



*Conserving rare breeds since 1977*

## Highland Cattle Graduation and Other Conservation Updates

By C.R. Couch, D. P. Sponenberg,  
T. Coucher, A. Martin, and J. Beranger

*Critical ... Threatened... Watch...  
Recovering... Graduation!*

The Livestock Conservancy determines its conservation priorities based upon a breed's annual number of registrations in the United States and its estimated global population size. This Conservation Priority List helps the Conservancy to target conservation efforts for more than 150 endangered livestock breeds.

A breed is no longer in need of continuous monitoring if annual registrations exceed 5,000, or if global numbers are greater than 25,000. Having a breed hit these benchmarks is always an occasion for celebration, because it means that the dedication and hard work of breeders have paid huge dividends.

This year, **Highland cattle** became numerous enough to graduate from the Conservation Priority List! In numbers, this means that there are more than 1,000 annual registrations in the United States and more than 25,000 animals globally. These cattle, native to the Scottish Highlands, are especially popular in the northern tier of the United States and in Scandinavian countries. Their dramatic shaggy coats and long horns make them a true conversation starter for agritourism operations. This breed has become an international resource for beef production in marginal landscapes. Another important use is conservation grazing. Highland cattle have always had a great reputation for being rugged producers of high-quality beef and they have now found a secure niche as productive partners in effective range management throughout the globe.



**Highland cattle have made significant strides since being added to the Conservation Priority List in 1986. Photo by Jacquelyn Becker.**

The breed has benefited greatly from effective promotion and registration by the breed associations.

**Florida Cracker cattle** moved up in numbers from the Critical list to the Threatened category, thanks to careful management by the breed association and an appreciation of their long history by the state of Florida. Florida Cracker cattle are descended from Spanish cattle that were brought to the Americas in the 16th century. These hardy animals are small, long-lived and well-adapted to the hot, humid climate of the Deep South.

**Belted Galloway cattle** are relatively popular as an addition to mixed herds, but registrations of purebreds have fallen, and this breed moved down on the 2019 Conservation Priority List from Recovering to Watch. Only about 1,600 cattle were registered in the United States in 2017. Global population figures also support the move to the Watch category. "Belties" originated in southwestern Scotland and have distinctive wide white mid-sections, or "belts,"

that contrast with their furry black bodies. Their coat is well-suited for the animals' survival in cooler climates, and these hardy animals produce excellent beef.

**St. Croix sheep** moved up from the Threatened category to Watch. To make the move to the Watch category, the breed must have more 1,000 annual registrations in the United States and an estimated global population of more than 5,000. This breed of Caribbean sheep grows a hairy coat that they can shed each year, rather than a woolly one that needs to be shorn. They are also fairly small in stature. These traits make them quite heat tolerant, although they can thrive in many climates.

**Hereford hogs** are on the move, stepping up to the Recovering category from the Watch list. The Recovering category contains breeds that have exceeded the Watch list in numbers but remain in need of monitoring. The Recovering category requires a global population size of greater than 10,000 animals. Hereford hogs are

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# Breed Association Updates

Editor's Note: Despite our best efforts, mistakes happen. Due to a database glitch, some breed associations were inadvertently left off of the list in the 2019 *Breeders & Products Directory*. Those associations are listed below if you need to get in touch with them. We apologize for this error and have implemented a fix to ensure they make it into next year's print directory. Their information can also be found at [LivestockConservancy.org](http://LivestockConservancy.org).

