



*Conserving rare breeds since 1977*

## Turkeys by the Bay

By Jeannette Beranger

Narragansett Bay is a large coastal area in Rhode Island with constant offshore breezes that once made it the host of the famous America's Cup sailing tournaments. The bay was named for the local Native American tribe whose name translates to "people of the small point." It's a relatively protected bay surrounded by land and filled with islands that create a milder climate with cooler summers and warmer winters than in the rest of the state. During the early Colonial period this region was home to some of the earliest large agricultural plantations of the colonies which produced some of the most iconic American poultry and livestock breeds. These included the Narragansett Pacer horse (now extinct), the Narragansett turkey, the Bronze turkey, the Rhode Island White chicken, and later perhaps the most famous chicken breed of all – the Rhode Island Red. Although the Narragansett turkey never became as famous as its chicken counterpart, it nonetheless made an impact on the turkey industry before the domination of the modern broad-breasted varieties that came into existence in the 20th century.

The turkey is one of the few species domesticated by early Native American tribes in the Southwest and into Latin America. The first European explorers brought these birds back to Europe where avid poultrymen bred and improved the birds into new varieties. Some of those birds then returned to America to become the breeds and varieties we know today. It is speculated that the Narragansett turkey descends from a cross between an English breed known as the Norfolk Black that came to the colonies in the 1600s and the native



**The Narragansett turkey is named for Narragansett Bay in Rhode Island, where the variety was developed. Photo by Jeannette Beranger.**

Eastern Wild turkeys present throughout New England, producing a stunningly colored bird known as the Narragansett. The breed enjoyed local popularity for many years until another variety was developed between 1830-1840 from the original Narragansett turkey stock. These birds were known as the Point Judith Bronze turkey (later known simply as Standard Bronze). The Bronze turkeys were further selected for size and productivity. By 1860 they had become larger than other common domestic or wild turkeys in this country. In the meantime the Narragansett breed began to decline until few remained. The Narragansett we know today arose from sports from the Point Judith/Standard Bronze turkeys that displayed their ancestral Narragansett coloration. They were considerably larger than the original bird of the same name. The newer Narragansett breed for a time enjoyed popularity in

southern New England and in parts of the Midwest. According to an 1872 account by W.W. Clift in *Poultry World Magazine*, the birds were "raised in greatest perfection in Connecticut and Rhode Island.... It was not uncommon to find flocks of one to two hundred birds, the product of a breeder flock of a dozen hens." Clift wrote of the breed the following year, "On one farm an old tom dressed 36 ½ pounds and on another four yearling toms averaged 31 pounds a piece." Despite the improved size, the Bronze did prevail in popularity and came to be admitted to the American Poultry Association's *American* (then called Lockwood) *Standard of Perfection* in 1871. The Narragansett followed by being recognized in 1874. The latest census of the Narragansett found approximately 2,200 total breeding birds in the United States, placing the breed in The Livestock

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# Participate in the Conservancy's Annual Members Meeting

December 11, 2018 7:00 pm Eastern Standard Time

This year, The Livestock Conservancy's Annual Meeting will again be held electronically, and you will again be able to participate by telephone and/or internet. Slides will be shared online and you can listen in by phone or through your computer or mobile device's speakers. If you wish to participate in the Q&A part of the meeting and you are only using a desktop computer, you will need to have a working microphone enabled. You may choose to view slides online and use your phone for audio if you wish. Note: Phone carriers may apply standard charges for call time and/or data usage.

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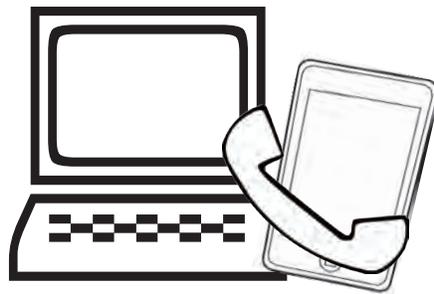
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If you would like to run or renew ads, all reservations completed before January 1 will be locked in at the old rates. Email Ryan at [rwalker@LivestockConservancy.org](mailto:rwalker@LivestockConservancy.org) or call 919-542-5704 to reserve space. Payment can be made by credit card by phone, check or credit card by mail, or through the Conservancy's online store at [www.LivestockConservancy.org](http://www.LivestockConservancy.org).

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is a membership organization that engages in research, education, and communication to promote these purposes.

Basic annual membership is \$45 and includes the quarterly *Livestock Conservancy News* and the annual *Breeders Directory*. We also accept unsolicited donations. All contributions are tax-deductible to the extent provided by law. Please send changes of address to the Conservancy.

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## Applying Assisted Reproductive Technologies for Conservation of Valuable Equine Genetics

By Charlene R. Couch, Ph.D. and Katrin Hinrichs, D.V.M., Ph.D.

Horse populations have declined in North America in recent years; for example, registrations of new foals by the American Quarter Horse Association, the world's largest equine breed registry, declined by 25% from 2010 to 2017 ([www.aqha.com/annualreport](http://www.aqha.com/annualreport)). No sector of the industry is likely harder hit by this trend than breeders of rare or endangered equines. In fact, registrations of endangered-breed foals have fallen 50% since 2008 (A. Martin, unpublished data). Endangered equine breeds in the United States, as defined by The Livestock Conservancy's *Conservation Priority List*, include those with annual registrations of <2,500 individuals and global populations of <10,000. Some of these rare breeds are quite well-known, such as the Lipizzan and the Clydesdale, and some are very rare, like the Poitou donkey and the Caspian horse. Endangered breeds represent unique and valuable equine genetic resources that, once lost, would be difficult or impossible to re-create. Many mainstream breeds like the Quarter Horse and Thoroughbred owe their origins, at least in part, to rare breeds like the Colonial Spanish Horse and the Akhal Teke. Preserving these genetic resources is important not only because of the richness these breeds bring to the equine world, but also to safeguard the future of all breeds.

