ARF
ALPACA RESEARCH FOUNDATION

ANNUAL APPEAL 2013

ARF PRESIDENT'S REPORT

At this time each year we at the Alpaca Research Foundation (ARF) like to communicate with you, the folks whose donations to ARF enable us to support alpaca research projects we consider valuable to the North American alpaca community. Since some of you may be learning about ARF for the first time, it is useful to briefly describe what we do. ARF is a 501(c)(3) nonprofit corporation whose goal it is to encourage and fund scientific research aimed at benefitting the North American alpaca community. 100% of donations to ARF go to support research projects. Our working capital is derived from income generated by our research account and is never taken or "borrowed" from our research funds. ARF maintains a close relationship with the Morris Animal Foundation (MAF), the largest supporter of companion animal research in the world. We play a supportive role at the Llama and Alpaca Division at MAF both by setting priorities for research projects as well as by utilizing ARF funds for some of the projects.

Those of you who would like more in-depth information regarding ARF can visit our website at www.alpacaresearchfoundation.org and/or go to our Facebook page at www.facebook.com/alpacaresearch. There is a great deal of information on both of these sites regarding ARF. Please feel free to ask questions and make comments on both of these sites. Donations can be made directly from our website. Also, on the website there is information regarding past and present research projects as well as the "Make a Difference" section where the many options for helping support camelid research are delineated. If there are specific studies that organizations or individuals would like to help support, that support will be acknowledged in the publications which result from that project.

There are presently a number of active studies in 2013 which should be mentioned.

An ongoing project scheduled to be completed in 2014 is looking at the use of a medication (exenatide) which can be used to treat high blood sugars in sick alpacas. It is thought to be beneficial because it is just as efficacious as insulin but does not cause the hypoglycemia (low blood sugar) often associated with insulin therapy.

ARF has just approved funding for four research projects to be started in 2013.

One study will be investigating the agouti gene, a gene responsible for color variation in numerous animals and very likely responsible, at least in part, in color determination in alpacas.

There is preliminary evidence to indicate that vitamin A metabolism is linked to craniofacial development in alpacas. A research project looking at the genomic region associated with vitamin A metabolic pathways has just started with the goal of finding the cause of choanal atresia in alpacas.

Many alpacas admitted to veterinary hospitals are anemic and the possible causes of the anemia are quite diverse. Effective therapy relies on the specific abnormality. A study has just gotten under way to evaluate numerous factors associated with anemia in sick alpacas and comparing those to normal controls. These results should help better classify the problem and provide more precise treatment.

Over the years the use of anti-parasitic medications in alpacas has been fraught with complications, especially the evolution of drug resistance in the worm being treated as well as others that are not the specific target (collateral damage). A study involving a long-acting dewormer has just begun. This medication, if successful, will decrease the frequency of dosing significantly and, when used appropriately, will be effective on the one hand, and decrease the chances of causing drug resistance on the other hand.

In our letter one year ago we lamented the fact that donations to ARF had decreased by 50% in the last few years and, unfortunately, that trend persists. We will continue to gauge our funding based on the monies we have available, but that means that some worthwhile projects may not be funded. The ultimate beneficiary of the research funded by ARF is the alpaca community itself—that means you. We hope you consider donations to ARF both as individuals and organizations. Often there are ARF representatives at AOBA sanctioned shows who are able and willing to answer questions and spread appropriate information and we urge you to speak to them. We are grateful to the numerous organizations and individuals, many of whom have been deemed "ARF Angels," who have consistently provided us with the funds necessary to adequately do our job. We hope they continue to support us and that others, who have not, can find the wherewithal to do so. Our vision is simply to provide the best for our alpacas as humanly possible.

Sincerely,

Alan ("Abe") Rosenbloom, MD
President

VOLUNTEER

The ARF Development Committee needs volunteers to help ARF in a variety of different ways to get its message out to the alpaca community and to help raise funds to support research studies that benefit the North American alpaca industry. The ARF Development Committee meets once a month by teleconference for lively and friendly discussions. Any amount of time you can give us would be appreciated. For more information please contact Patricia Craven at pacraven1@gmail.com.