## Irish Draught Horse Society of North America

4617 Store Ln  
Stevensville, MT 59870  
Phone: (406) 540-2199  
Email: [idhsna@hotmail.com](mailto:idhsna@hotmail.com)  
[www.irishdraught.com](http://www.irishdraught.com)

## Cleveland Bay Horse Society of North America

10774 FM 39 N  
Jewett, TX 75846  
Phone: 817-431-8775  
Email: [info@clevelandbay.org](mailto:info@clevelandbay.org)  
[www.clevelandbay.org](http://www.clevelandbay.org)

## Cornerstone Morgan Horse, Inc.

2568 N. Myrtle Road  
Myrtle Creek, OR 97457  
Phone: 541-860-7273  
Email: [dawnwindmorgans@hotmail.com](mailto:dawnwindmorgans@hotmail.com)  
[www.CornerstoneMorganHorse.com](http://www.CornerstoneMorganHorse.com)

## American Buckeye Poultry Club

10625 Maddie Rd  
Dardanelle, AR 72834  
Phone: 479-970-4241  
Email: [americanbuckeyepoultryclub@gmail.com](mailto:americanbuckeyepoultryclub@gmail.com)  
[www.americanbuckeyepoultryclub.com](http://www.americanbuckeyepoultryclub.com)

## American Rabbit Breeders Association (ARBA)

PO Box 400  
Knox PA 16232-0400  
Phone: (309) 664-7500  
Email: [info@arba.net](mailto:info@arba.net)  
<http://www.arba.net/>



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## Problem with Our Online Classifieds

A recent software update by our website host has caused an unexpected outage of the classifieds system and our developers are working to implement a fix. We hope to have a classifieds service back up and running soon. In the interim, please visit our online *Breeders & Products Directory* to search for animals and products from our members and providers, or refer to your printed directory if you have one.

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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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## FROM THE SCIENCE — DESK —

# Breeding Advice for International Breeds

By **D. P. Spenberg** and **C. R. Couch**

International breeds provide a host of challenges for genetic conservation. Navigating these challenges for the good of the entire breed can be tricky. Breed associations in each country must work well with each other to coordinate the effective management of breeds across international borders.

This discussion is specifically targeted at those breeds with reciprocity for exchange of genetics or registration of animals across international boundaries. This cooperation assures that the breed remains a single gene pool and that management of the breed as a whole is a priority. A few breeds, such as the American Karakul and American Jacob, are international breeds in one sense, but lack the international reciprocity that would keep them as integral parts of the larger breed. Other international breeds, such as Suffolk horses, do have reciprocity and can be managed more holistically.

Some of these rare international breeds are long-term residents in the United States, and fall under the management umbrella of The Livestock Conservancy.

Clydesdale and Shire horses and Devon and Galloway cattle all belong in this category. Others are more recent arrivals, such as Large Black pigs and Leicester Longwool sheep. In most cases these are all longtime standardized breeds with well-established herd books and complete pedigrees. Their breeding is closely monitored in all of the countries in which they occur, so good pedigrees that go back several generations are the general rule. American stewards of these breeds need to maintain the same continuity. Breeding decisions need to be well thought out in order to manage the genetic health of the international breed for future generations.

A host of different strategies have been used over the years for the complex process of managing breeds. Some, such as the Gloucestershire Old Spots pig, originally used a constrained circular/rotational breeding system where the male hogs move on to mate the females of the next group. This was their “color wheel” system. With enough breeding groups this system works fairly well to manage inbreeding, although it does have the peculiar consequence that eventually all hogs are related to one another at least to some degree. They use four breeding groups (red, black, green, and blue), which is somewhat of a bare minimum of groups for this sort of system. The attraction of this system is that it is automatic, so breeders need to make fewer decisions. More recently, the British breeders have backed away from this system to encourage decisions directed at producing and using unrelated stock. As soon as that de-



**Milking Devon cattle, first brought to New England by the Pilgrims in 1623, were one of the earliest international breeds introduced from Europe. Photo by Jeannette Berenger.**

## 2019 World Pork Expo Canceled

The National Pork Producers Council’s board of directors has announced its decision to cancel World Pork Expo 2019 out of an abundance of caution as African swine fever (ASF) continues to spread in China and other parts of Asia. World Pork Expo, held each June at the Iowa State Fairgrounds in Des Moines, hosts approximately 20,000 visitors over three days, including individuals and exhibitors from ASF-positive regions. African swine fever affects only pigs and presents no human health or food safety risks. Visit [www.worldpork.org](http://www.worldpork.org) for more information.

cision is made, breeders need to be more informed and empowered because the breeding choices are no longer as automatic as once they were.