Conservation of all rare breeds depends on successful reproduction from a limited population, and any one individual may become crucial to the breed's future. Recent advances in assisted reproductive technologies offer new hope for conservation of individual horses, rare horse breeds, and endangered livestock species.

The assisted reproductive technologies described here represent valuable tools for equine (and other livestock) conservation. For example, eggs, sperm and somatic cells (such as skin cells) can now be recov-

ered both from living and dead animals. Use of cryopreservation, where very low temperatures are used to carefully freeze and store the cells with minimal cellular damage, can extend the reproductive life of mares, stallions, and geldings far into the future, and tissue banks can help ensure the long-term survival of breed populations.

### Semen collection for cryopreservation

**Collecting an ejaculate** – A primary starting point for breed conservation and management is collection of semen for long-term storage. Semen is routinely collected from live breeding stallions using a variety of methods. Semen can be collected from a stallion as he mounts a mare, or a phantom (“dummy”) mare, and ejaculates into an artificial vagina. When a suitable mount is unavailable, e.g. for ponies, or when the stallion cannot physically mount, semen can often be collected by placing an artificial vagina on the penis while the stallion is standing, or even a collection bag on the penis then stimulating ejaculation using pressure with warm cloths. If these methods fail, some stallions can be induced to ejaculate by administration of sedative-like compounds, under the supervision of a trained veterinarian. Typically, with board and multiple collections to provide a reasonable supply of frozen semen for future use, the total cost per stallion is \$2,500-\$3,500.

**Epididymal sperm collection** – In the event of injury or death, or following

the gelding of a stallion, mature testes and their associated tissues (epididymides) can be harvested and shipped immediately to a freezing facility where sperm can be recovered and frozen. It is possible to retrieve 30-50 breeding doses of frozen sperm from epididymal tissue of a normally-fertile stallion. Cost of harvesting the epididymal sperm is \$500-\$750, and cryopreservation of the recovered sperm can cost about \$750-\$1,000.

**Freezing the semen** – In the laboratory, the collected semen is processed and placed into a cryoprotective extender and frozen at about 100 million sperm per straw. A breeding dose is typically 200-300 million progressively motile sperm. The average stallion produces 4-8 doses per collection. The number of straws needed for artificial insemination depends on the quality of the sperm after thawing; typically about one billion sperm total is used for standard insemination. Very young stallions and older stallions may have fewer sperm or lower-quality sperm, but 80-90% of adult stallions produce freezable semen. If very few sperm are available (older stallions, post-mortem collections, etc.), then all or part of the ejaculate can be frozen as doses of ~1 million sperm per straw or even less. These sperm can be used for intracytoplasmic sperm injection (ICSI, see below) which can multiply the potential to produce offspring from a given store of semen by up to 1000 times.

Once the sperm are frozen and preserved in liquid nitrogen, they can be stored indefinitely, with an estimated half-

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Ampoules of frozen bovine semen in a liquid nitrogen canister. Photo by Uwemuell from <https://commons.wikimedia.org/w/index.php?curid=5306636>

# Applying Assisted Reproductive Technologies

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life of ~50,000 years. While the pregnancy rate per mare inseminated with frozen semen is typically 25-50% lower than that for fresh semen, use of cryopreserved sperm is often more feasible than is shipping a stallion or a mare, and makes possible the international shipment of semen. International shipping invokes specific requirements for testing stallions for disease, and for semen collection and storage; consult with a veterinarian if there is even a possibility for sharing samples overseas. One series of semen collections yields multiple doses that can be used over many years, far extending the natural breeding life of the stallion. Frozen semen can be preserved long-term in a semen bank for an unforeseen future. The frozen semen must be stored in a dedicated storage facility to avoid the possibility of liquid nitrogen failure and thus loss of the samples. Dividing the sample among locations can further safeguard the collection. One estimate of the cost to house such samples is \$50/quarter for 250 straws.

## **Embryo recovery, transfer or cryopreservation**

**Embryo flushing** – Some mares can conceive but cannot carry a pregnancy to full term. For these mares, recovering the embryo from the uterus soon after conception, followed by transfer of the embryo to the uterus of a recipient mare, can allow production of healthy foals. Embryo recovery and transfer can also be used to produce multiple offspring per year from a given mare. For embryo recovery, the mare is inseminated as she would be to establish a normal pregnancy, but seven days after ovulation, the mare's uterus is flushed to recover the embryo. The embryo can be transferred immediately to a recipient mare, or can be efficiently cryopreserved for transfer in the future. For fertile mares, embryo recovery and transfer can allow production of multiple embryos in a given year. The cost to recover an embryo is typically \$500-\$1,000, and the cost to transfer an embryo to a recipient mare and purchase the pregnant recipient is typically



**The first cloned horse foal in North America, named Paris Texas, produced by Texas A&M, 2005. Photo credit: Larry Wadsworth, College of Veterinary Medicine & Biomedical Sciences, Texas A&M University.**

\$2,000-\$5,000.

## **Oocyte harvesting from live mares** –

For cases in which a mare cannot conceive or carry an embryo for the seven days needed for embryo recovery, oocytes (unfertilized eggs) can be collected from the mare's ovaries and used for fertilization. The oocytes are recovered by transvaginal ultrasound-guided follicle aspiration (TVA). This can be done repeatedly, as often as once every 14 days; however, the TVA procedure does carry some risk of infection or injury to the reproductive system. The oocytes are shipped to a laboratory that has an established procedure for intracytoplasmic sperm injection (ICSI, see below) and resulting embryos can be transferred to recipient mares or frozen for later embryo transfer. Cost is ~\$1,000 for the oocyte harvest.