CURRENT RESEARCH

Studies which have been completed in the last year include

- The assembled alpaca genome is now available and searchable online through publicly available US Government websites. It contains 2,172,191,320 bases. A few hundred genes have been identified and over 4000 markers with more to come. The availability of this alpaca genome map will lead to development of genetic tests for inheritable diseases and traits.
- Development of reagents and an immortal alpaca cell line to detect viral pathogens. In order to study a virus you need to be able to grow a sufficient amount of it in vitro. An alpaca cell line provides an ideal host for the growth of viruses that infect alpacas.
- Pharmacokinetics of midazolam (sedative/anesthetic) in alpacas. This study determined the correct dosage and timing for the use of midazolam in alpacas.
- Pharmacokinetics of flunixin (anti-inflammatory medication) in alpacas. This study determined the correct dosage and timing for the use of flunixin in alpacas.
- Purification of alpaca ovulation-inducing factor. This study identified Nerve Growth Factor as the substance present in alpaca semen that induces ovulation in female alpacas. A better understanding of how alpaca semen works will help in the development of protocols for artificial insemination.
- Complete genome analysis of the respiratory corona virus that caused a devastating breakout in 2007, showed that the respiratory virus was different from the enteric corona virus that causes diarrhea in alpacas. The two viruses have different binding mechanisms used to attach to the host cells. Therefore, an enteric bovine corona virus vaccine will most probably not induce a protective antibody response against the respiratory corona virus. The newly generated sequencing data provides a tool to help diagnose respiratory diseases in alpacas in the future.

ARF funds applied research. Basic research is funded if and only if there is a high potential for applicability in the future.

WHAT WOULD IT BE LIKE TO BE AN ANGEL?

Just ask Jan Sherrill of Celestial Alpacas. She never thought of herself as an Angel and was completely surprised to receive an Angel Award from ARF for her donations. Jan believed in the Mission of the Alpaca Research Foundation, to encourage and support scientific research which benefits the North American alpaca industry, primarily in the areas of alpaca health, husbandry, genetics, and fiber. She created the concept of the ARF Sustainer and set up a bill pay at her bank to send a specific dollar amount each month to ARF. Over time, the funds really added up without any extra effort.

It could be as little as $10 a month. If we all did this, think of the wonderful things we could accomplish to sustain the fine work that ARF does to help our alpacas live longer and better lives.

Set up your secure, monthly, tax deductible, sustainer donation on the ARF website or contact your bank. Remember, 100% of your donation goes directly to alpaca research.

This is what it would be like to be an Angel!

Studies that are ongoing at this time include

- Chromosomal abnormalities associated with infertility in camelids. This study is developing tools to look at markers of genes on chromosomes under the microscope. They have used this tool to visualize changes in chromosomes associated with infertility in alpacas. These findings could help veterinarians to diagnose and predict infertility in alpacas resulting in the saving of time and money for breeders.
- Genetic basis of choanal atresia. Studies are under way to develop a genetic test that will detect mutations associated with choanal atresia and ultimately be able to predict which alpacas are likely to have cria with this disorder.
- Healthy alpacas are closet diabetics, and there are times when their blood sugar or fat fractions become too high or they develop fatty liver. Using insulin to treat those conditions has been effective, but has the disadvantage of potentially dropping blood sugar too low. An alternate medication, exanatide, has been tested, and appears to be safer than insulin. The purpose of the present study is to test exanatide in a larger group of alpacas and establish its clinical usefulness.
- Study to determine the pharmacokinetics (drug uptake, distribution, and elimination) of a long-acting dewormer, eprinomectin (LongRrange®), following injection under the skin in healthy adult alpacas. This study of blood levels of a long acting dewormer will provide important new information about its potential utility in the management of meningeal worm and chorioptic mange.
- There are a variety of causes of anemia, requiring different treatment. In alpacas the cause is often not evident. This study will determine whether one of the most common causes of anemia in hospitalized humans, i.e. chronic disease and inflammation, rather than iron deficiency, could be causing anemia in alpacas.
- Study of the keratin genes that are responsible for determining fiber fineness in alpacas with the aim of developing a genetic test for fiber quality.
- Continued study of the genes that are responsible for coat color in alpacas with the aim of developing a genetic test to predict coat color.

