WAHO: WHERE EVERYTHING COMES TOGETHER

The Conference in Doha, Qatar on 2nd, 3rd and 4th November 2011

By *Monika Savier*
Photographies: Simona Orvieto, Monika Savier

The Qatar Racing & Equestrian Club, the WAHO Member Registry in the State of Qatar had invited the delegates and observers of the 70 member countries of WAHO to this year's WAHO conference, held between 1 - 8 November. Delegates and Observers from fifty countries of the world had come for this outstanding international event, with more than 400 people taking part in the presentations, discussions, and pre and post conference guided tours visiting the top Arabian horse studs.

The WAHO Conference was held under the patronage of the special Advisor to the Emir, HH Sheikh Abdullah bin Khalifa Al Thani, and the Qatar Racing and Equestrian Club was the host of the Event, which was held at the Ritz-Carlton Hotel in Doha.

On November 1, the event started with a WAHO Executive Committee meeting and at the same time, the WAHO World Registrars meeting.

In these meetings, the topics discussed were not only questions and decisions concerning the registration, reproduction, and health of Arabian horses, but also accepting the studbook of Japan into WAHO, and dealing with the matter of India, South Korea, and Taiwan, all three of which had asked Australia to act as proxy for them in all matters concerning their studbooks and many other thematic issues and WAHO registration rules.

The evening was dedicated to the Welcome Reception dinner at the Golf Club, at which Mr. Sami Jassim Al Boenain, General Director of QREC, made an excellent welcome speech.

From November 2 on, the conference was also open for all the observers flown in from all over the world, as the biennial WAHO conferences are an international well-known highlight not only from the points of view of contents and culture, but also unique for their social aspects. Friends from all cultures and religions of the world come together, all of them looking for a common denominator on the important content matters inherent for breeding Arabian horses, just as they are together for experiencing the world of Arabian breeding in the host country. There are the unforgettable experiences of the 2007 and 2009 WAHO conferences hosted by Syria and Oman, respectively, where the fairy tales of "Arabian Nights" became a spectacular reality. Qatar was challenged hard in this area, and many of the participants from all over the world had been at the former conferences and were looking forward to Qatar possibly even topping these legendary WAHO events.

The Opening Address was spoken by WAHO president Dr. Hans Nagel. Foremost in Nagel's mind were profound thanks to the host country of the conference: Arabian horse heartland Qatar, with His Highness Sheikh Abdullah Bin Khalifa Al Thani giving WAHO the honour of being the patron of the event, and with His Excellency Sheikh Mohammed Bin Faleh Al Thani, Chairman of the Qatar Racing and Equestrian Club, as the promoter and driving force behind the organisation of the conference.

Nagel took the opportunity to remind all the delegates that in order to call the conference a success, it was the future of the Arabian horse that needed to be thought about. In simple but complete words: "how we can keep it with us to provide a source of joy for us and future generations." He asked everybody to make good use of this WAHO conference to this aim. For the following days of the conference which awaited all participants, he thanked again the

Qatar hosts, who would give the delegates the opportunity to see the richness of Qatar and experience all the efforts that have been made to give the Arabian horse a good home in their country.

After that, the conference proper started when Judith Forbis, senior expert and founder of the renowned Ansata Stud in the US and author of several books, delivering her much-expected tribute to the horses of Qatar with a presentation on the history of Arabian horses in Qatar, from pre-Islamic times to the present day.

Judith Forbis
"A Tribute to the Horses of Qatar"

Judith Forbis' presentation, titled "The Heritage of Al Shaqab", honored the horses of Qatar – no less than that would have been possible, as His Highness the Emir's Al ShaqabStud takes its name from the fierce battle of 1893 that took place nearby. When Bin Mohammed Bin Thani led his Qatari warriors mounted on valiant Arabian horses and claimed the victory, that was the turning point in Qatar's history and paved the way to the country's future independence. His Highness The Emir Sheikh Hamad Bin Khalifa Al Thani, Qatar's ruler since 1995, is a direct descendent of Sheikh Jassim and the seventh sovereign of the Al Thani dynasty.

The Al Thani descend from the pre-Islamic Beni Tamim tribe. These famous camel and horse breeders were the largest tribal federation that lived in the Nejd in the 5th and 6th centuries. The Al Thani ancestors, ever looking for pasture for their animals, eventually migrated to the Qatar peninsula, where around 1818 a foreign traveler noted that "while most tribes in the Nejd have one horse to every four or five tents, Tamim have considerably more … in general they raise magnificent and excellent horses".

Specific mention of the Tamim horses is found in the Abbas Pasha Manuscript (around 1840). It lists a celebrated Dahma Shahwania mare of Isse Bin Tareef of the Ali Bin Ali tribe from the town of Al Bidda – today's Doha.

In the 1850s Sheikh Mohammed Bin Thani led the family, united the tribes of Qatar under his leadership, and became the first actual reigning sheikh of the peninsula. The times were turbulent in the Gulf region, and Sheikh Mohammed put much emphasis providing Arabian horses for his warriors. Even while the battles raged over rule in the region, there was an ongoing exchange of horses and therefore bloodlines between the Al Thani, the Al Khalifa, and the Al Saud, as reported by British political agents.

The horse trade intensified further when Sheikh Jassim succeeded his father in 1878. He is reported to have been a superb horseman with ever a keen eye for a good horse. It is known that he kept horses of the Dahman, Obeyyan, Wadnan, and Hamdani strains (among others) and much engaged in trade with Mohammed Ibn Rashid, whose horses are regularly mentioned in the Abbas Pasha Manuscript. The Rashid collection of horses had a reputation for excellency and beauty that was known all over

Arabia and even to Lady Anne Blunt in her time. In 1893, it was Sheikh Jassim Bin Mohammed Al Thani with his warriors, camels, and well-bred Arabian horses who won the battle of Al Shaqab that paved the way for Qatar's future independence.

When the 20th century arrived, the gun car replaced the horse and rider in Arabia, but Arabian horses remained an integral part in the daily lives of Arabian people, and the Qataris in particular. A story tells of a horse race between the sons of Sheikh Jassim which caused the younger son to write a poem to his beloved mare after she lost. It is an historic fact that in 1928 the elder son, ruler Sheikh Abdullah, sent his prized Dahman mare as a gift to the ruler of Bahrain when the Dahman strain had diminished in that country to one mare.