**Post-mortem oocyte recovery** – Death of a mare does not mean that her reproductive potential must be lost. Instead, ovaries can be harvested from the mare immediately after she has died, and shipped at room temperature to a laboratory. This must be done quickly; best results are obtained if the laboratory receives the ovaries within six hours of death. Unfortunately, unfertilized equine oocytes currently do not have good viability after freezing, although research is being done to develop methods for this. Therefore, at the time of ovary recovery, steps should be taken to make suitable semen available to the labo-

ratory. Oocytes recovered from the fresh ovary can be transferred surgically into the oviduct (Fallopian tube) of an inseminated recipient mare for immediate fertilization, or the oocytes may be fertilized in the laboratory by ICSI (see below) and the resulting embryos frozen or transferred. Cost is variable for ovary removal (your veterinarian) and about \$500 for dissection of the ovary to recover oocytes. Costs for the surgical transfer to an inseminated mare are approximately \$1,500 per surgery; costs of the laboratory fertilization procedure (ICSI) are given below.

**ICSI (intracytoplasmic sperm injection)** – Oocytes harvested from live mares or harvested post mortem can be fertilized by the injection of a single sperm into the cytoplasm of the oocyte (see photos). This technique is especially useful when numbers of oocytes or sperm are limited. The resulting embryo can be cryopreserved for later use or placed directly into a recipient mare to produce a pregnancy. The cost is about \$500-\$1,000 for the oocyte maturation and ICSI procedures, and most laboratories charge an additional \$500 to \$1,000 for each embryo produced as a result.

## **Somatic cell preservation and cloning**

**Cloning** – Cloning can be used to produce a live foal having the same genetics as the donor animal. The only material needed from the donor animal is a small, pea-sized skin biopsy. Cells are cultured

from the biopsy and frozen. Cloning involves transferring the nucleus of one of these cells into a host oocyte whose own nuclear material has been removed. The oocyte is stimulated to divide and develop into an embryo, which can then be cryopreserved or transferred to a recipient mare. The cloned foal born is a genetic twin of the donor animal, and can be used for breeding to produce essentially the same foals that the donor animal would have produced. This is especially valuable if the original animal died or was gelded before his or her genetic value was known. Although the cost of cloning a horse is high (currently about \$70,000 commercially), prices have continued to decrease. In any event, obtaining the tissue and culture and freezing of somatic cells from important animals is both highly feasible and affordable. The decision to clone the animal can be made in the future. Cost for tissue collection is variable (your veterinarian); processing of the sample for cell culture and storage is about \$1,000-\$2,000.

#### Tissue banks

For conservation at the breed level, an optimal collection of reproductive tissues will be broadly representative of the genetics available in the breed, including both major and minor bloodlines. At the very least, stored germplasm (sperm and oocytes), somatic cells and embryos should reflect the genetic ratios in place at the time the tissue bank is created. More optimally, to conserve rare genetics, the sample will contain equal representation of all genotypes present in the breed, whether currently desirable or undesirable, and more mares than stallions. Any

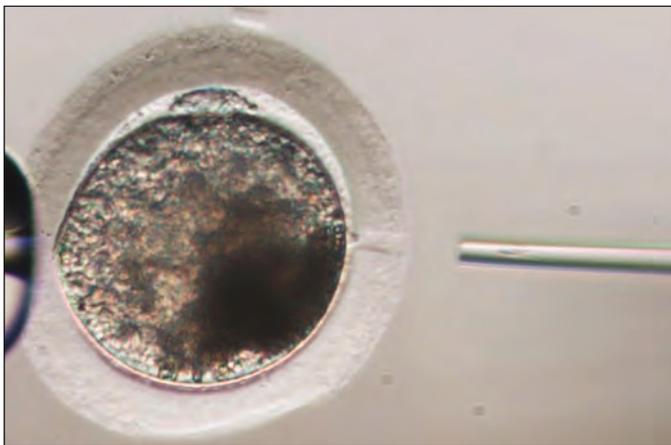
sample collection protocol should include information on the origin of the sample, such as pedigree information of the donor, and phenotypic characteristics – hopefully with photographs! Characteristics such as health, reproductive ease, longevity, or hardiness should be documented, too.

For breeds with populations in more than one country, it is worthwhile to investigate health testing requirements in all of the possible countries with which germplasm or tissue samples might be exchanged. Procedures for quarantine and testing ([www.aphis.usda.gov/aphis/ourfocus/importexport/animal-import-and-export/equine/country-of-origin](http://www.aphis.usda.gov/aphis/ourfocus/importexport/animal-import-and-export/equine/country-of-origin)) and use of approved facilities may add to the cost of the collection but will preserve options for the future transfer of critical genetics between countries. The ability to transfer genetics between countries may make the difference for conservation of breeds such as Hackney horses, which are critically endangered in the United States, Canada, United Kingdom, and Argentina.

#### Conclusion

Assisted reproductive technologies for conserving valuable equine genetics have come a long way in the last two decades. Live foals have been produced by all these methods. The foal Paris Texas (barn name “Daniel”) was the first cloned horse foal in North America and was produced by Texas A&M University in 2005 (see photo). Researchers continue to make improvements in these techniques, and costs continue to fall. Harnessing these techniques for conservation allows breed associations to proactively save tissues from a diverse cross-section of a population. These exciting techniques offer new possibilities for the conservation of both rare and common breeds of equines and bring new hope to conservation of some of our rarest equines. ❖

*Charlene Couch is a Program Coordinator for The Livestock Conservancy and Katrin Hinrichs, D.V.M., Ph.D., is with the College of Veterinary Medicine and Biomedical Sciences, Texas A&M University.*



**Photo of the ICSI procedure; the sperm is in the pipette ready to be injected into the oocyte. Photo credit: Dr. Joao Brom-de-Luna, College of Veterinary Medicine & Biomedical Sciences, Texas A&M University.**

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There are 4 options to choose from. Pick the ad size that works best for your farm, business, or organization.