A common strategy for many rare breeds is to pair animals to always minimize the coefficient of inbreeding in the resulting progeny. This strategy has the somewhat surprising outcome that eventually all animals will be related to one another, and at that point no matings will result in a coefficient of zero. This approach also gets cumbersome over time, because as the upcoming generations become more and more related, finding that ideal mate becomes more and more difficult and limits options considerably. This strategy can end up being nearly as constraining as the “color wheel” strategy that relies on moving males onto the next group in a set order. A very real downside is that the automatic aspect of mate selection for inbreeding coefficient diminishes the breeder’s options for pairing animals based on performance or other criteria.

Some breeders put great emphasis on “male lines” and “female lines.” It is important to remember that these refer to the “tail male” line or “tail female” line. What this means is that the animal is identified by its foundation sire through its male ancestors (so, sire, then grandsire, then great grandsire and so on), and similarly for the tail female line. All those animals in between the two tails are equally important to the genetic picture, but with only tail male and female identification of animals,

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# Breeding Advice for International Breeds

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there is no way to actually quantify the many other contributors to that animal's genetic makeup.

A graphic representation might help. In the following pedigree the yellow portion is the "tail male" contribution after four generations of breeding. Similarly, the red portion is the "tail female" contribution. You can see for the animal on the leftmost column, the orange "other" contribution is actually the greatest by far, and comes from those animals ignored by "tail male" and "tail female" designations.

Another breeding strategy, and one I like, is to occasionally line breed, or even inbreed, but this must be done cautiously and always with selected animals (strong, well-conformed, healthy). It is possible to alternate linebreeding with line crossing every other generation. The species that have the advantage of producing litters give breeders plenty of room for selection among littermates, which provides selection opportunities for each litter. In this sort of system, matings do not necessarily need to be repeated again and again because each mating provides plenty of opportunity for selection. The end consequence of this fact is that females can be line bred for some matings, and line crossed for other matings. With selection for vitality and growth the potential negative consequences should be minimal in most cases. The advantage of the linebred animals is that they can then be crossed out to other lines. The critical detail is to assure that unrelated lines remain available for that line crossing stage. This is an important aspect of this strategy, and one that requires good record keeping, good communication among breeders, and a long-term view of the whole process.

Regardless of what breeding scheme is used, it is important to maintain the possibility of unrelated matings down into the future. That usually means subdivision of the population somewhat, so that not all portions are mated together routinely. This does not mean "never," it just means that there is some degree of subdivision. For "reciprocal international breeds" it makes

## Pedigree Tail Example

Animal in Question	Parents	Grandparents	Great Grandparents	Great Great Grandparents

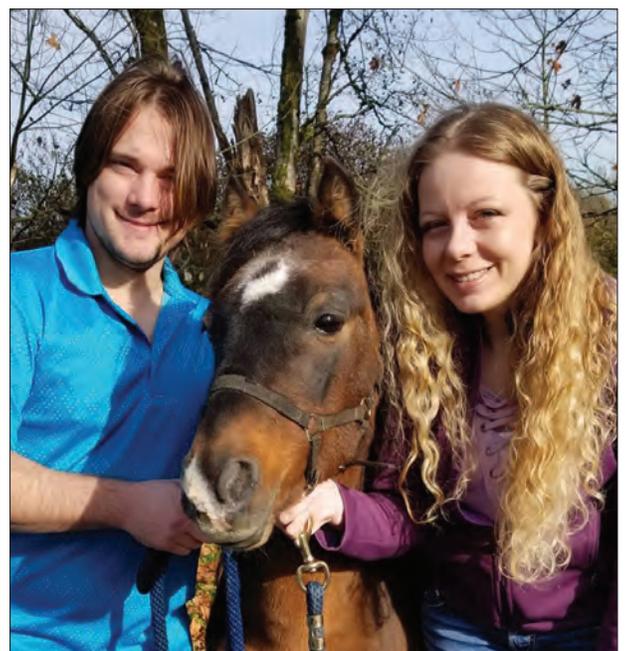
sense to subdivide the breed somewhat to account for the addition of newly imported bloodlines. In most cases and for most breeds this will be British influences, but could also include Australia, New Zealand, and maybe France for a few breeds. In any case, it is always wise to make sure that someone keeps the older U.S. lines going, without much or any of the more recently imported influences. In the case of the Gloucestershire Old Spots, for example, newly imported British lines are available in the United States. The infusion of new