There is a period when little is known about horse activities in Qatar, but even in the years leading up to 1960, the Al Thani family kept several stables of horses which were used for maintaining the breed, police work and traditional celebrations.

During the rule of Sheikh Abdullah's grandson Sheikh Ahmed Bin Ali, Qatar became independent as a sovereign state in 1971. Sheikh Ahmed was passionate about horses, bred the Abeyyan, Tuwaysan, and Wadnan strains, and built the stables at the Racing and Equestrian Club, where the first national and international horse shows in Qatar were held.

When a world-wide renaissance in Arabian horse breeding came about in the l980s it led Qataris to build new stud farms and import Arabian horses. Qatar became a member of WAHO with 26 locally bred and 105 imported Arabian horses in the studbook. Several of the great stud farms of Qatar today among the Al Thani family and other breeders, to mention only a few, are: El Nasser, Al Rayyan, Al Naif, Al Shahania, Um Qarn, Al Shaqab, etc.

With the founding of Al Shaqab in 1992, the history of the Arabian horse in Qatar has come full circle from the guardianship of the previous Al Thani rulers to His Highness The Emir Sheikh Hamad Bin Khalifa Al Thani and other important Qatari families today. They have kept the Arabian horse in high regard and added to its reputation at home and abroad. Both the Senior and the Junior Champion Stallions of the 2001 World Championships were bred and owned by Al Shaqab, half of the championship titles of The All Nations Cup in 2002 were won by Qatar horses, the World Champion Mare of 2002 was from Qatar as well, and three World Champion Stallions also were bred in Qatar – to note only a few of the greatest successes. Arabian horses have flourished in Qatar, founded stud farms world-wide, and have become this country's goodwill ambassadors throughout the world.

(Compiled and partly quoted from Judith Forbis: The Heritage of Al Shaqab copyright 2011.)

The WAHO General Assembly then started with the Opening Address by Dr. Nagel. In his words, WAHO has a long-standing tradition of discussing things and reaching a consensus. So he first presented some statistics, meaning he started with the smallest problem. World-wide, there were 23.000 registered Arabian foals in 1995 and 21.000 in 2010, and the total number of horses around 210.000. For the whole Americas, the number dropped from 14.000 foals in 1995 to 7.000 now, balanced by the development in the Middle East (from 2000 foals to 5000), and to some extent in Africa. Europe remained quite stable, with 7000 foals in 1995 and now, but inclines or declines within countries.

At the same time, the quality of the horses increased overall. Nagel reminded his audience that ten years ago, many people objected to WAHO bringing Middle East countries in. At that time, the Western world was used to a written five generation pedigree, whereas in the ME it was all oral tradition and no hard proof that only purebreds had been used. WAHO was courageous enough to accept these countries anyhow. It turns out all the huge increase was in favour of the breeders of the West.

Nagel added that in his opinion, too much emphasis is put on these four or five generation pedigrees, which we need for the studbook, for breeding concepts, for information. But nobody really profits if we know five generations for judging, schooling or distributing horses, or for preserving the whole world population. All WAHO is based on compromise. We are only here together because all the studbooks agreed on the smallest denominator we could find. WAHO desperately needs horses, every Arabian studbook does.

A great concern of Nagel's were the various new technologies which basically enable us, as he said, to unravel the genetic make-up of a horse.

Of Artificial Insemination, which is totally forbidden for Thoroughbreds, Nagel stressed the helpful aspects: protection against diseases, supportive in the case of sick animals, a great help for breeders when there are great distances to be bridged. He could not think of any serious arguments against AI.

Embryo Transfer is different, stated Nagel. Some countries allow it without any restriction, some forbid it, some allow it within limits. WAHO allows it as well. But if you give people freedom, some people will use it responsibly, and others irresponsibly. We are watching carefully, as there are negative and positive sides. We need to protect the Arabian breed, and we need to protect the individual animals, but at the same time, mares that could not have a foal by natural means can have one. We do not want to encourage a system where the breed, renowned throughout history for its fertility, gets undermined by this scientific means. We are warned. It is one of WAHO's duties to protect those properties of our animals that make them so valuable.

In the ethically highly questionable issue of Cloning, Nagel thought WAHO should confirm a firm ban on cloning, which nobody wants anyway.

Regarding hereditary disorders, prominent among them SCID and CA, Nagel cautioned against raising too much of a ruckus about them, as people and breeders might get the opinion that the Arabian breed gets loaded with effects that other breeds do not have, which is a terrific loss of image. Instead, the Arabian community should learn to think about it properly, to discuss it orderly, and to find a way that is suitable and fitting. Sooner or later, Nagel said, cooperation will lead to a solution. The genetic

Mr. Sami Jassim Al Boenain, General Director of QREC, and HE Sheikh Mohammed Bin Faleh Al Thani, Chairmen of QREC.

testing routines which have been developed to deal with these disorders have given rise to scientists working to unravel the genome of the Arabian horse. They may even, one day, find markers which determine if this Arabian horse is pure or not. There are also markers that indicate genetic disorders. Once again, Nagel cautioned against the negative trend that seems to arise from that: these scientific findings are used to interfere in the integrity of our Arabians. All purebred Arabians have a historical basis in the desert, and every horse is registered in a WAHO studbook. “This is our message now”, Nagel said, “it's a unique genome that has come together that way.” But at the same time, there is not ONE genome for the ONE Arabian horse, and the very versatility of the Arabian horse stems from the variety in that unique gene pool.

Last not least, Nagel listed “welfare of the horse” as an issue of high priority in the Western countries. This is closely related to the wealth of information everybody can get from the internet, thousands of eyes are watching out for how high a handler raises his whip. The Arabian community needs to protect the reputation of a breed which is very much attached to humans and should be handled accordingly. Not every tool to get a personal advantage should be used. As not every item could be addressed within the few days of the conference, Nagel asked all the delegates to be available to each other. “We tend to be too conservative and we should all open the door to these kinds of questions”, he commented. The development of the Arabian horse is in the hands of each national Arabian society, which makes for a healthy wealth of influences, conditions, environments etc. WAHO is not meant to interfere here. What WAHO can and will try to do, however, is try to see ahead, think ahead of issues and trends, evaluate trends and methods, and give recommendations according to these evaluations.