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## 2. Reserve Your Spot by December 31, 2018.

Don’t miss out on this great opportunity! Email [rwalker@LivestockConservancy.org](mailto:rwalker@LivestockConservancy.org) with your preferred ad size to reserve your spot today.

## 3. Submit Your Artwork.

Send high resolution (300dpi+ preferable) ads to Ryan to be included in the 2018 directory no later than December 31, 2018. Ads may be sent in color, but will be printed black and white.

**Questions?** Contact Ryan Walker at [rwalker@LivestockConservancy.org](mailto:rwalker@LivestockConservancy.org) or 919-542-5704, ext. 102.

## Online Resources for Equine Assisted Reproductive Technologies

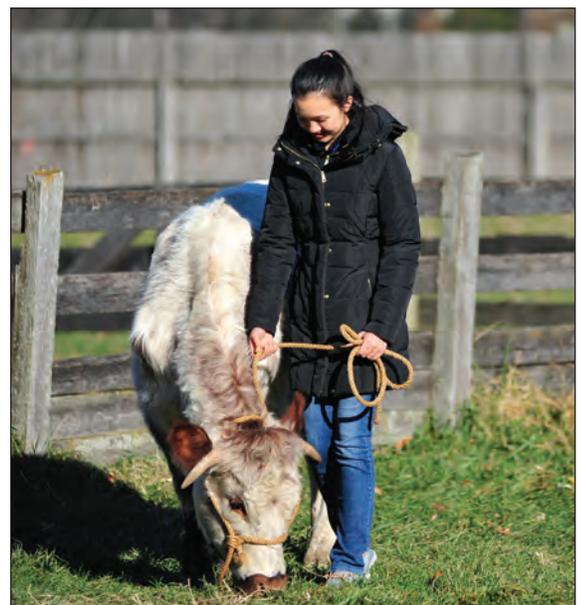
Colorado State University: College of Veterinary Medicine, <http://csu-cvmb.colostate.edu/Pages/default.aspx>

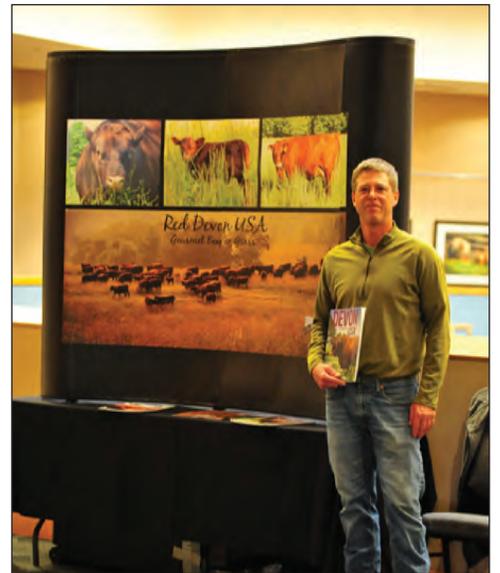
Equine Medical Services, <http://equimed.com/reproductive-services/>

Select Breeder Services, [www.selectbreeders.com/](http://www.selectbreeders.com/)

Texas A&M University: College of Veterinary Medicine & Biomedical Sciences. Equine embryo laboratory, <http://vetmed.tamu.edu/equine-embryo-laboratory>; ; Teriogenology laboratory, <http://vethospital.tamu.edu/large-animal-hospital/equine-theriogenology/stallion-services>.

# Scenes from the Conference





Heritage Livestock Conference photos by Paul Henningson, Ryan Walker, and Angeliqe Thompson.

# Carrying on with Kerry Cattle

*The Mid-Atlantic Chapter of the AKCS Sponsors the First National Kerry Show*

By Kristen McCann

Kerry Cattle are certainly being recognized for their many merits of late. Rockbridge County Fair, located in the Appalachian mountains of Lexington, VA, has been very involved in supporting and showcasing Heritage Breeds and activities thanks to the hard work of Steve Hart's family and Kendy Sawyer of HineSite Farm. This September, this picturesque and traditional fair, already so unique, was to hit a new high. Rockbridge was able to host the Mid-Atlantic Chapter of the American Kerry Cattle Society (AKCS) and its first sponsored National Kerry Show. This is a huge feat for such a rare Irish breed (approximately 1,000 Kerry Cattle world-wide!)

Kerry Cows are remarkable in so many ways. They seem to be perfectly suited for a sustainably-minded homestead farm. With milk that is high in butterfat and easy-to-digest (smaller fat globules), this cow is an easy keeper, having traditionally lived in the highlands, while providing



**"Faerie Cows" dressed up to illustrate the historic Irish legend. Photo courtesy of Kristen McCann.**

milk on forage where other breeds of cattle could not survive. They are hardy and productive, long-lived, and well-known for their friendliness and trainability. In fact, their tractability is exactly what has led to the new tradition of hosting the AKCS North American Championship Show event at Rockbridge County Fair.

