

The 2019 Bartlett Address
Comparative theriogenology: international perspectives
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Introduction

Imagine my great surprise when, instead of telling me about his latest cases or adventures in reindeer theriogenology, Dr. Isaac Bott unexpectedly informed me that I was selected for the Bartlett Award. I was speechless. It is beyond my wildest dreams to be selected for such an honor. I am grateful and humbled knowing there are a great number of deserving people within our society and college. As is customary, I am asked to stand before my peers and friends and deliver the Bartlett address. I would like to share with you my experiences over the years and the impact this specialty has had on my professional and personal life.

Beginnings

My family has a long agricultural tradition. Our farms included not only crops and tomatoes but also a little bit of every traditional production animal species (cattle, sheep, and goat). My main interest was horses. My father was a member of our hometown racing commission (one of only 3 race tracks in the country at that time). Therefore, I grew up involved with thoroughbreds and Anglo-Arab breeding and racing. I spend all my free time sailing, riding and going to the track weekly during the racing season. I have to admit that I was – and still am - very fond of cats. I owned a breeding colony of Siamese. It was no surprise to anyone that I ended up selecting veterinary studies when I graduated from high school. I obtained my “Doctorate en Medecine Vétérinaire” in 1980, from the only veterinary school in Morocco, the “Institut Agronomique et Vétérinaire Hassan II”. The 6 year education program paralleled that of European schools and in fact many of my professors were from French, Belgian or German veterinary schools. The veterinary curriculum was developed with novel ideas and included amongst other subjects a requirement in rural sociology, economics, and statistics, for which I remain very grateful because of how much this background helped me later. I developed an interest in reproductive medicine in my 4th year of veterinary medicine, guided by my first mentors, German veterinarians Dr. Gero Hanschke and Professor Dr. Peter Glatzel with whom I had my first publications. Dr. Peter Glatzel was my main advisor and mentor for my DVM thesis which allowed me to introduce a structured breeding soundness examination for stallions at the National stud farms and particularly for the Barb and Arab-Barb horses for the first time. I also became involved in donkey semen cryopreservation from two endangered species the Catalan and Poitou which were heavily used for mule production. This experience was the final impetus to become a theriogenologist. Thanks to the support of my advisor, I was hired as an instructor at the veterinary college, where I practiced as a clinician in the area of reproduction which included all aspects of reproductive medicine and surgery, neonatology, and bovine mastitis. During these years and under the leadership of Professor Lahlou-Kassi, I had the opportunity to meet many reproductive specialists from around the world who were interested in Moroccan prolific sheep and horses. My professional development did not become a reality until I obtained a scholarship to go to the University of Minnesota for advanced training through a US-AID program.

Minnesota experience

What a wonderful experience it was! I arrived in Minnesota in July 1982, and after a short intensive English program I started my graduate studies in the Theriogenology section. There I found the

perfect union between a great theriogenology faculty (Drs. Ray Zemjanis, Brad Seguin, Shirley Johnston, Norm Williamson, and Mel Fahning) and a great reproductive physiology faculty in animal science (Drs. Ed Graham, Bo Crabo, and Al Hunter). All these people have greatly and positively impacted my learning, professional and personal growth. I was most fortunate to get involved with faculty from other units notably Dr. Ashley Robinson and Dr. Don Johnson who mentored me in epidemiology and international work, and Dr. Al Weber who introduced me to the fascinating world of cytogenetics. I was surrounded by a wonderful group of residents and graduate students many of whom have become successful theriogenologists and leaders in the field (Drs. Harry Momont, Farhat Vahdat, Hisham Fahmi, Fran Smith, Doug Freeman, Carlos Gradil, Miguel Fortin, Rebecca Davies, Juan Samper, Peggy Root, Stefano Romagnoli, Juan Romano, Jane Barber, Gary Nie, Atushi Tajima, and Sue Swanson). It is within this group that I learned the science of gamete physiology and cryopreservation, fundamentals of clinical theriogenology and was initiated in advanced techniques in theriogenology which I put into practice as soon as I got back to Morocco upon finishing my MS degree and completing my prelim to continue my PhD research in Morocco.