ARF SUCCESSES

ARF has funded research that has led to:

- A next generation map of the alpaca genome becoming available on US government websites. This has spurred research into the development of genetic tests for commercially important traits and heritable defects, which will benefit the alpaca industry.
- Identification of the ovulation inducing factor in alpaca semen that can induce ovulation by intramuscular injection, as nerve growth factor.
- Development of appropriate vaccination protocols in alpacas for rabies, West Nile Virus, and eastern equine encephalitis.
- Determination of what works and what doesn't in the treatment of alpaca ulcer disease, a potentially devastating disorder.
- A better understanding of the etiology and treatment of hyperglycemia (high blood sugar) in alpacas, a serious complication with dire consequences if not aggressively attended.
- Improved methods for detection and treatment of M. haemolamae ("Epe"), E. mac, and the corona virus that causes acute contagious respiratory disease in alpacas.
- Proper dosage for treatment of alpacas with several drugs including the sedative midazolam, the anti-inflammatory medication flunixin, the antibiotics florfenicol and enrofloxacin, and the analgesic tramadol, to name a few.
- Methods for management of anthelmintic resistance in alpacas.

MEET THE ARF BOARD OF DIRECTORS

President, Alan (Abe) Rosenbloom, MD

Siler City, North Carolina, aarosenbloom@gmail.com

Abe has owned Black Tulip Farms Alpacas since 2000. He has been raising huacayas ever since. He has been a member of AOBA since 1997 and a member of ARI since 2000. He was one of the founding members of the Carolina Alpaca Breeders and Owners (CABO) and its first president.

Vice President, Lisa Williamson, DVM

Athens, Georgia, lisa1@uga.edu

Lisa is an Associate Professor of Large Animal Medicine at the University of Georgia College of Veterinary Medicine. She practices as a field service clinician, seeing horses, goats, sheep, and, of course, llamas and alpacas at their farms. Her research focus has been in the area of internal parasites that infect llamas and alpacas.

Treasurer, Patrick Long, DVM

Corvallis, Oregon, lama_dr@msn.com

Pat is a practicing veterinarian in Corvallis, Oregon. Llamas and alpacas comprise more than half of his practice. He is a member of the American Veterinary Medical Association and the Oregon Veterinary Association, and a board member of the North West Camelid Foundation, Alpaca Research Foundation, and the Morris Animal Foundation. He is coauthor of the book *Llama and Alpaca Neonatal Care*. Dr. Long has written many articles for *Alpacas Magazine* and has participated in several importation screenings for ARI. Dr. Long's areas of interest are herd health management, nutrition, and reproduction.

Secretary, Michelle L. Ing, DVM

Granite Bay, California, diamondmals@aol.com

Michelle graduated from UC Davis in 1996. She completed an internship in Equine Surgery in 1997 at Hagyard-Davidson McGee in Lexington, Kentucky. In 1998 she began her private practice with an emphasis in camelids in Spokane, Washington. Today she lives in Granite Bay, California, where her referral clinic is dedicated to camelids.

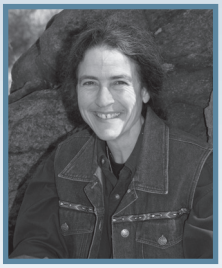
Patricia Craven, PhD

Ormond Beach, Florida, pacraven1@gmail.com

Patricia pursued a career in medical research in the areas of endocrinology and metabolism at the University of Pittsburgh for 35 years. She and her husband Bryan owned Cherry Ridge Alpacas. She has served on the board of directors of the Alpaca Research Foundation since 2001, and remains passionate about alpaca research.

Karen Baum, DVM

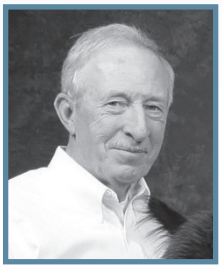
Huddleston, Virginia, lildoc@mindspring.com



Dr. Baum was formerly a member of the faculty of the College of Veterinary Medicine, Virginia Tech, where she founded the Large Animal Neonatal Intensive Care Unit and established the Lama Advisory Committee. She is now president and owner of Little Doc's Veterinary Care, a private large animal practice and clinic emphasizing llamas and alpacas. Karen has been on the ARF board of directors since its inception in 1997. She also serves on the BOD of the International Lama Registry (ILR). Karen is president of the International Llama Foundation (ILF), a nonprofit organization which is dedicated to educating people about camelids. Dr. Baum is past president and past vice-president of the Llama & Alpaca Association of Mid-Atlantic States (L.A.M.A.S.) and is enthusiastic about the llama and alpaca industries.

Randy Larson, DVM

Alpha, Illinois, larson26@winco.net



Randy Larson, DVM, operates Larson Camelid Services and was a partner in a mixed veterinary practice in Western Illinois for many years. As an alpaca owner and breeder with his wife Jan, his practice focus is now alpacas. He graduated from the University of Illinois, as did Jan and Randy's three children.

The ARF Board of Directors and Development Committee are all volunteers. ARF has no paid employees.