Many of the participants of this show were drawn to this event because of the precisely customized oxen clinics of-

fered by Kendy Sawyer of HineSite Farm. Kendy herself drives an experienced pair of Kerry oxen (Cole and Cannon) that have the knack of gathering a diverse following. Collectively, these boys have participated in numerous events where children often lead and even get to ride on a special Kerry ox of choice. Often, the clinic at Rockbridge will bring in guest teachers to give a different perspective or offer specialized classes. This year, the guest teachers Roy Hewes, Bert Nickerson, and Meg Hewes Walker had a whole class of oxen comprised mostly of Kerry Cattle. After working with these black beauties, Meg offered, "My experience with Kerry cows is actually very limited. However my first impression is wonderful! Trustworthy, even tempered, and willing come to mind!" Although Kerry bovine are smaller cattle, they know how to pick up their feet and are typically very friendly and easily taught. This year, nine year old John David was driving the team beautifully, having never worked oxen before. Even the local news team picked up on the magic of this event and put Kerries on the screen. For viewing, go to <http://bit.ly/KerryOxTeam>.

However, the very Kerry fun did not stop here! Experienced livestock judge, Cody Manspile, offered to judge this rare breed as a matter of public interest and

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**A team of Kerry oxen are used during a clinic at the Rockbridge County Fair. Photo courtesy of Kristen McCann.**

# African Swine Fever – Information for Pig Farmers

By Mark J. Estienne, Ph.D.

As of this writing, African swine fever has been reported in 18 Chinese provinces, including the large pig-farming provinces in the southern portion of the country. The highly contagious disease is not harmful to humans, but is fatal to swine. Reports first surfaced in August and since then, over 200,000 pigs have been culled. Although the disease has not been reported in the United States (and has never occurred here), swine farmers are encouraged to monitor news about the outbreak and practice good biosecurity measures to reduce the chance of disease entering or spreading on their farms. As Livestock Conservancy breeders know, biosecurity measures are one of the tools we use to protect rare breeds and bloodlines from potential threats.

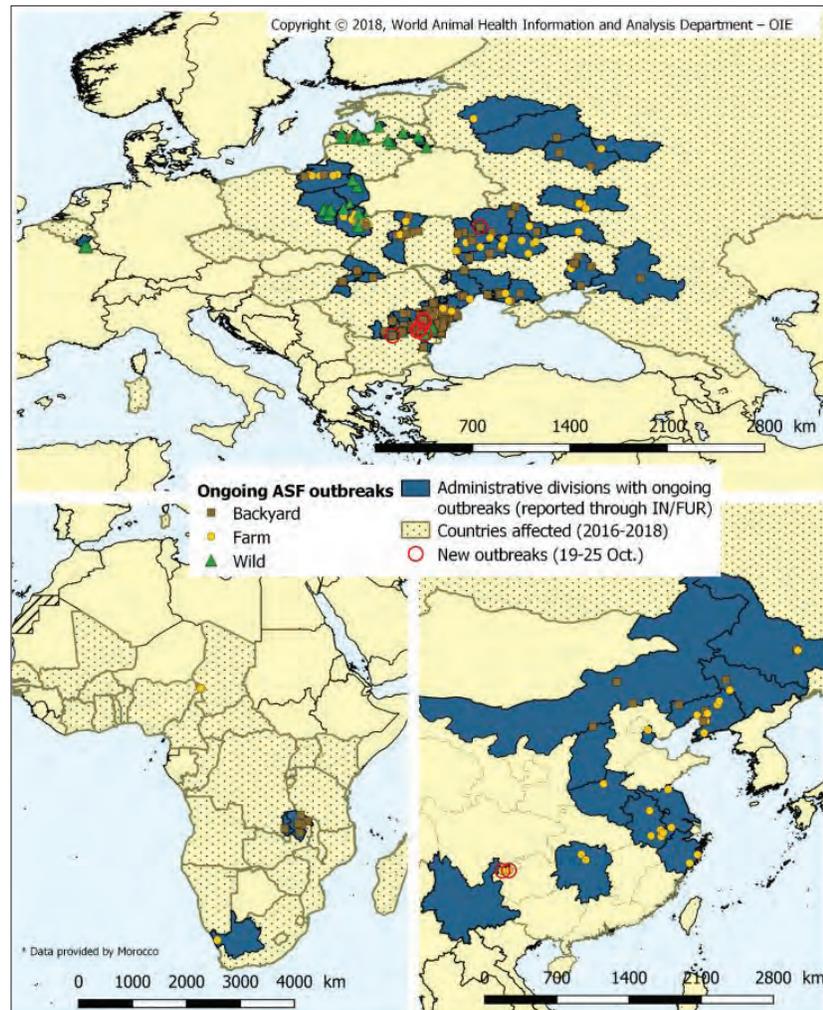
The following piece is excerpted and edited from a longer article by the author.

Additionally, USDA's Animal and Plant Health Inspection Service has compiled a *Factsheet on Biosecurity for pigs with outdoor access* at [http://bit.ly/APHIS\\_ASF](http://bit.ly/APHIS_ASF).

## What Causes African Swine Fever?

A large, double-stranded DNA virus causes African swine fever. Scientists have identified 22 strains of the African swine fever virus that differ in virulence (in other words, its severity or harmfulness). The virus does not affect humans.

In Africa, the African swine fever virus purportedly cycles between warthogs (the wild animal) and soft ticks (the vector). Young warthogs, bitten by infected ticks while still in the burrow, develop viremia (virus in the blood) and subsequently infect other ticks feeding. Warthogs are resistant to and not affected by the African swine fever virus. Infected ticks fall off warthogs and then attach to a new host, such as domestic pigs. Once infected, a domestic pig transmits disease to other domestic pigs by direct contact. In Europe, feral swine and wild animals such as the European wild boar are also very suscep-



tible to African swine fever.

The African swine fever virus is very hardy and can persist for months in uncooked pork products, animal feedstuffs, and “swill” (food scraps fed to pigs). Thus, indirect transmission is important in the spread of the disease.