genetics is a boon to the national herd. It is tempting to simply cross lines for their genetic diversity and production value, without regard for the long-term effects of these techniques. Maintaining pure British and pure American lines, as well as crossing the two, preserves the opportunity to line breed, while also allowing line crossing. Breeders must work together to ensure that both lines remain subdivided (pure) so that the line cross is always possible.

Another example is the Red Devon cattle breed, which has recently seen great

## Progress for Caspian Horses

Working with Caspian breeders Anne Lawrence and Taylor and Brenda Grigg, The Livestock Conservancy has collected semen from three rare Caspian horses. The semen is owned in part by the breeders but the remainder is banked with the U.S. Department of Agriculture's National Animal Germplasm Program for long-term conservation. These are the first heritage horses to be banked by the USDA. The bloodlines represented in these stallions are now safe for the future.



popularity of New Zealand influences, to the extent that older American lines are now quite rare. The recommendation to keep American lines of these breeds going is only made for reproductively sound, healthy animals. These have a very important function for long-term crossing with the recent imports. The long-term problem is that if the animals are all crossed up right now, then the distinctiveness of older American lines quickly disappears and the lines can no longer perform this long-term function. They must be kept going, and kept available, for the long-term future vitality of the breeds.

As a final note, “linebreeding” is when animals are mated that have ancestors in common. The most extreme form of linebreeding is inbreeding, when parent is mated to child, or a sister to a brother (whether full or half). This level is extreme, but actually does make sense in some situations to rescue and concentrate influences in danger of disappearing. The important detail is that if the animals produced by such close inbreeding are then crossed with an unrelated mate, the inbreeding coefficient goes back down to zero! The challenge is to maintain unrelated animals so that this is always possible, and such a strategy usually works for most breeds.

At the base of every breeding strategy is the need to be selective. Not every animal that is born is a good candidate for be-

## Mark See

The Livestock Conservancy has been blessed over its many years to have been able to work with many dedicated people as it strives to stave off the loss of biodiversity among livestock and poultry breeds. It is always sad to lose one of those heroes, and we have recently learned of the passing of Mark See.

Mark did exemplary work in diligently finding and saving many old lines of the traditional Cotton Patch goose. Without Mark’s successful efforts this breed’s status and future would be much more precarious than they now are. His work encompassed all phases of the effective conservation of these local landrace treasures: Discover, Secure, and Sustain. His efforts changed the fate of this breed, and all within the breeder community mourn his loss.



ing a breeding animal. As long as breeders are selecting for vigor, conformation, and reproductive fitness, the long-term results should be good. Breeders should always breed to the breed standard, and that standard should be a good, strong one with an eye toward vitality and utility.

Above all, breeders of international rare breeds should keep good records. All mating and production information should be kept neatly and accurately, should be retrievable, and should also be clear enough

that someone other than you can put the information back together and link to specific animals. This helps to avoid losses if and when disaster hits!