Later that evening, all delegates had the opportunity to spend a gripping evening in the fascinating world of Arabian race horses on the race track of the Qatar Racing and Equestrian Club, featuring, among others, a WAHO Cup endowed with a good purse.

On November 3, the conference started with the report from Mr. Kees Mol of the proceedings of the World Registrars Meeting. After that, two focus presentations accommodating the general uncertainty among breeders as to the latest findings in genetics, as well as to breeding of and selection among Arabian horses.

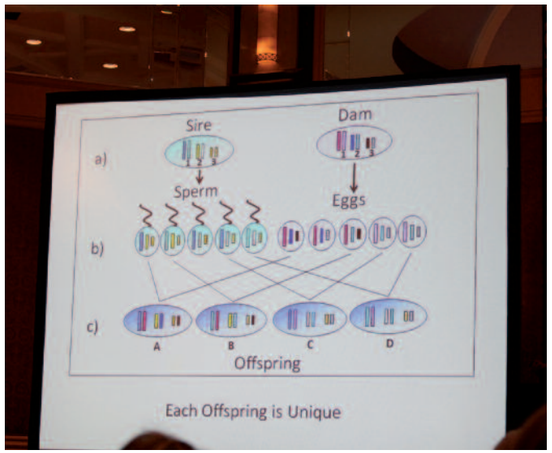
Professor Matthew Binns was first Guest Speaker on the morning of 3rd November, starting with a gripping presentation on the findings of his research on the Institute for Equine Analysis in Lexington, Kentucky, USA: “Advances in Equine genetic research and how new information can help breeders”.

Prof. Matthew Binns

Matthew Binns used a caricature of a top-pedigree foal being challenged by a no-name foal to illustrate his point: impressive pedigrees get everybody to think most highly of the horse involved, but will the genetic reality live up to expectations? There are trillions of possible combinations of genes from repeated mating of the same individuals. A geneticist can state only two things: that the "Y" chromosome moves along the male line, being passed on to sons only, while genetic material from maternal mitochondrial DNA is passed on to sons and daughters alike, which is why we speak of founding mares and founding families. Analysing pedigrees, breeders will insist that the special traits of the particular horse are from that special ancestor duplicated several times in his or her pedigree. Actually, any of the 16 fourth-generation ancestors contributes an average of just over 6% of genetic material (which amounts to about 4 chromosomes) to the animal in question, and any of the 256 eighth-generation ancestors contributes less than 0.4% or 0.25 chromosomes. When it comes to maternal lines, all females that trace back to a certain female ancestor should carry the same mitochondrial DNA sequence. If this is not the case, there must be an error somewhere back in the pedigree. We have to accept that before blood typing for parentage identification, this occurred quite often, as Binns illustrated with some TB founding mares.

But today, it is possible to get a complete horse genome sequence, which takes less than a week and costs about 3000$. The method used today takes advantage of a simplification, explained Binns: what mostly distinguishes individuals is mutations, such as eye or hair colour. These are easily identified by their respective genetic markers. To analyse the genetic setup of horses, up-to-date technique uses test chips or plates each containing 50.000 genetic markers to be scanned with an "Illuminated Beads Array" analysis. At this point, Binns took a detour into inbreeding to make an important point: In the context of historic breeding lines, the lines only really report the passage of (maternal) mitochondrial DNA and (paternal) Y chromosomes through the pedigree. The rest is a jumble. Why? When curious scientists compared the inbreeding coefficient in Thoroughbreds calculated from DNA against that calculated from pedigrees, the figures didn't correlate. Obviously, the pedigrees are very poor indicators of what genetic material is present. Again: Why? Because there are different variants of certain chromosomes, said Binns, illustrating his statement with the example of socks (leg markings) inherited from parents to offspring, who may have widely differing socks. One implication of this fact is that a trait believed to be inherited from a certain ancestor may actually have been inherited from another. Repeat: historic breeding lines only really report the passage of (maternal) mitochondrial DNA and (paternal) Y chromosomes through the pedigree. The rest is a jumble.

Then there is domestication. About 5000 years ago, man caught only a few from the stock of free-roaming horses and domesti-



cated only these. Later on, breeds were established, with each breed again catching only a little bit of the genetic variation of the stock present at the time. For the Arabian horse, that means that most of the genetic material of the Arabian horse is present, at least in part, in other breeds as well, as they were all caught from the same stock. However, the combination of genetic material in the Arab is unique. So when scientists started working with their plates of genetic markers, they found they could use them for a lot of breeds. Binns's group at the University of Minnesota has worked with 354 horses of 20 different breeds by now and has, among others, been able to genotype from hair samples distinct populations within the Arabian breed, including Polish, Spanish, Crabbet/Egyptian and "domestic American". Genotyping allows for an overall "tree" of horse heritage to be drawn, showing the relationships between the breeds. In addition, "cluster analysis" of 55.000 markers out of the available genetic data shows that in the Arabian breed, all horses share a great percentage of the genetic material, making the Arabian a very pure breed. There is not a lot of variation between the different lines of Arabian horses.

Binns was very astonished, however, that the Arabian horse and the Thoroughbred horse are quite far apart genetically, even though three Arabian horses were co-founders of the TB. Practical application of genome analysis has been attempted for the Thoroughbred, trying to establish markers for racing performance. Sprint winners all were homozygous for a certain “sprint allele”, as were half of the distance winners, and 85% of Quarter Horses. And Arabian Horses? 90% of them are homozygous for a “distance allele”, and only 5% for the sprint allele. So as a rule, Arabians don't have the genotype for sprint racing, but are superbly suited for distance racing. And the sprint allele in the Arabian breed may have been introduced by Thoroughbreds, Binns offered, as it might actually have its origins in a British pony breed.

Finding out where in the genome the markers for a certain trait are located proved to be quite challenging. To provide some context for the complex trait of performance, the scientists first turned to another well-studied complex trait: white markings. A multi factorial mode of inheritance accounts for the fact that asymmetry in markings is common, even in identical twins, although all four limbs have identical genotypes. But there is a randomness to the expression of any trait, and also the effect of the environment, making the heritability of markings only about 70%. More markings are found in front feet and on the left side of the body. And many white coat colour loci (locations of genes) influence several traits, not just one such as colour.