WHY DOES ARF FUND DRUG STUDIES IN ALPACAS?

Many of the studies that ARF funds are aimed at determining whether a particular drug has the desired effect in alpacas and if so, what the safe and effective dose is to obtain that effect. For example, midazolam is a drug that is used in humans to induce sedation before surgery, to reduce the amount of anesthetic needed during surgery and to impair memory of the procedure. Everyone would agree it would be beneficial to have such a drug to use in alpacas. However, the actions of drugs can vary dramatically from species to species. In horses, for example, even a low dose of this drug causes untoward side effects and does not result in sedation. Thus caution requires that the drug be tested in a systematic manner before being used in alpacas. Unfortunately it is not cost effective for drug companies to test drugs in alpacas. This cost is placed on the shoulders of breeders through their support of alpaca research.

A recent study, conducted by Dr. Hubbell and his colleagues at Ohio State University, examined the safety and efficacy of midazolam in alpacas. The results showed that midazolam was well absorbed after intramuscular administration, had a short duration of action and induced moderate levels of sedation in alpacas without untoward side effects. Thus midazolam may prove to be a very useful drug for veterinarians performing surgery on alpacas. This study was published in the *American Journal of Veterinary Research*, 2013, Feb, 74 (2) 294-299.

Previous studies funded by ARF have established the safety and efficacy of several other drugs for use in alpacas including the anti-inflammatory flunixin, the antibiotics florfenicol and enrofloxacin, and the analgesic tramadol, to name a few.

MEET THE ARF DEVELOPMENT COMMITTEE

Tsulan Balka

Elizabeth, Colorado, tsulan@lavenderfieldsalpacas.com

Tsulan and her husband Tom established Lavender Fields Alpacas in 2002. Tsulan's background as a women's health nurse practitioner carries over to assessing the health of their herd. She's passionate about alpacas and enjoys their individuality. She also volunteers with Alpaca Breeders of the Rockies.

Lona Nelsen Frank

Beaverton, Oregon, lfrank@alpacatv.com

Lona, whose background was in a diverse corporate world, and her engineering husband John have owned and operated ALPACAS of Tualatin Valley, LLC since 1988. Lona's interest in raising alpacas since the beginning has been focused toward nutrition and medicine.

Donna Higgason

St. Stephen's Church, Virginia, donna@clearviewalpacafarm.com

Donna and her husband Guerry established Clearview Alpaca Farm in 2005. They have a herd of over 90 huacaya alpacas. Donna has served on the board of Virginia Alpaca Owners and Breeders Association for several years and has owned her own real estate appraisal company for 20 years. She is very passionate about the health and nutrition of her animals, and is very active in the showing aspect of the industry.

Ruthanne McCaslin

Chardon, Ohio, blackalpaca@hotmail.com

Ruthanne and her family own Promised Land Farm where she has been raising alpacas for six years. She is also a small animal veterinarian, as is her husband, and has three teens to keep her busy.

Teri Quamme

Dundas, Minnesota, taquam@msn.com

Teri and her husband Kraig established Red Gate Alpaca Farm (MN) in 2009, and currently have 20 suris. Teri's background in the dental field carries over into the health and well being of their herd. Teri's love for animals and Kraig's farming background is a good combination for managing their herd. Teri and Kraig are also active in the showing aspect of the industry.

14TH ANNUAL SUPER STUD RAFFLE

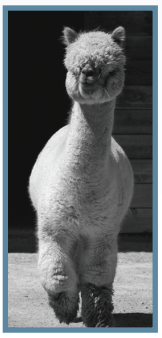
Each year since 2001, ARF has been fortunate to be able to offer breedings to some of the finest studs in the country, some of whom are no longer available for outside breeding. A complete list of these studs and their owners, who donated their services, can be found on the ARF website. Just click on "Super Stud Donors" under Donors.

Tickets are now available for the 2014 drawing for $50 and can be purchased online at www.alpacaresearchfoundation.org. Tickets can also be purchased through an ARF board or development committee member at regional and national alpaca shows. The drawing will take place on April 15, 2014.

We would like to thank the following herdsire owners for donating their herdsire's services to the 2014 ARF Super Stud Raffle.

SURI STUD: DIAMONTE OF PVA

Donated by
Erin Williams-Kerns and Glenn Kerns
AJ's Alpaca Ranch
Navarre, Ohio



HUACAYA STUD: SNOWMASS ROYAL CHALLANGER

Donated by
Pamela Brewster
Stillmeadow Farm
Stonington, Connecticut

DONATE YOUR VEHICLE TO ARF

Fast and free nationwide vehicle pickup by fully licensed, bonded, and insured towing professionals.