These breeding recommendations for international breeds should be taken with the whole picture in mind. Across the entire breed it is important to have breeders and associations keeping an eye out for each of the different breeding schemes and lines so that the breed remains strong and productive well into the future. ❖

## Conservation Updates

*Continued from page 1*

beautiful red and white animals, named for the similarly colored Hereford cattle. They do well in pastured settings as well as in confinement. The show ring has influenced this breed, so we will be keeping an eye on traditional bloodlines of Hereford hogs to ensure the continued contribution of these valuable genetics.

New to the Conservation Priority List this year is the **Highland pony**. With fewer than 200 annual registrations in the United States and a global population of less than 2,000 ponies, this native of Scotland has been placed into The Livestock Conservancy’s Critical category. The breed is also considered Vulnerable in the United Kingdom by Rare Breeds Survival Trust. At least eight bloodlines can be found in the United States, making our population of Highland ponies important for global conservation of the breed.

Every animal needs a job, whether for sport, fiber, meat, milk – or even conservation grazing! Giving breeds a purpose, and careful management and promotion by active, engaged breed associations, are the keys to successful conservation efforts for rare and endangered livestock. ❖



**The Highland Pony has been added to the Critical category of the Conservation Priority List. Photo courtesy of Baroque Farm.**



# THE LIVESTOCK CONSERVANCY™

## Conservation Priority Livestock Breeds 2019

**Critical:** Fewer than 200 annual registrations in the United States and estimated global population less than 2,000. For rabbits, fewer than 50 annual registrations in the United States and estimated global population less than 500.

**Threatened:** Fewer than 1,000 annual registrations in the United States and estimated global population less than 5,000. For rabbits, fewer than 100 annual registrations in the United States and estimated global population less than 1,000.

**Watch:** Fewer than 2,500 annual registrations in the United States and estimated global population less than 10,000. For rabbits, fewer than 200 annual registrations in the United States and estimated global population less than 2,000. Also included for all livestock are breeds that present genetic or numerical concerns or have a limited geographic distribution.

**Recovering:** Breeds that were once listed in another category and have exceeded Watch category numbers but are still in need of monitoring.

**Study:** Breeds that are of genetic interest but either lack definition or lack genetic or historical documentation.

	Critical	Threatened	Watch	Recovering	Study
Cattle	Canadienne Dutch Belted Kerry Lincoln Red <b>Milking Devon</b> Heritage Shorthorn (Native) <sup>1</sup> <b>Randall or Randall Lineback</b> Texas Longhorn (CTLR) <sup>2</sup>	Ancient White Park <b>Florida Cracker</b> <b>Pineywoods</b> Red Poll	Ayrshire Belted Galloway Galloway Guernsey	Ankole-Watusi Red Devon Dexter	<b>Chirikof Island</b> <b>Criollo</b> (North Central Mexican)
Goats	Arapawa San Clemente Island		Spanish	Myotonic or Tennessee <b>Fainting</b> Oberhasli	Golden Guernsey
Pigs	Choctaw Meishan Mulefoot Ossabaw Island	Gloucestershire Old Spots <b>Guinea Hog</b> Large Black <b>Red Wattle</b>	Tamworth	<b>Hereford</b>	Saddleback
Rabbits		<b>American</b> <b>American Chinchilla</b> Belgian Hare Blanc de Hotot Silver <b>Silver Fox</b>	Beveren <b>Giant Chinchilla</b> Lilac Rhineland	Crème d'Argent	Harlequin
Sheep	<b>Florida Cracker</b> <b>Gulf Coast or Gulf Coast Native</b> <b>Hog Island</b> <b>Santa Cruz</b>	Black Welsh Mountain Clun Forest Cotswold Dorset Horn <b>Jacob – American</b> <b>Karakul – American</b> Leicester Longwool Lincoln <b>Navajo-Churro</b> <b>Romeldale / CVM</b>	<b>Barbados Blackbelly</b> Oxford Shropshire <b>St. Croix</b> <b>Tunis</b> Wiltshire Horn	Shetland Southdown	

Breeds unique to North America are printed in bold.