Some markers that allow to distinguish between good and poor racers have already been established, as well as genes that determine height in horses. Conformation, explained Binns, is influenced by only a few genes which set off a cascade of other genes. So if scientists attempt to change one marker, they get massive changes in body shape. So there are promising possibilities, but still, there's a lot of effort and cost involved - is there a market for this kind of “genetic mapping”? Binns gave an emphatic yes, particularly in the Arabian scene, where horses with an interesting pedigree and good conformation may change hands for very high prices, only to be found lacking in the performance the new owners had hoped to buy. The new techniques will inform on the history of breeds and on relationships between horse breeds. Studbooks become controllable. Diseases can be combated, complex traits such as gaits can be analysed, having the complete genome sequence analysed of a horse will become common.

There is no such thing as a perfect genome, however, cautioned Binns. Of course we should avoid using animals with obvious defects, with actual diseases or carriers of diseases. The breeding stock should be gene tested to avoid carriable diseases. But otherwise: cherish diversity, was his closing comment. There are wonderful genes and values in any individual.

In his presentation titled: “The paradigm has shifted: Genetic testing as a positive tool for breeders”, Binns’s colleague Michael Bowling explained the scientific background knowledge for genetic disorders, and why systematic testing for genetic disorders is the only way to prevent the occurrence of affected horses in the Arabian breed.

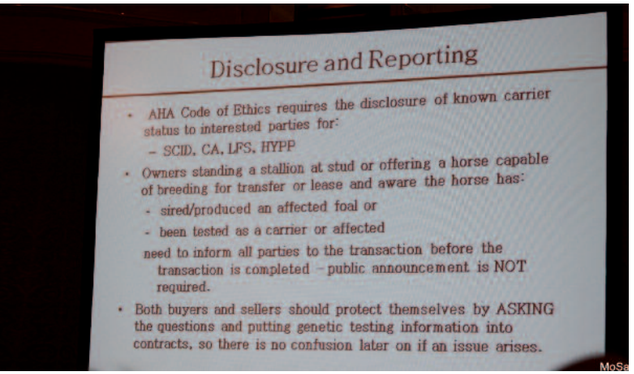
Dr. Michael Bowling

A lot of basic genetics was used and reviewed in Bowling's facts-packed speech. Mutations, he explained, are the ultimate source of all genetic variation. If they occur in the 2-3% of functional genes (the rest of the genes does not serve a function and is referred to as "junk DNA") and the body does not repair them (which it does in most cases), they can alter the gene's function, which can result in a desirable trait, a lethal disorder, or anything in between. Any gene consists of two alleles, and as the variable alleles occur at different frequencies, this accounts for the differences between breeds and populations. Selection for breeds and population changes gene frequencies, as do mutations and genetic drift. In the recessive mode of inheritance, two copies of any allele are needed for a trait to be expressed; this is why with recessive disorders, animals can be carriers without being affected. In the dominant mode of inheritance, one copy of the dominant allele is sufficient for the trait to be expressed - so with dominant disorders, animals that are carriers are also affected.

If a sire is very popular, some genetic diversity is lost in the breed. Moreover, the gene pool will receive an over proportional dose of this popular animal's genes, and these include whatever detrimental recessives he may carry. Later generations may express the recessive traits - the Founder Effect found in many close populations. The founder effect is one form of genetic drift, which has its most dramatic effects in small populations, as Bowlings demonstrated with the example of HYPP (Hyperkalemic Periodic Paralysis) in Quarter Horses: in the American QH Association, only 1.5% of animals are affected by HYPP, but in the much smaller Halter QH sub-population, a staggering 56.4% are.

There is a whole list of genetically determined disorders which make any breeder shudder; prominent among them for Arabian horse breeders are Cerebellar Abiotrophy (CA), Severe Combined Immunodeficiency (SCID), and Lavender Foal Syndrome (LFS), and they can all be gene-tested for. Some others for which there is no test are Occipito-atlanto-axial Malformation (OAAM), Juvenile Epilepsy Syndrome (JES), and Guttural Pouch Tympany (GTP), while owners of Arabian Partbreds need to watch out for HYPP again, as well as for Tying-Up and for Malignant Hypothermia. A whole list of further genetic disorders are under investigation for possible gene-testing.

Bowling paid particular attention to some of the genetic disorders that affect mostly Arabian horses; CA affects almost exclusively Arabians and their crosses. In CA, the Purkinje cells in the cerebellum part of the brain die off, resulting in disorganization of other brain cells. Affected horses are unstable on their feet and therefore liable to injury, but usually survive. Scientists succeeded in establishing first a genome scan and later mapping the target genome sequence. Today, direct gene testing is possible.



1. Lavender Foal Syndrome is a neurobiological disorder just as CA, and the symptoms can easily be misjudged as signs of spinal cord injury or encephalitis. It's known today which gene carries the mutation that causes the disorder, and it's possible to gene-test for it.
2. For SCID, where the deficient immune system results in death of the young animal, the location of the responsible gene mutation is also known and therefore easily testable.

For the neurologic disorder OAAM, in which neck vertebrae fuse and damage the spinal cord, limited research has been done. The disorder is thought to be recessive, but no test is available yet. For JES, research indicates that the mode of inheritance is dominant and that there may be a link to LFS. The seizures can be treated with traditional medications; gene-testing is not yet possible. GTP is easily diagnosed by the characteristic non-painful swelling behind the jaw. After surgery to correct the malfunction in the Eustachian tube, horses can live fully useful lives. The disorder is 4 times more common in fillies, and there are probably multiple genes involved, for which testing is not yet feasible.

As Bowling reported, the US-based Arabian Horse Association requires owners of breeding horses who are known to be carriers or affected by SCID, CA, LFS, or HYPP to inform everybody involved, while public reporting of gene-test results is not required. There are, however, voluntary organizations dedicated to publishing the results of gene-testing, such as FOAL.org. In working with recessive disorders, Bowling stressed, gene-testing offers the chance to evaluate each individual on its merits. Two carriers must never be mated, but otherwise, informed decisions can be made so as to maintain genetic diversity while using "clear" (non-carrier) offspring and reducing the incidence of carriers in the breeding population. Bowling was clear on the primary goal for every breeder: do not produce affected foals. As a secondary goal, he asked breeders to reduce the frequency of the mutation in the gene pool over time, but with an eye to genetic diversity.
Genetic testing is a positive tool for breeders to use to the benefit of the horses and the breed - not a weapon to be used against other breeders. Gene testing allows us to know the status of horses who are alive and breeding today, and decisions we make about today's horses determine the breed's future. The gene is not a disease, after all.