We accept all kinds of cars and vehicles regardless of condition including Cars, Trucks, RV's, Motor Cycles, ATV's, Snowmobiles, Boats, Vans, Trailers, Jet Skis, and more.

Car and vehicle donating is a great way to recycle and beneficial for the environment, while helping ARF achieve its goals

RESEARCH YOU CAN TAKE TO THE BARN

ARF FUNDED STUDY IDENTIFIES THE OVULATION INDUCING FACTOR IN SEMEN AS NERVE GROWTH FACTOR

For a male animal to pass on his genes, he must create sperm. However, the fluid which carries sperm—semen—contains much more than just sperm cells. The surrounding seminal fluid is a complex mix of sugars, lipids, proteins, and vitamins. Males require several accessory sex glands to create this soup of chemicals. The sheer complexity of semen and the presence of these sex glands had puzzled researchers for years. Some males use the chemical mix in seminal fluid to create a mating plug—a gooey clump that blocks the female's reproductive tract to prevent other males' sperm from gaining entry. However, male animals that do not use mating plugs still have functioning accessory glands, so they must serve a different function. In 1985, a group of Chinese researchers found that when camel seminal fluid was injected into female camels, they ovulated, even when no sexual activity had occurred. The researchers claimed that there was a chemical present in the fluid that stimulated ovulation. For 20 years their claim was ignored. In 2005, Gregg Adams, a veterinarian at the University of Saskatchewan in Saskatoon, Canada, with funds obtained from ARF, successfully repeated the Chinese experiment in llamas. He and his colleagues at the Universidad Austral de Chile in Valdivia, Chile, then spent the next seven years trying to find the mystery chemical in semen that triggered egg release. The protein they tracked down as the one responsible for ovulation turned out to be both surprising and familiar. The stimulatory chemical is a protein called nerve growth factor, or NGF, which had been known to function in the brain to keep neurons alive. NGF from semen appears to send signals to the female llama brain that result in ovulation. Though animal semen (including human semen) was known to be rich in NGF, no one had ever connected the protein to semen's stimulatory effect. (Currently it is unknown if the protein affects ovulation in humans.) "The idea that a substance in mammalian semen has a direct effect on the female brain is a new one," said Adams in a press release. "This latest finding broadens our understanding of the mechanisms that regulate ovulation and raises some intriguing questions about fertility. Excerpt of an article by Patricia Wald that appeared in *Today's Science* entitled "Stimulating Signals: Llama Mating Secrets."

ARF DONATION REQUEST

Dear ARI Member,

Did you know that Alpaca Research Foundation (ARF) is the only alpaca organization solely dedicated to funding research?

The tough economy has dramatically affected ARF whose funding is based almost entirely on tax deductible donations from the alpaca community. ARF is in need of your assistance in order to continue supporting the important research that has dramatically improved the health and genetics of alpacas around the world since 1996.

Whether you raise alpacas for breeding, showing, fleece, or companions, Alpaca Research Foundation benefits you by helping to ensure the long term health of your alpacas.

In our ongoing commitment to alpaca health and research, we are asking you to please consider making a tax deductible contribution to Alpaca Research Foundation. 100% of your donation goes directly to research.

To donate by mail, please complete the form on the reverse side and mail to ARF in the envelope provided.

To donate online, please visit www.AlpacaResearch.org/donate.

PLEASE SUPPORT THE ANNUAL ARF RESEARCH FUND DRIVE

ENCLOSED IS MY GIFT FOR: ☐ $5000 ☐ $1000 ☐ $500 ☐ $100 ☐ $50 Other_____

Please make checks payable to **Alpaca Research Foundation**. If you prefer, donations can be made with a credit card through our secure, on-line website www.alpacaresearchfoundation.org.

☐ I would like to be a volunteer for ARF. ☐ I prefer for my donation to remain anonymous.

☐ I want to be an ARF Sustainer and will donate $_____ per month in 2014.

If your employer supports a matching gift program, please send your employer's name, address, phone number, and matching gift information:

your name/phone number

your address/city/state/zip code

employer name/phone number

employer address/city/state/zip code

matching gift information

100% of all donations go to support research projects. ARF is a 501(c)(3) nonprofit organization. Donations are tax deductible.