<sup>1</sup> Milking Shorthorns that qualify for the "Native (N)" designation, identifying them as pure, old line, dual purpose Milking Shorthorns, as verified by the AMSS office.

<sup>2</sup> Cattlemen's Texas Longhorn Registry.



# THE LIVESTOCK CONSERVANCY™

## Conservation Priority Equine Breeds 2019

**Critical:** Fewer than 200 annual registrations in the United States and estimated global population less than 2,000.

**Threatened:** Fewer than 1,000 annual registrations in the United States and estimated global population less than 5,000.

**Watch:** Fewer than 2,500 annual registrations in the United States and estimated global population less than 10,000. Also included for all livestock are breeds that present genetic or numerical concerns or have a limited geographic distribution.

**Recovering:** Breeds that were once listed in another category and have exceeded Watch category numbers but are still in need of monitoring.

**Study:** Breeds that are of genetic interest but either lack definition or lack genetic or historical documentation.

	Critical	Threatened	Watch	Recovering	Study
Donkeys	American Mammoth Jackstock Poitou			Miniature Donkey	
Horses	<b>American Cream</b> <b>Banker</b> <sup>1</sup> <b>Canadian</b> Caspian Cleveland Bay Dales Pony Dartmoor Exmoor Fell Pony <b>Florida Cracker</b> <sup>1</sup> <b>Galiceño</b> <sup>1</sup> Hackney Horse Highland Pony <b>Marsh Tacky</b> <sup>1</sup> <b>Morgan – Traditional</b> <sup>2</sup> <b>Newfoundland Pony</b> Suffolk	Akhal-Teke Clydesdale <b>Colonial Spanish</b> <sup>3</sup> <i>Strains:</i> <b>Baca-Chica</b> <b>Choctaw</b> <b>Santa Cruz</b> <b>Sulphur</b> <b>Wilbur-Cruce</b> Gotland Irish Draught Lipizzan <b>Mountain Pleasure/</b> <b>Rocky Mountain</b> Shire		Belgian <sup>4</sup>	California Vaquero <sup>1</sup>

Breeds unique to North America are printed in bold.

<sup>1</sup> Each of these has an independent, stand-alone registry and conservation program. In addition, each has contributed to the Colonial Spanish breed.

<sup>2</sup> Includes horses whose pedigrees are absent of outcrosses after 1930.

<sup>3</sup> This includes several different registries, each with somewhat different goals (SMR, SSMA, SBBOA, AIHR, HOA). Under this umbrella some strains have independent conservation programs and those are noted individually.

<sup>4</sup> Includes Brabant, the European ancestor of the American Belgian, with a distinct type. The Brabant is globally rare.

### Conservation Priority List: Endangered Bloodlines

To assign breeds to the Conservation Priority List (CPL), The Livestock Conservancy uses annual registration numbers to assess breed status in USA populations, along with international census figures for those breeds with international populations. In a few breeds the census can be quite high, but rare bloodlines within the breed can remain seriously endangered. Endangered bloodlines occur in many breeds. The Livestock Conservancy only lists those with validation of old, purebred, traditional status in breeds that have otherwise undergone introgression from other breeds. A few breeds, such as Shorthorns, Texas Longhorns, and Morgans carefully validate these traditional lines, and are listed on the CPL. Bloodlines in many other breeds lack independent validation and identification, which limits The Livestock Conservancy's ability to list these separately from the larger introgressed breed.



# THE LIVESTOCK CONSERVANCY™

## Conservation Priority Poultry Breeds 2019

**Critical:** Fewer than 500 breeding birds in the United States, with five or fewer primary breeding flocks (50 birds or more), and estimated global population less than 1,000.

**Threatened:** Fewer than 1,000 breeding birds in the United States, with seven or fewer primary breeding flocks, and estimated global population less than 5,000.

**Watch:** Fewer than 5,000 breeding birds in the United States, with ten or fewer primary breeding flocks, and estimated global population less than 10,000. Also included are breeds that present genetic or numerical concerns or have a limited geographic distribution.