Back to Morocco

Education that I received in Minnesota opened many doors to me and within a few months I was in charge of the cryopreservation lab and equine reproduction at my school. I was very fortunate to have the confidence of several large equine (Royal stud farms, National Stud Farms, Equestrian Federation) and bovine (Santa Gertrudis ranches and dairies) operations. I met other mentors who helped me along the way, in particular Dr. Abdelhafid Yacoubi who included me in the reproductive program of a large herd of Santa Gertrudis (Ranch Adarouch). From 1985 - 1989, I participated in training of veterinarians and providing clinical services to large and small animal clients. However, I believe that my major contribution was to serve as a mentor for 2 women; Drs. Samira Manar and Nadia Lotfi who wanted to work with large animals and who are now leaders in their respective fields (small ruminant reproduction and bovine reproduction). I was fortunate that the field was wide open to engage in many activities in research and development. I got involved in dairy cattle management, helping to introduce DairyChamp[®] (which I translated to French), extension activities (ram breeding soundness examination) and even served as the Director of the first veterinary program in Peace Corps. I was fortunate to be requested to help with reproductive issues on wildlife at the National Zoological Park working on large cats (particularly the Barbary lions), gazelles, buffaloes, and other creatures, thanks to my friend and colleague Dr. Brahim Haddane. I left Morocco in the winter of 1989, with the promise to then General Director of the IAV-Hassan II, Dr. M'hamed Sedrati who was a great mentor and supporter, to continue serving the institution whenever needed. Did I say that in addition to wanting to discover new horizons in my discipline, I have also left something very dear in Minnesota? My soon to be wife Brigitte.

Back to Minnesota

I was welcomed again into the theriogenology team at Minnesota where I worked as a clinical assistant professor and helped with Dr. Graham's research and teaching as he was in fading health. The support I received in those uncertain years will remain forever engraved in my memory. It is during this second "tour" that I had the great chance to meet and learn from Dr. Patty Olson and Dr. Jerry Olson who mentored me along with all the other faculty for the theriogenology boards. I kept my contacts with my Alma mater and continued to provide lectures and even initiated a series of books on Equine Reproduction in French.

Abu Dhabi years

In the fall of 1991, I was asked to travel to Abu Dhabi for a consultation on a project on camel embryo transfer that my colleague, Dr. Abdelhaq Anouassi, had initiated with the veterinary technician I trained (Mr. Mustapha Adnani). I had never worked on camels before, except to help colleagues with ultrasonography for their research. Dr. Anouassi had done tremendous work at INRA-France on camel reproductive endocrinology and I was bringing a clinical approach to this lab. Together, we spent long days working on development of reproductive evaluation techniques in camels which allowed us to publish a book on camelid theriogenology after 7 years. We expanded the labs to include equine with the collaboration of friends (Drs. Ahmed Abdelhamid, Kamal Pasha, Andrew Daglish, and Peter Davis). My only regret during those years is not to have published more on our clinical observations on camels and equine, notably outbreaks of habronemiasis in stallions and the effect of high heat and humidity on reproductive function in horses. I was lucky that my contract was only for the breeding season which left me 4 months to travel back to Morocco and the USA to work on my publications and to teach. Throughout that time, I wanted to return to my passion: veterinary education and research, and was looking for a position in theriogenology. A break came finally in 1998 where I interviewed both at the University of Massachusetts equine reproduction (Dr. Doug Freeman, Chair) and at WSU for a dairy cattle position (Dr. Shirley Johnston, Chair). I was offered both but opted to go to WSU because it is was tenure-track and was a veterinary program which would allow me to continue my involvement with clinical training and research.

WSU: a new beginning

I arrived Pullman in the summer of 1998, already 20 years ago! Dr. Mushtaq Memon, was mainly doing small animal theriogenology and Dr. Duane Michelson was in charge of bovine reproduction. I thank them both for their encouragement and for introducing me to their clients. My position was in Field Disease Investigation Unit (FDIU) as a reproduction specialist. Having had most of my work experience outside of the USA university system, I accepted (not without a challenge to my pride, I have to admit) to start from the beginning and go through all the painful processes of pretenure, tenure, promotion etc. I was very lucky to have started with FDIU under the leadership of Dr. Clive Gay. It was a wonderful opportunity for professional growth and I am very grateful for his guidance as well as that of all the members of the team (Drs. Larry Fox, John Gay, and Dale Hancock). I was able to participate in his research on lupine toxicosis. The work in the FDIU was exciting, but my heart was in developing a clinical theriogenology program. I was allowed under the leadership of Dr. Warwick Bayly to move into the clinic and develop the comparative theriogenology service. Obviously, no service can be developed without the support of other critical clinical specialties and I am indebted to my colleagues in equine and agricultural animal medicine and surgery for their support. In particular, Dr. Claude Ragle was very supportive and became a family friend, kidnaping me once to go on one of his Mule rides in the wilderness. During my tenure at WSU, I was able to make progress toward tenure due to the support from colleagues from the college and from Animal Science, in particular Drs. Jerry Reeves and Phil Senger. It is the support of these fine colleagues and that of the students who honored me with so many teaching awards including the Norden Distinguished Teacher Awards in 2001 and 2005 that allowed me to “survive” the pretenure part of my career.