## What are the Clinical Signs of African Swine Fever?

Wild African pigs such as the warthog are very resistant to the virus that causes African swine fever. In domestic pigs, however, the virus causes a loss of appetite, elevated body temperatures of 104° to 108°F (normal body temperature for a pig is 102.5°F), leukopenia (decrease in the number of white blood cells in the blood), and hemorrhages in the skin of the ears and flanks. Other clinical signs are bleeding from the nose and anus, constipation or sometimes diarrhea, and vomiting. Pregnant females often abort their litters. Morbidity rates (the incidence of a disease across a population) range from 40 to 85%. In young pigs, death loss is usually 100%. In adult animals, highly virulent strains are

associated with mortality rates of 90% to 100% and low virulent strains cause death losses of 10% to 30%. Once a pig has contracted African swine fever, prospects for survival depend on the infective strain, but death losses of 100% are common. Thus, there are no effective treatments for stricken animals.

Currently there are no commercially available vaccines to protect against African swine fever. As mentioned previously, the African swine fever virus is genetically diverse with many strains. Thus, one concern with vaccine development is that a product effective against one strain may offer little protection against another.

The disease spreads by legal or illegal movement of infected animals or pork products, or by transportation of infected feedstuffs. As with any foreign animal disease, the best approach is to prevent the pathogen from entering the country. Biosecurity is essential. Although research has suggested a low annual probability of African swine fever introduction to the

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# Livestock Conservancy Ambassadors

The Conservancy's members know how important heritage breed conservation is, but many people outside our normal circle of influence do not. To help carry our message to more people, the Conservancy has enlisted a group of Ambassadors to serve as spokespersons for Heritage breeds. These Ambassadors are well-known in their fields for outstanding accomplishments and are public figures, well-suited to carry The Livestock Conservancy's message to the world.

A few ways you may see them engage with our organization are: quotes, videos, or photos for the Conservancy's website, social media, or for the press; appearances at Conservancy events; representation within their circles of influence at non-Conservancy events.

If you happen to see one of our Ambassadors, please thank them for serving in this role!



**Wendell Berry**

Wendell has been a member of the Conservancy since 1986 and raises sheep and horses. He is an American novelist, poet, environmental activist, cultural critic, and farmer, based in Kentucky. According to him, the good life includes: sustainable agriculture, appropriate technologies, healthy rural communities, connection to place, the pleasures of good food, husbandry, good work, local economics, the miracle of life, fidelity, frugality, reverence, and the interconnectedness of life.



**Arianne Daguin**

Arianne is the founder of D'Artagnan, a "leading purveyor of organic poultry, game, foie gras, pâtés, sausages, smoked delicacies, and wild mushrooms to the nation." She is on the board of City Harvest, active in The American Institute of Wine & Food and Women Chefs and Restaurateurs, and founding president of Les Nouvelles Mères Cuisinières, an international association of prestigious women chefs. She delivered the keynote address at the Conservancy's 2013 conference in North Carolina.

## African Swine Fever

*Continued from previous page*

U.S., the pork industry must remain vigilant. The risk of exposure of domestic pigs to imported live pigs infected with African swine fever is very low (roughly one outbreak of African swine fever in 276 years). If such an event did occur, however, it is most likely that entry would be through Iowa, Minnesota or Wisconsin, with pigs originating in Canada.

The risk of African swine fever introduced by contaminated pork products was greater than the risk associated with live animals. The risk of entry was greatest in the coastal states of New Jersey, Virginia, and California, where large seaports exist, with pork products released from Denmark and Poland. The risk of feral pigs accessing contaminated swine products in landfills was greater than the potential exposure of domestic pigs through swill. The National Pork Board, National Pork Producers Council, the American Asso-

ciation of Swine Veterinarians, the Swine Health Information Center and the USDA have focused collaborative efforts on the safe importation of feed ingredients. This is logical given Porcine Epidemic Diarrhea virus, which emerged in the United States for the first time in 2013, killing millions of pigs, probably entered the country through contaminated feedstuffs.

### **Effects of African Swine Fever on Food Security and Economics**

African swine fever has food security implications, especially in countries where pork is a major source of dietary protein for humans. For example, in the African countries of Cote d'Ivoire and Madagascar, African swine fever introduced in the late 1990s, resulted in a decrease in the entire pig population of 30% to 50%.

Newly introduced or endemic African swine fever severely affects the economies of countries with large commercial swine industries. However, the greatest losses typically occur on small-scale pig farms lacking effective biosecurity and control strategies. An African swine fever infection results in a loss of export markets and extremely costly procedures for eradication

of the disease. Introduction of the disease to Cuba in 1980 resulted in control and eradication costs that exceeded \$9.4 million (USD). During the 1990s, Spain spent over \$92 million for the last five years of the African swine fever eradication program. It has been estimated that the net benefit of preventing introduction of African swine fever into the U.S. is nearly \$4.5 billion.

China produces more hogs and consumes more pork than any other country in the world. Indeed, nearly 50% of the world's pig population is in China. The current outbreak of African swine fever will likely have devastating effects on the Chinese economy. The disease is causing extreme pork shortages. Supplies were already tight, a result of the 25% tariff that the Chinese placed on pork imported from the United States. Consumer pork prices in China have risen over 7% over the past several months. ❖

*Mark J. Estienne, Ph.D. is Professor and Swine Research Physiologist, Virginia Tech-Tidewater Agricultural Research and Extension Center, Suffolk, Virginia.*



**Isabella Rosselini**

Isabella is best known as an actress and model, but she also lives on a farm on Long Island and raises goats, sheep, pigs, and Heritage chickens, grows organic vegetables, and produces honey and eggs. She recently published a children's book *My Chickens and I*, describing her chickens to young readers and completed a Master's degree in Animal Behavior and Conservation. Local school groups sometimes visit the farm, where Isabella teaches them about the animals.