**Recovering:** Breeds that were once listed in another category and have exceeded Watch category numbers but are still in need of monitoring.

**Study:** Breeds that are of genetic interest but either lack definition or lack genetic or historical documentation.

	Critical	Threatened	Watch	Recovering	Study
Chickens	Campine Crevecoeur <b>Holland</b> La Fleche Malay Modern Game Nankin Redcap Spanish Sultan Yokohama	Aseel <b>Cubalaya</b> Faverolle Houdan Icelandic Lakenvelder Old English Game <b>Rhode Island White</b> Russian Orloff Sebright Spitzhauben	Ancona Andalusian <b>Buckeye</b> Buttercup Catalana <b>Chantecler</b> Cornish <b>Delaware</b> <b>Dominique</b> Dorking Hamburg <b>Java</b> <b>Jersey Giant</b> Langshan Minorca <b>New Hampshire</b> Phoenix Polish <b>Rhode Island Red – Non industrial</b> Shamo Sumatra	Australorp Brahma Cochin Leghorn – Non-industrial <b>Plymouth Rock</b> Sussex	Araucana <sup>1</sup> Large Fowl American Game Manx Rumpy or Persian Rumpless Saipan
Ducks	Aylesbury Dutch Hookbill	Buff or Orpington Magpie Saxony Silver Appleyard	<b>Ancona</b> Campbell <b>Cayuga</b> Rouen – Non-industrial Swedish Welsh Harlequin	Runner or Indian Runner	<b>Australian Spotted</b>
Geese	<b>Cotton Patch</b> Roman Shetland Steinbacher	<b>Pilgrim</b> Pomeranian Sebastopol	African <b>American Buff</b> Chinese Toulouse (Dewlap)		Gray
Turkeys	<b>Beltsville Small White</b>	Black <b>Royal Palm</b> <b>White Holland</b>	<b>Bourbon Red</b> <b>Bronze</b> <b>Narragansett</b> Slate <b>All Other Varieties<sup>2</sup></b>		

<sup>1</sup> Breed identity in poultry breeds is challenging. Many breeders of all kinds (exhibition, production, hatchery) are diligent in breeding standard-bred birds. Other breeders in each category resort to crossbreeding to achieve their goals, and yet promote their birds as standard-bred. The Livestock Conservancy is unable to validate each breeding program, but buyers are encouraged to ask if birds offered for sale are pure-bred and meet breed standards.

<sup>2</sup> Varieties that are distinct but not APA recognized include Chocolate, Jersey Buff, Midget White, Lavender, and a host of other distinct color varieties. Does not include broad-breasted varieties, because they are not endangered.

# Shepherd Profile: Emily Hartman

By Deborah Niemann

*This is part of a series of online Q &A's with shepherds who raise sheep on the Conservation Priority List for wool. To see more, visit our blog, linked to from [www.RareWool.org](http://www.RareWool.org).*

## **Why should a breeder sell the wool from their sheep?**

The real question, is why wouldn't you? Here we have an amazing creature that provides us with not only meat and in many cases, milk... but also a useable, wearable, craftable fleece. In my opinion, sheep are the triple threat of livestock and you can win no matter what!

## **Is it challenging to raise sheep with an eye towards selling their wool? Why or why not?**

Yes it can be. There are so many factors that play into the quality, that when people ARE interested in being put on a waiting list, it's hard to really know how much to expect. Unexpected illnesses can ruin a fleece in an animal that may have had an excellent fleece the year before. Sometimes they get into stuff. For example, my beautiful pure black ewe lamb decided to roll in a bunch of "stickers" on the way down the hill to get shorn. Her fleece was fairly clean up until that point. Also, in the case of Longwools you always ask yourself, should I shear once, or twice a year, because the end product is so different and generally used differently (long locks vs a more "average" staple length). You have to be extremely vigilant to keep the creepy crawlers such as lice and mites at bay. Especially when growing out those fleeces for a year. If you don't keep up, it's difficult to treat a sheep in full fleece.