The comparative theriogenology program began to strengthen in 2007 when Ms. Shirley Sandoval joined me as the lead veterinary instruction technologist. Her practical experience and her passion for her work allowed us to provide several services. We initially started capitalizing on the lack of services for camelids. I had never touched an alpaca prior to my arrival to WSU and soon we were receiving referrals from several states. From there we went on to develop an equine theriogenology program, then a small ruminants service. The program continued to strengthen thanks to wonderful

residents and graduate students (Drs. Cheryl Fite, Jacobo Rodriguez, Lisa Pearson, Yessinia Picha, Aymen ElZawam, Hamid Alkar, Alexis Campbell, Salman Waqas, Michella Ciccarelli, Agustin Ruiz, and Cristian Patino). All had an impact on the program that went beyond my expectation. I pause here to thank Dr. Harmon Rogers who involved them all in small animal theriogenology.

In research, I continued working with my colleagues in Abu Dhabi on camel projects, but on campus I was fortunate to be included in research programs of Dr. Subramaniam Srikumaran on Big Horn sheep and Dr. Jon Oatley on spermatogonia stem cells transfer.

My return to the US allowed me to finally be able to actively participate in the Society for Theriogenology and the American College of Theriogenologists, and later the Theriogenology foundation. It was a great honor for me to serve in the leadership of these organizations. This allowed me to get to know other clinicians and researchers from across North America and beyond, with similar interest. I felt and still feel welcomed by all.

On international work

Being able to participate in research and continuing education abroad is certainly one of the highlights of my life and professional career. As a young veterinarian in Morocco, I was on the receiving end of teaching from visiting professors and scientists. It is only natural that I would want to return the favor. I was given this opportunity by several people as I continued to learn. First and foremost, I never lost contact with my Alma mater which continues to nourish my professional and personal life and where I continue to collaborate in teaching, research and continuing education with colleagues and former students. It is in the spirit of international work and thanks to my continuous involvement with veterinary education in North Africa that I was able to associate some colleagues from WSU and other theriogenologists such as Dr. Carla Carleton to my work there.

One of the activities I am most proud of is that I was able to use my experience and all I have learned on camels in the Middle East to train wonderful veterinarians and technicians from the 91st and 96th US Civil Air Force Battalions, who in turn could help many people who depend on these animals for their livelihood.

I thank Professors Jorg and Christina Aurich for involving me in their equine course and resident seminars in Vienna. Professors Luis Losino and Marcelo Miragaya have been wonderful friends and made me discover many aspects of equine and camelid science in Argentina and Chile. Professors Julio Sumar and Edwin Mellisho provided opportunities for involvement in Peru. Dr. Marco Alvarenga gave me the opportunity to discover Brazilian equine industry. These international events allowed me to share experiences with several great theriogenologists. I have often wondered why I got all these invitations. I always came to the same conclusion, there are aspects of these international interactions that go beyond technical or scientific expertise. People like to share their experiences in a respectful and fun atmosphere. This is why I always try to involve my previous residents in international work. I am very grateful to Dr. Jacobo Rodriguez and Dr. Alexis Campbell who help me with camel projects in Qatar.

International involvement includes also the ability to receive overseas students. Unfortunately, such experiences are slowly disappearing particularly for students from developing countries. At WSU, and under the leadership of Dr. Erik Stauber, I was fortunate to work with international veterinary students who later become theriogenologists, Drs. Natali Krekler, Maria Ferrer, Gislaine Dujovne. I know that this an effort of the Theriogenology foundation through the Zemajin funds which has benefited one of my graduate students (Dr. Y. Picha).

Concluding remarks and pet peeves

I cannot end without sharing some pet-peeves that I have developed over the years. The list is long but I limited to top 4. 1) Do not use the verb “utilize” when “use” is sufficient, 2) we do not do

“preg check” nor do we “sleeve’ or “arm”, we do pregnancy diagnosis and reproductive evaluations, 3) we do not do rectal palpation but “transrectal palpation”, 4) Last, it may not be true for all but when you are so invested in your specialty, everything that touches it **IS** personal.

I have to conclude with some sort of words of wisdom. For me it is simple: what goes around comes around, so I tried to offer young aspiring theriogenologists what others had offered to me throughout my career. I have been asked frequently in recent months about when I will be retiring. My answer is, why retire from such an exciting profession and specialty? Many of the concepts of what theriogenology is, laid out by my predecessors, still apply. I urge all theriogenologists to think big, think international and may you all continue to enjoy our specialty in health and happiness!