**Antoine Westermann**

Antoine is an acclaimed French chef, who maintained a three-star Michelin rating at his Le Buerehiesel restaurant for over 31 years, before asking for them to be removed. He currently owns and operates the restaurant "Le Coq Rico" in Paris and opened a second location in New York City in 2016, which focuses on highlighting the flavor diversity of oft-overlooked heritage breeds of poultry through simple dishes, expertly prepared.

## Kerry Cattle

*Continued from page 8*

education for both observers and Kerry breeders. Judge Cody spent his covetable time and knowledge carefully looking over each of the ten dairy cattle from five different farms. We all profited from his insights and enjoyed getting to learn more about improvements and genetic information carried through family lines and the diversity within.

Perhaps the sweetest spot at the show was the informal costume class. Traditionally, in Ireland, the families of old kept their valuable little black cows under lock and key in their homes overnight, as they did not want the "faeries" stealing all their precious milk. Thus, these cows became known as the "Faerie Cows." The children participating took this story to heart and dressed their calves as Kerry fairies. It was marvelous! And regardless of show or placing, you could see the relationship that each owner, whether child or adult, had with their Kerry and the community.

Topping the Mid-Atlantic chapter of the American Kerry Cattle Society's first National Show will be difficult but seems to be in the cards, so to speak. Next year, plans are being made for a larger and even more inspirational Kerry Cattle series of events. So, bring your yokes, wings, and Kerry cattle to Rockbridge Fair on September 5-7, 2019. We look forward to expanding the Kerry family circle! ❖

## Turkeys by the Bay

*Continued from page 1*

Conservancy's "Watch" category of their Conservation Priority List.

Gail Cooley has had a nearly decade long love affair with the Narragansett



**Gail Cooley poses with one of her Narragansett turkeys. Photo courtesy of Gail Cooley.**

turkey. She maintains a beautiful breeding flock at Patient Wait Farms in South Carolina. I asked Gail why this breed struck a chord with her, and she told me, "I simply enjoy seeing them every day because they are the prettiest part of my landscape. They are low maintenance compared to the other species on the farm and manage to help keep a number of pest insects under control as a bonus." She enjoys a robust market for them as a holiday bird making her biggest problem that of telling potential customers that she is sold out. Said Gail, "I believe Heritage turkeys are the first "toe in the water" for people wanting to buy grass fed and local meat. The cost is higher than a commercial bird but it is often justified because it's often a holiday gift for the family in the form of an amazing dish for the table. Once they realize what real turkey tastes like, it opens the door for all kinds of other surprises such as Heritage chicken, beef, pork, and more." ❖

*To learn more about the Narragansett turkey or to find producers in your area visit [www.livestockconservancy.org](http://www.livestockconservancy.org).*



**An exhibitor shows off her ribbons with one of her Kerries. Photo courtesy of Kristen McCann.**

# Food Forever Initiative

This past September, The Livestock Conservancy was one of 50 attendees invited to participate in a unique meeting lead by The Crop Trust. The organization, founded by former Conservancy board member Cary Fowler, is best known for the famous Svalbard Seed Vault in Norway. The meeting is part of an effort to bring attention to the importance of conserving *both* plant and animal biodiversity in agriculture. Known as the *Food Forever* initiative, the project has recruited partners from around the globe to speak as a unified voice for plants and animals. This meeting was the first time they were all brought together at one site.

The foundational ideas of the initiative come from the United Nation's Sustainable Development Goal 2.5 known as the "goal for zero hunger," which states the following: "*By 2020 maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed.*"

The first annual meeting of the Food Forever initiative began with discussions on promoting plant diversity lead by speakers from The Rodale Institute, Crops for the Future, Tender Greens, Seed Savers Exchange and others. Livestock-centered talks were conducted by Jimmy Smith of the International Livestock Research Institute (ILRI) and The Livestock Conservancy's Jeannette Beranger. ILRI shared their outstanding work on the African continent. One of the most exciting programs is their latest groundbreaking scientific studies on the role of animal production as a powerful carbon sink as opposed to being a perceived detriment to global climate change. The Conservancy was asked to touch upon the topic of promoting rare breeds which included points such as the importance of crafting a clear message, becoming a voice at the table with the government and commercial agriculture, engaging the "foodie" and "green" communities, and effective



**Cary Fowler speaks at the Food Forever Initiative meeting. Photo by Jeannette Beranger.**

utilization of social media to promote the work.

The second day of the meeting was a brainstorming session on how the groups could take advantage of a joint platform. The microphone was opened up for participants to give feedback and develop proposals for future activities. A wide variety of ideas emerged including a proposal from Botanic Gardens Conservation International that all botanical gardens should be encouraged to display chickens as part of their messaging on biodiversity and sustainability.

The meeting ended on a high note with all the attending organizations making pledges on steps they will take to move the initiative closer to meeting the UN's plan for zero hunger. A follow-up gathering is planned for 2019, and we look forward to hearing about the progress that our new partners are making on this important movement to secure global agrobiodiversity.❖

## You as Author

Would you like to see your favorite breed featured in *The Livestock Conservancy News*? We welcome submissions of articles, recent news, event information, new research, recipes, and other kinds of content about Heritage breeds, their uses, and their products for this newsletter. If you are not an experienced writer, don't worry – we have editors for that!

If you – or members of your breed association – have content or ideas for newsletter material, please email them to Ryan Walker at [rwalker@Livestock-Conservancy.org](mailto:rwalker@Livestock-Conservancy.org), or send it to: The Livestock Conservancy, PO Box 477, Pittsboro, NC 27312. If you want to run anything by us first, feel free to call 919-542-5704 or email.

