

Media communiqué

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Tailor-made functional garments for top athletes of the four-legged kind

Hi-tech Horse Blankets for the 2008 Summer Olympics

In a project together with Vetsuisse, the Faculty of Veterinary Science of the University of Zurich and the Echler textile company from Canton Appenzell, and with support from Swiss Olympic, Empa has developed a novel blanket for the horses of the Swiss team at the Olympic Games in Hong Kong, where the equestrian events will be held. The blanket is designed to protect the animals from abrupt increases in temperature, as well as the feared chill effect on returning to the stable after competing. Recently the hi-tech blankets were tested on Shetland ponies in the climate chamber at Empa St. Gall with very positive results.

When the horses and competitors go through their paces at the Summer Olympics in Hong Kong in 2008 it will be very hot and very humid – just as it is every summer there. Three special blankets will offer the Swiss teams' tournament horses some respite from the elements. When the animals move from their air-conditioned stables to the tournament venue, they will be protected from the brilliant sunshine by cooling covers. This will allow them to better withstand the effects of the heat and ensure that they are able to give their utmost during the competition. And after the their event is over, "sweat blankets" will help them to dry off as quickly as possible – one to cover them as they return to the stables, and another to wear in their air conditioned quarters. These special garments offer support to these sensitive and valuable champion horses in their own efforts to regulate their temperature and prevent the dangerous «post exercise chill effect», the unpleasant and unhealthy uncontrolled cooling which leads to the animals becoming chilled after exercise.

In developing the novel material, which is specially optimized for this equestrian application, Empa scientists based their research on an idea by Anton Fuerst, the Veterinary Surgeon of the Swiss dressage riders association. They began work on the project, named "Horse Blankets Hong Kong", a year ago, in collaboration with the Eschler company, (which is based in the town of Buehler in Canton Appenzell), and the Vetsuisse Faculty of Zurich University.

Seeking the best multilayer material for the horse blankets

The search for the optimal combination of various layers of material led the Empa team, headed by Markus Weder, to make the first perspiration tests on a heated cylinder which simulated a human torso both in shape and size, and in its ability to transpire. The principle behind the development is that covers made of many layers are particularly good thermal insulators which also protect the horses from the sun's rays and keep the animals cool before competing.

Two Shetland ponies were recruited to make the first “live” measurements with the prototype blankets. Show jumping horses would simply have been too large for the climate chamber at the Empa St. Gall site, which can simulate temperatures of over 30°C and a relative humidity of 80 per cent. The docile and easily trained ponies were taught what was expected of them during a week-long training session on the treadmill at the Zurich Animal Hospital, following which (with the consent of the Veterinarians Office of St. Gall Canton) the two tiny horses began their activities as guinea pigs. For the complete duration of the tests the ponies were monitored by vets who continuously measured physiological parameters such as skin and body temperatures, quantity of sweat, pace length and ECG values.

Shetland ponies in Empa’s climate chamber

After a series of tests with the ponies, distributed over a fortnight and each of one-hour duration, Markus Weder and his colleagues were able to confirm that the new blankets worked very well. Without them the skin temperature rose to over 40°C due to the simulated sunshine and increase in temperature when the animals moved from their stable to the competition venue. With the multilayer cooling blankets, however, this value rose to only 38°C. The horse’s skin temperature remained cooler, therefore, when the blankets, which are made of a special material which stores latent heat and reflects heat radiation, were used.

After their physical activities, the ponies’ handlers covered them with equally novel sweat blankets which can absorb six times more perspiration than conventional, commercially available blankets. This enables the animals to dry off significantly faster than was previously possible. Were the ponies to be brought from the warm, humid climate chamber directly to conditions simulating an air conditioned stable without the new sweat blankets, their skin temperature would fall from 40°C to 21.5°C within a very short time. Such an abrupt drop in temperature can cause the dreaded post exercise chill in sweat-drenched animals, and encourage infectious diseases to develop. With the sweat blanket newly developed by Empa, the ponies’ temperatures merely fell to between 39°C and 35°C. Thanks to a reduction in sweat evaporation due to the novel blankets, the animals’ skin cooled to a much lesser degree, minimizing the strain on their health.

These very promising results have moved the Swiss Equestrian Federation to order tailor-made hi-tech blankets for all the horses of the Swiss teams participating in the 2008 Olympic Games in Hong Kong. And who knows – maybe one or two of them will bring back an Olympic medal with a little help from Empa technology!

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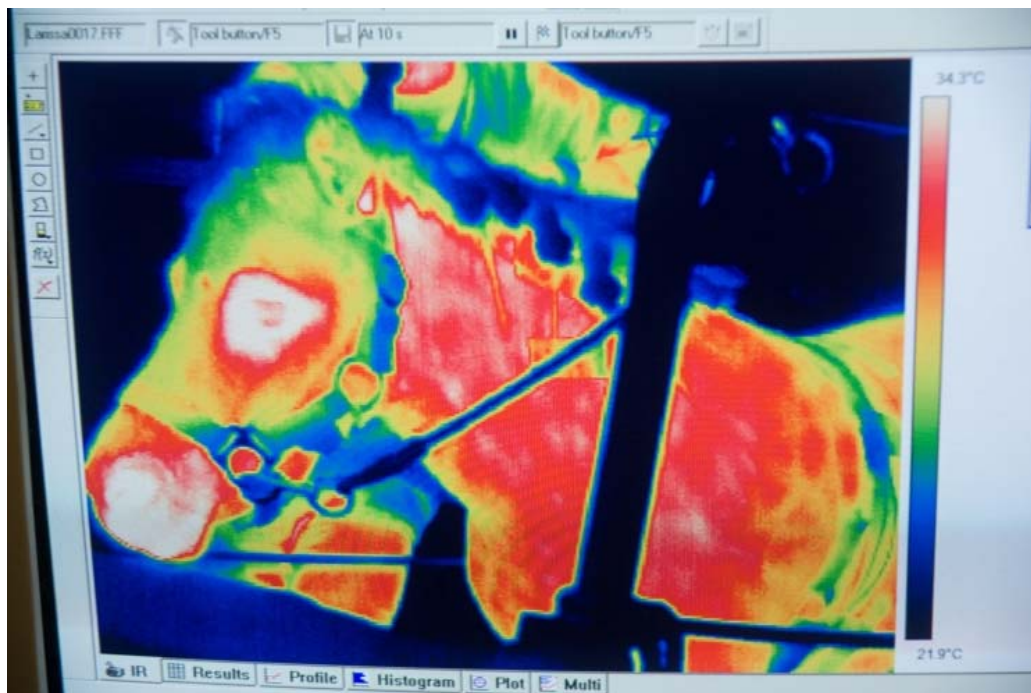


Shetland pony «Tequila» is fitted out with sensors outside the climate chamber at the Empa in St. Gall.



Shetland pony «Tequila» walking placidly on the treadmill in the Empa climate chamber under the watchful eyes of a veterinary surgeon.

Images can be downloaded as jpg files at: http://www.empa.ch/bilder/2008-05-28_Pferdedecken/



Monitoring the pony with an infra-red camera clearly shows which parts of its body are warm (red) and which are cool (blue).



Shetland pony «Larissa» shows off her tailor-made cooling blanket.

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