When asked questions after his speech, there were two particularly noteworthy statements of Bowlings's:
"Recessive traits take years, often several generations, to express themselves. The genetic disorders that now worry us so much have certainly been present in the past. They were probably not recognized, and foals died."
"As long as carrier individuals are used for breeding less often, the incidence of genetic disorders should go down".

After lunch, it was the turn of famous sculptor **Karen Kasper** giving an artist's perspective on portraying the Arabian horse from life-study, illustrating the ancient process of creating and casting bronze sculptures. After her speech, the unveiling of bronze sculpture portraits of the 3 World Champion Stallions bred and owned by Al Shaqab Stud: Al Adeed Al Shaqab, Marwan al Shaqab, Gazal Al Shaqab.

Al Shaqab Foundation

Following this, guests and delegates made a trip to Al Shaqab Foundation in order to visit the famous Al Shaqab Stud located there. The breeding program of the stud was studied and illustrated by presenting many of the successful mares, stallions, and foals. For the evening, the conference participants were invited for a gala dinner on the premises of the stud.

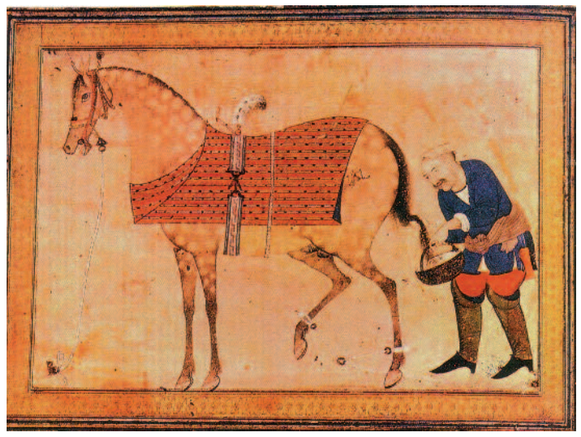
Al Shaqab Stud presentation

HRH Princess Alia Al Hussein Al Saleh

On the last day of the conference proper, November 4th, the first speaker was HRH Princess Alia Al Hussein Al Saleh of the Jordan. Princess Alia is, among others, president of the ECAHO Show Commission, where she has been working for a horse-friendly handling of Arabians in the show ring for a long time and with no small success.

The things HRH Princess Alia Al Hussein had to say about horses - The Relationship Between Horses and Humans in Today's World – rang a bell in every listener's heart, as it was her outspoken aim to "see not only where we are now" in our relationship with horses, "but how on earth we got to this…".In more religious times, practically all religions had strong guidelines, based upon respect, for interacting with the natural world. As an example, she told a story of the prophet Muhammad posting a soldier to protect a dog with newborn puppies by the path his army was going to take. The times when everybody was aware of the sacredness of life whatever the species, and of animals as sentient beings, are not so long past in many parts of the world.
What all the participants in the WAHO conference shared, Princess Alia made clear, is some form of interest, love, commitment, not only to horses but particularly to the Arabian horse, the versatile Improver whose genes have contributed to many of the other horse breeds.
However, and whatever the reason, we are not doing right by our horses, she stated clearly. While many horse owners and association officials try their best to ensure that shows do not feature abuse, and make owners aware of the issues, there are still many owners who do love their horses, but either do not recognize or turn a blind eye to bad handling and scared horses, and attempts at strict rule enforcement are often countered by pleas for leniency towards the professionals who are only doing their jobs.
She said that the more dangerous aspect for the future is the negative transformation of the versatile improver, the tough, intelligent, brave Arabian horse, into a neurotic flimsy travesty; not only off-putting to non-Arabian horse people, but with questionable potential for any life outside the show ring and a very poor prospect for the long-term viability of the breed.
She went on to say that some of us decide to give other horse sports a try. Sports such as endurance involve positive exercise, and when training and feeding are done realistically and the rider refrains from wanting to win at all costs, they can be great. Too little skill on the rider's part is often less of an issue, because horses are willing to put up with much physical discomfort as long as things make sense. As long as for every stage of training, riders take into consideration the essentials such as physical and mental maturity of the horses. But the average age of competition dressage horses (not Arabians) in Europe a couple of years ago was eight years old - disposable beings.
There are so many horses that are not good enough for performance sports, are sent off to slaughter or are just neglected, but do we attempt to only produce a realistic number of horses, she asked? Oh no, instead we breed by ever more artificial means, with stallions often used for breeding when they are much too young, with mares also often harvested mercilessly for embryo transfer, all for money's sake. With embryo transfer not just in rare cases where a rare strain or bloodline needs preserving - which might justify embryo transfer on a small scale. With carrier mares being disrespected - it is worth remembering that surrogate dams do contribute to the physical and mental make-up of the creature they carry.
There is however good news, she said. There is at last a large and serious outcry about show abuse. It may bring change by empowering officials, from judges to DCs to ring stewards, to being far more effective.
She urged the audience to comprehend that when horses refuse a request it is usually because they physically cannot do it. If horses did not have a basic willingness to work with humans, they would not throughout history have been such wonderful companions, so patient and tolerant of our mistakes or so willing to be our workmates and our friends.
We all know that horses are also healers, and Arab tradition tells us that they are comets combating negative forces, she said. Which is why Princess Alia wished to end her presentation with a few happy stories that happened at the Growing Together project run in Jordan for autistic and other disabled children. The children meet the horses, mostly retired or rescued animals, and within minutes each child has been "chosen" by one of the horses. The program develops at the individual speed required by each child. There have been some minor miracles, like that of a little boy who had never spoken at all. He was walking along with "his" horse, past an enclosure of wildlife rescued from local zoos, when he pointed at some wolves watching through the fence and said "wolf!". He is probably the first child ever to be praised for "crying " "wolf".
On that note, Princess Alia ended her passionate and moving speech with a short film featuring how the relationship between horses and humans can be.