### Attention, fiber artists, sheep breeders, and fiber providers:

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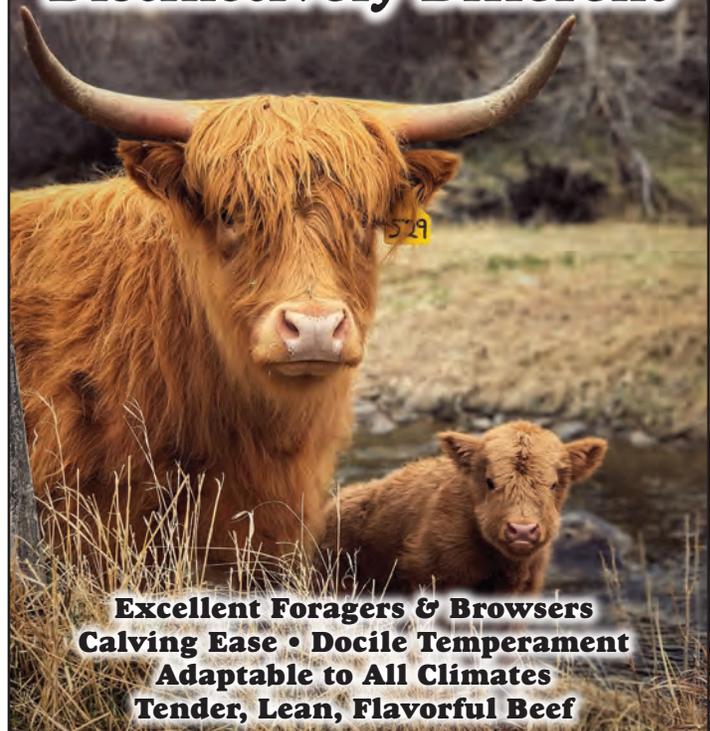
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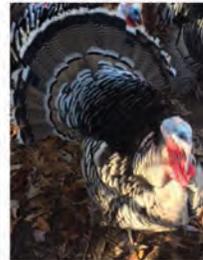
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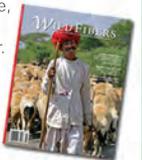


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*See the Conservancy website for a more extensive list of events. The Livestock Conservancy encourages event organizers to submit events related to conservation, farming, sustainability, rare breeds, and more to the Conservancy's Calendar. Send your submission to [rwalker@livestock-conservancy.org](mailto:rwalker@livestock-conservancy.org) or mail to PO Box 477, Pittsboro, NC 27312.*

### December

★ ★ **December 11 – Livestock Conservancy Annual Members Meeting**, 7pm Eastern. Log-in and call-in information can be found in the Member Area of [LivestockConservancy.org](http://LivestockConservancy.org).

★ ★ **December 31, 2018 – DEADLINE to update information and submit ads** for the Livestock Conservancy's 2019 Breeders and Products Directory. If needed, log in to update your information online here. Email [rwalker@livestock-conservancy.org](mailto:rwalker@livestock-conservancy.org) or call 919-542-5704 for more information about advertising in the directory.

### January

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**January 18 - February 9 – The 123rd Annual Fort Worth Stock Show & Rodeo** will be held in Fort Worth, TX. The event features world-class livestock shows, kid-friendly exhibits, carnival/midway fun, live music, unique daily shopping, and nightly rodeos. Over 1 million visitors and 22,000 head of livestock participate each year. Visit [www.fwssr.com](http://www.fwssr.com) for more information.

**January 18-19 – The 23rd Annual Vermont Grazing and Livestock Conference** will be held at Lake Morey Resort in Fairlee, VT. Visit [www.uvm.edu/~pasture/conference.html](http://www.uvm.edu/~pasture/conference.html) for more information.

**January 23-26 – The American Sheep Industry Association Convention** will be held in New Orleans, LA. Visit [www.sheepusa.org/Events\\_2019Convention](http://www.sheepusa.org/Events_2019Convention) for more information.

**January 23-26 – The EcoFarm Conference** "Resilience is Fertile" will be held in Pacific Grove, CA. Visit [www.eco-farm.org](http://www.eco-farm.org) for more information.

**January 23-26 – The Southern SAWG Conference** "Practical Tools and Solutions for Sustaining Family Farms" will be held in Little Rock, AR. Visit [www.ssawg.org](http://www.ssawg.org) for more information.

### February

**February 6-9 – The PASA Sustainable Agriculture Conference** will be held in Lancaster, PA. Visit [www.pasafarming.org/conference](http://www.pasafarming.org/conference) or call 814-349-9856 for more information.

**February 7 – The Organic Commodities and Livestock Conference** will be held in Raleigh, NC. For more information, visit [www.carolinafarmstewards.org/oclc/](http://www.carolinafarmstewards.org/oclc/) or call 919-542-2402.

**February 14-16 – The 40th Annual Ohio Ecological Food and Farm Association (OEFFA) Conference** "Just Farming: The Path Before Us" will be held in Dayton, OH. Sustainable food and farming workshops, a trade show, from-scratch meals, a kids' conference, childcare, and keynote speakers. Visit [www.oeffa.org/conference2019](http://www.oeffa.org/conference2019) for more information.

★ **February 16-17 – The Mother Earth News Fair** will be held in Belton, TX. This fun-filled, family-oriented sustainable lifestyle event features dozens of practical, hands-on demonstrations and workshops on everything from beekeeping to using solar electricity. Visit [www.motherearthnewsfair.com](http://www.motherearthnewsfair.com) for more information.

**March 8-10 – The Organic Growers School Spring Conference** will be held in Asheville, NC. 70+ sessions per day: practical, affordable, regionally-focused workshops on growing, permaculture, homesteading, and urban farming. Trade show, seed exchange, kid's program. Visit [www.Organicgrowersschool.org](http://www.Organicgrowersschool.org) for more information.