circuit when we take the opportunity to work on horses' flatwork and schooling. We continue a variation of fitness work on the road, and as we are very fortunate to be on the edge of Dartmoor, hill and canter work on the moor.

The competition season began with the two day show at The Grange, an exciting new event which included the Puissance, and a Grand Prix sponsored by St David's Equine. We have a promising string of young horses but I decided that this event might over face them so early in the season. So it was left up to my old campaigner *Poplar's Present* to represent the yard. Having been off most of the winter with foot balance problems (rectified by Ben Chamberlain the farrier and Tony Kaye) *Poppy* did lack competition fitness but proved what a gutsy mare she is by getting up to 1.70m in the Puissance. She then jumped a superb clear in the first round of the Grand Prix, followed by a quick jump-off with a couple of poles down when her lack of fitness started to show.



Poplar's Present in action at The Grange

The other new indoor event was at Exeter Equestrian Centre, a gala evening which included a 1.30m Open, and a Ride and Drive class. *Poplar's Present* gained a creditable 2nd in the Open whilst two of the younger horses, Claire McDonald's *Mr Rafferty* and my part

owned *Lucky Eddie* jumped good rounds in the Foxhunter. The Ride and Drive sorted the men from the boys however! *Eddie* lost the plot in front of the bright lights and a rowdy, well oiled crowd, whilst *Rafferty* coped under pressure and jumped a lovely clear, followed by a very professional drive in the cupod. The year continued with the usual round of competitions although we took the pressure off *Poplar's Present* by giving the county shows a miss, and concentrated on the younger horses.

This paid off with *Sabina III*, a German bred mare by *Espri*, and *Lucky Eddie* by *Carnival Drum*, both qualifying for the Newcomers 2nd Round, a direct qualifier for HOYS. The Newcomers 2nd Rounds began at the Dorset Showground which proved an eye opener with the 1st round starting at 1.36m. Other outdoor shows included the usual three day events at the South West Show Jumping Club at Bicton Arena, Redpost, The Hand and Coombe Park. Results included the qualification of *Poplar's Present* for the Welsh Masters Open, and the others qualifying for the Welsh Masters Foxhunter.

Our longest trip was to Addington EC in Buckinghamshire, a 4am start to compete against some big names and international horses. This was a real learning curve for our horses with huge tracks and strong competition. They did extremely well, *Sabina III* and *Lucky Eddie* both jumped solid rounds in the Newcomers 2nd Round although the odd pole kept them out of the jump off. With 110 in the class however, we were extremely pleased with their performances this being their first exposure to competing at such a level. *Poplar's Present* was then left to tackle an international field in a 50 strong Grand Prix. At only 16.1hh she seemed fairly insignificant up against some of her rivals and indeed the fences, but did us proud with only two down and a placing of 15th.

This pretty much concluded the outdoor season and a couple of indoor shows will keep us ticking over until the New Year when our indoor campaign really gets going. Until then we are as busy as ever at home and have no idea how we are ever going to get any Christmas shopping done!