Emma Maxwell, the successful breeder and trainer, and daughter of Joanna and the late Pat Maxwell from Lodge Farm Stud, also gave an extremely interesting and thought-provoking presentation titled The importance of temperament as part of Arabian breed Type.



Maxwell pointed out that from the way Arabian horses lived with the Bedouins, they developed two very different sides to their nature, the courage –for war - and the quietness – for dealing with "their" humans. She also pointed out that temperament traits such as these are hardly considered nowadays when making breeding decisions.
Outside the breed Arabians often have the reputation as 'crazy Arabs', which may have something to do with a perception problem: people see an animated horse and believe him to be difficult, while in the Arabian world, the same animation is seen as type.
The topic of temperament is, of course, very complex, we lack a subjective scale for describing and measuring temperament, and there is the problem of that grey area between learned and innate behaviour.

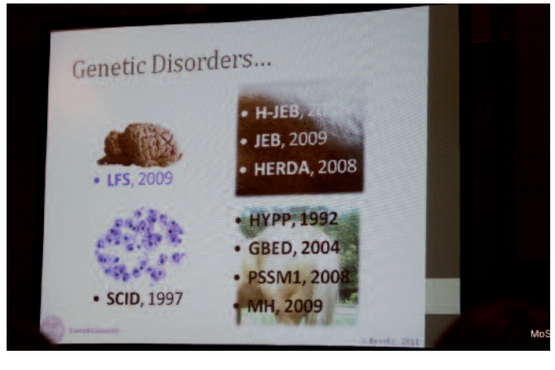
After presenting historic and present studies on temperament assessment by way of different behaviour traits, Maxwell used one of the studies at length to introduce different behaviour traits, summed up under six headings: dominance, anxiety, excitability, protection, sociability, and inquisitiveness.
Some examples: Breeding for presence can lead breeders to always favouring EXITABLE horses. A tense horse may look at first glance like a horse with real presence, but tension is not charisma. Arabians are noted for INQUISTIVENESS and scored the highest for this trait in the breed study. IRRITABLE horses seem to have thinner, more sensitive skin than other horses and this ticklishness makes them intolerant.
Temperament is a complex trait, Maxwell concluded, and currently heritability studies are in their infancy. The whole topic deserves much more attention from breeders.

The Wildlife of Qatar was presented to the audience by **Mark Strickson** and **Frances Gillespie** with a combination of Mark's delightful documentary film of „Life in the Sand“ and Frances's slide-show. Both were fascinated by the extraordinary animals living in the desert and delighted to share their fascination with the conference participants. Short films with gripping music made the audience feel they were standing in the desert sand and watching animals such as the Oryx antelope, who raises its body temperature during the day in order to sweat less and save water. After all, the famous Arabian horses are not the only products of the desert that deserve our attention.

Dr. Samantha Brooks

Assistant Professor Samantha Brooks of Cornell University, USA, headed her speech "Multipurpose genes: Tips and tools for Breeders & information on 2 new research projects on Laminitis and on the Population Structure and Ancestry of the Arabian horse."
She started by reporting on the first successful use of genetic testing in the form of the "Equine SNP50 Chip". This led to the recent development of a genetic test for Lavender Foal Syndrome, which is one of several tests now available at the Animal Health Diagnostic Center at Cornell University, where not only testing is done, but full veterinary diagnostic services on the tests, tightly quality-controlled, are provided.
Gene studies in horses have often focused on color issues in the past, Brooks said. Today's studies build on that, as many pigmentation issues (positive traits) have correlations to health issues (negative traits) such as the lethal white gene that overos also carry, but only one copy of it. Genetic testing provides breeders of that colour with the means to manage the risks well, preventing unwanted suffering of foals and broodmares. Dr. Brooks also talked about multipurpose genes, using as her example the MC1R gene responsible for chestnut coat colour. MC1R acts as a switch, turning on and off the production of black pigment. In the chestnut allele, a mutation has damaged the function of this switch, preventing the production of black pigment, and revealing only the remaining red pigment in the hair coat. Another example is chestnut colour, a recessive mutation of the MC1R gene disrupting the function of a receptor that would usually work like a light switch: if it's on, colour-producing cells are instructed for "black", and if it's off, the cells produce chestnut for lack of the "black" information. Horsemans' wisdom however, has long attributed a flighty and excitable nature to the chestnut mare and perhaps we can blame this on the biology of her MC1R allele.
The gene for the colour "grey" also has a dual function: as it primarily regulates growth and division of pigment cells, it is also responsible for the high occurrence of melanoma in older greys. For the "dominant white" colour to occur, about 15 gene mutations may serve, 2 of which are present in Arabian horses - and all of which are suspected to have multiple functions and to be lethal to embryos when homozygous.

Skin and muscles are very frequently affected by malfunctioning genes in the horse - and are highly valued by breeders for their various functions. Brooks illustrated her point by reporting on the frequency of HYPP (hyperkalemic periodic paralysis) in the American Quarter horse population. The responsible alleles are by no means equally frequent in different subgroups of the QH, but what is alarming is that in the subgroup of Halter QH, "carrier horses" with at least one copy of the gene made up 8% of the American population in 1992 - and 56.4% in 2010. Why did the allele frequency rise at such a striking rate? Brooks gave two probable explanations for that: breeders do use genetic testing to avoid mating carriers to carriers, but they don't remove carriers from the population for economic reasons; and a possible side-effect of the mutation, pronounced muscular development, is perceived as positive and rewarded by show judges. The example serves to highlight a common problem in breeding: you select for a desired trait and get an unfortunate side-effect.
Cornell University runs a large ongoing project on genetics in the Arabian horse, focussing on genetic ancestry on the one hand, and on complex traits on the other hand. Disease suscep-



tibility is one of them. Take laminitis: it is the second most frequent cause of death in horses and directed Brooks to metabolic syndrome as very recent research has shown that artificially raising the insulin level in a horse triggers laminitis. (Because of that, scientists think that horses could serve as a model for researching diabetic issues in humans, which opens up new channels for funding research.) As Arabian horses in the desert were adapted to very lean diets, they are particularly susceptible to metabolic syndrome and cushings syndrome as a result of overly rich diets. The results of genetic testing look extremely optimistic: less than a dozen markers in the genome may be enough to pinpoint a susceptible horse. It will take much longer to understand how the genome is contributing to metabolic and cushings syndromes. -- Another area of study is Equine Sarcoidosis, which has an interesting tie to another condition found in the Arabian horse: Severe Combined Immunodeficiency. Among SCID carriers who are not phenotypically affected, skin tumors are 200% more frequent than among non-carriers. The gene for skin seems to be impaired by the SCID mutation. -- Another complex trait under study is athletic performance. Sorry to say, there is no single "speed gene", said Brooks, but rather many genes, and training is still most influential.

As to genetic ancestry, the Arabian horse is particularly interesting, as this breed has the oldest records available. Research wants to highlight how Arabian horses have segregated into subgroups and families. Brooks showed that the Egyptian subgroup is indeed genetically clustered on its own branch of the Arabian family tree. Genetics open up the opportunity to read the history of the Arabian horse not through - possibly faulty - pedigrees on paper, but through the genetics that are actually passed down from parent to foal. Brooks also demonstrated that the Egyptian subgroup can be compared to other groups via its special distribution of certain genetic markers. Individual horses can be compared to the clustered markers of their group, which may serve to prove they have genetic material that does not normally exist in this group.

The university group is also beginning to investigate complex traits such as conformation, Brooks reported. Already, 1600 horses representing 70 different breeds have been tested using a series of 35 body measurements. Conformation has an obvious impact on any horse's ability to function as an athlete, with the most variable component being body height, which also has the advantage of being easily accessed. Gene loci for height have been identified.

As a future outlook, Brooks was positive that more and more individual horses will be genotyped, and Cornell University will be excited to have more Arabian horses to work on. Currently, about 50.000 genetic markers are checked - the complete genome of a horse with about 2.7 billion genes is simply too extensive to work with. Practical applications of the genetic knowledge proposed by Brooks were tests for predisposition to diseases and conformational faults, enabling breeders to adapt the environment to the needs of a horse; and gene-targeted treatment of conditions where the whole biological pathway is known. Genetic studies should make the job of horse owners easier and more enjoyable, and ultimately help the horse.

Cynthia Culbertson

From research into the future, back to archeology: the next contributor was Cynthia Culbertson, still known to most of the participants as the curator of the successful exhibition „"A Gift from the Desert: the Art, History, and Culture of the Arabian Horse" that had taken place during the World Equestrian Games in Kentucky in the Kentucky Horse Park in 2010.

Her presentation on "The Arabian horse in Islamic and Orientalist Art" was particularly appropriate at this conference, as she put it, because the conference's host country of Qatar has demonstrated such tremendous dedication and vision in the world of museums and art. She recommended her audience to see the extraordinary Museum of Islamic Art as well as the Orientalist Museum.

The archetype of the Arabian horse first appears 3,500 years ago in Ancient Egypt, Culbertson demonstrated. Reliefs from that time give proof that horses were pulling chariots as well as being ridden, and the ancient artists clearly distinguished between stocky-bodied, stiff-maned, broomstick-tailed donkeys and their

Carle Vernet Mameluck en retraite_Aquatinta 1815 Archive Dr. Karin Thieme

Victor Adam Nijid 1840, Archive Dr. Karin Thieme

Kurtz und Zwecker Caroussel, Archive Dr. Karin Thieme

crosses on the one hand and fine-boned, arched-necked, high-tailed Arabian type horses on the other hand.

The precise origins of the Arabian breed, however, still remain a mystery. What is certain is that the true Arabian breed emerged from the geographic region of Arabia, as the Arabian horse is clearly identifiable in rock art dating from several centuries before the coming of Islam.

In Islamic art, the depiction of humans and animals was traditionally discouraged throughout much of history. Fortunately, there are still many exquisite examples of horses in art throughout various Islamic dynasties. Culbertson presented a fascinating array of this kind of artwork, categorizing woodwork, metalwork, ceramics, glass, textiles, paintings, and illuminated manuscripts.

Examples contained exotic scenes such as a mounted falconer on a prancing horse, mounted horsemen picking dates, hunting scenes with cheetahs perched behind the saddles of Arabic horses and Saluqi hounds accompanying the riders.

In much of Islamic art, a relatively small horse is depicted in relation to the rider – consistent with the smaller height of the Arabian breed. Some of the metalwork examples led Culbertson to state that there is no one alive today with the skills to execute such exquisite pieces, often laden with an unbelievable amount of explicit detail which must have been observed by the artists in their life. A tail knot on a horse, a horse resisting the bit, horses wearing bridles with curb bits, horses equipped with decorated neck bands, breastbands and colorful saddle cloths.

In studying these scenes, little pieces of everyday life appear from the mist of time: the amount of training it must have taken to make a horse accept a cheetah on his back, and the horse's courage… Or a piece from the 13th century, mounted warriors shooting arrows at a high target, which proves that this game, known as qabaq, was played even then.

Furusiyya or horsemanship manuscripts are a favorite topic of Culbertson's, she explained: they include a lot of information about horses and horsemanship in the context of the Muslim knight. There is an early furusiyya manuscript that specifies different training methods to be used for purebred Arabians than other horses. And many of these manuscripts also make a clear distinction between the asil Arabian and other horses.

There are also several books in early Islamic literature about animals, their habits and care, including veterinary treatises. An impressive example was a veterinary manual from the year 1209 showing a man palpating a mare for pregnancy, with the technique exactly the same as in modern veterinary medicine.

Beginning in the 1500's, horses became solo subjects worthy of their own portraits. These portraits often feature intricate details of tack, and there can be no doubt that the tack as well as the horses were accurately depicted. Arabian horses are easily recognized in much of the artwork Culbertson presented, with details such as a small head and muzzle, and tiny tipped ears. In the genre of painting known as Orientalism, on the other hand, many of the paintings were simply artistic fantasies that fit a stereotypical version of the region. However, many great masters of the genre in the mid-19th century travelled often to North Africa and the Middle East to paint from life. So from them come correct painted records of the horses of the region.

Culbertson showed various examples of paintings in which Arabians were easily recognizable: a grey Arabian completely different in type and demeanor to the chestnut French cavalry horse depicted just beside him; horses with dished faces, large eyes, and small ears; more than 40 original paintings portraying the Arabian horses of a Royal stud; horses with strong Barb characteristics from North Africa, where both the Arabian and Barb breeds were found; a caravan scene where the Barb horses in the foreground contrast strongly to the smaller and much more refined Arabian stallion being led along in the background.

The art of lithography helped popularize the Arabian, Culber-

Carle Vernet Mameluke on galopping horse 1821, Archive Dr. Karin Thieme

Persepolis, Ancient Persia

tson explained, as lithographs were more widely available than original paintings. Many of the European artists who depicted the Arabian horse in a desert setting also reflected the close relationship between the Arabs and their horses. This relationship was often met with astonishment by the Europeans who were not used to this sense of camaraderie and trust between horse and master. Culbertson emphasized that the work of the Orientalists not only gives the viewer an idea of the horses of the time, but also important insight into the unique relationship between the Arabs and their horses.

Dr. Christina Hebel

Al Wabra Wildlife Preservation

Back into the Here and Now in Qatar: veterinary surgeon **Christina Hebel** had the last presentation and reported on her experiences at Al Wabra Wildlife Preservation, Sheikh Saoud Bin Mohammed Bin Ali Al Thani's private breeding & research center in the desert of Qatar where experts are highly successfully engaged in protecting and breeding desert animals which are on the brink of extinction.

Discussion and Voting

After the presentations on genetics, Nagel asked for an open discussion to share opinions.

Genetic testing for hereditary disorders is an important field entirely. He asked his audience to go in favour of the breeder, in favour of the good of the breed, in favour of the best way forward. For opinions and contributions on that issue, he asked to concentrate on CA. "Test before we breed" was a comment that was heard often in the discussion to come. The chairpersons clarified that WAHO's policy is to test before we breed. The consideration is that most registries have different ways to go about this. In one delegate's words, "it would be fantastic if WAHO would lead the responsibility with the individual horse and be positive about this and not let the members do as they please. Let the registries guide the way the country wants to take, and I think it's in the WAHO constitution that the registries can't have their own ways." There was opposition to public publishing of the results of genetic testing, however. "Any breeding organisation should inform and educate its members and give recommendations, but not publish" as one delegate put it. From several speakers, there was consent that breeders need more information on the best way to act with a horse tested as a carrier. "Only breed carriers to clear horses" was the unanimous answer of the scientists present. Little help can be expected from unspecialized veterinarians. There was an encouraging report from Switzerland where mandatory testing of all horses has resulted in a 99% decrease of SCID in the course of the last ten years, which is why the Swiss are now considering to do the same for CA. With genetic testing, "we have a wonderful tool in our hands", stated the delegate, "Everybody should do it, for the future of the breed." He received the loudest applause of the session and lots of backup from other delegates. One of them added that in addition to breeding only clear horses to carriers, Dr. Bowling's demand to "reduce the incidence of carriers in the breeding population" is "a straightforward suggestion which I think WAHO needs to transport to all members".

Nagel replied that personally, he fully agrees with Bowlins's message. In order to reduce the loss in genetic variety, he supports the concept of using clear offspring of important carriers for breeding. One delegate summed up what was probably on many delegates' minds: "it's an ethical and moral obligation of every breeder anyway". This delegate went on to ask why WAHO "would wish to get involved when WAHO's only function is to make sure the horse is accepted under WAHO rules?" Another delegate answered that question with his own comment: "Organisations need to make rules for their members, that's their responsibility, based on what they think is best, not based on the little they see around them."

Nagel was very pleased to find that, in summary, there was quite unanimous feeling about this subject. "It makes us (WAHO) even stronger when we can do what you, our members, would like to see us do." Concluding the three days of presentations and discussion, the individual items were put to the vote, which was chaired and presented by Mr Peter Pond who had, as Vice President of WAHO, expertly moderated the final voting and discussion of the conference. Everybody was aware that for any responsible breeder of Arabian horses, testing for genetic disorders is the thing to do in times to come. As several countries already made testing of horses mandatory if they are to be registered in the studbook, WAHO restricted themselves to a strong recommendation to test for CA and SCIA, leaving the jurisdiction on mandatory or voluntary testing to the national registries. In this context, it was seen as necessary to find a new WAHO definition of what is an Arabian horse. The new wording: „It is a mandatory WAHO rule that a horse entered in a studbook or register for purebred Arabian horses fully accepted by WAHO, must be acceptable to the Registration Authority of all WAHO members and must not be rejected on a pedigree basis, nor on the basis of genetic test results, nor on the basis of phenotype." It was also decided that those test results will not be printed on any official document, such as passports and registration papers, nor be published in any official studbook or register. Furthermore the Executive Committee discussed the issues of retrieving eggs from dead mares and of fertilizing oocytes outside the body of the mare, as methods of producing embryos for immediate transfer or freezing for later transfer. They concluded that WAHO should make the following rule, which was passed and accepted by the overwhelming majority of the delegates:

"1. It is a mandatory WAHO rule that any Arabian of any age produced by *post-mortem* collection of oocytes must not be registered under any circumstances.

2. It is a mandatory WAHO rule that any Arabian of any age produced by any method of In Vitro Fertilization (IVF) must not be registered under any circumstances."

The rule on ovum pickup is to take effect from 2013 (for southern hemisphere breeders the date is 1st August 2013, for northen hemisphere it was 1.1.2013), so as not to provide a hardship for the owners of embryos already produced that way. It is also the strongly recommended, that from 2013 on, no more than two foals per mare and year can be registered including one or two embryo transfer products.

In his closing comments, it was important to Dr Nagel to express his thanks. He thanked the first-time participants of the WAHO conference, for whom he hoped their expectations had been met. He reminded them that WAHO is an apolitical organisation representing 70 countries, without preferring any of them. All members have the same rights, they are all important to WAHO, and they were all together in Doha to keep the Arabian horse alive and make sure this extraordinary breed has a good future for a long time to come. He expressed his gratitude to the three possible locations for the next WAHO conference, as the effort of a lot of people in the background is what makes the meetings possible at all. Finally he thanked all of the participants for their time and their efforts. He had particular thanks for the people who gave the highly educational presentations, and for the people of Qatar who made the conference possible, as well as for the dedicated people in WAHO who give a lot of their time for the people that make up this organisation. With the words "I hope you will remember this meeting and all the decisions we made. Hopefully we will use them well.", he bade all participants to return well to their homes. ■