## **Why have you chosen to sell your wool as raw fleece, roving, yarn, etc rather than in a different form? Or why have you chosen to do all of the above?**

Sort of piggybacking on the previous answer, I am doing my best to offer as wide a range of product as I can. I am attempting to hold a few sheep back from shearing to offer locks, washed and unwashed. I try to offer the unwashed first, and then offer washed and dyed as I get around to it. I think locks offer the largest amount of artistic freedom as there are so many



**Emily shears her own sheep so she can keep a closer watch on their health. Photo courtesy of Emily Hartman.**

things you can do with them. The great thing about Leicester Longwools is that the lambs' fleeces can be next-to-skin soft, while the adults make beautiful lustrous wool perfect for outerwear. I am able to shear twice a year, so I am trying to even it out so that winter/spring shear gets sent to the mill and summer shear left raw (any leftover summer fleeces get sent in to mill after the next shearing). The mill I send to requires a minimum amount for millspun yarn, but not for roving, and since at this point, I don't have much for lamb wool, that dictates that it gets separated out into roving, while the adult fleeces get combined into millspun. Summer fleeces, as I said, I sell raw. I bring them with me to the farmers markets, and they generate a lot of conversation.

## **What is one important thing you learned about sheep management as it relates to selling their wool?**

Sheep health is key. Nutrition, pest management, the whole works. A few sheep may require a little extra attention. If you don't have healthy sheep, you can't expect good wool.

## **What is one surprising thing you learned about coating your sheep – or having sheep that are not coated?**

Mine are not coated. And although I don't think I'd attempt an uncoated sheep of fine wool breeds, the Leicester Longwools (and I'm sure other longwool breeds) tend to actually stay fairly clean. You can shake them out a bit and you're in business. I think this also depends on the way

you feed them as well, since overhead feeders will leave your sheep a mess. Mine are fed on the ground, and in their natural grazing position, they keep fairly clean. They're even cleaner in the summer when they can roam the pasture. If the pen was smaller, and not well maintained, they would be a mess in no time, no doubt.

## **What is one important thing you learned about selling your wool?**

People love to get to know your animals as you do. They love the story that goes with them. Since I don't have a brick and mortar store, it is important to put yourself out there. Since I don't have a store to present to people, my boxes arrive at their doorstep to represent me, so I always make sure my packaging is nicely presented. I think every little detail helps. When I'm at farmers markets, even if I don't sell the wool that day, people love to generate conversation about it and the sheep. Overall it's a LOT of work and also A LOT of fun. ❖

*Emily Hartman raises Leicester Longwool sheep on her farm, Mrs. Hartman's Farmhouse Market ([www.hartmansfarmhousemarket.com](http://www.hartmansfarmhousemarket.com)). You can also find her on Facebook and Instagram @mrs.hartmansfarmhousemarket.*



**The Leicester Longwool is one of the "luster longwool" breeds, so designated for the sheen and brilliance of their wool. Photo courtesy of Emily Hartman.**

# Slow Beef

By Chuck Neely

The worst beef I have ever eaten was 100% grass-fed and finished. And the best beef I have ever put a knife into was also 100% grass-fed and finished. My wife and I call that ribeye the “crying steak” because it brought tears to my eyes as we ate the succulent, marbled slab.

Grass finishing is a lot like winemaking. You can drink “two-buck-chuck” from Trader Joe’s or a great bottle of wine from an excellent vineyard and terroir. Like the incredible variability of wines, beef from each grass farm – with its different soils, breed types, forage types, and animal handling techniques – all offer a highly variable eating experience. Beef terroir!

We keep striving to get better – for our soils, grasses and cattle to be better – and for our beef to be the best grass-fed and grass-finished eating experience our land will create. In eight years you can make a lot of mistakes pasture finishing cattle. But every year we learn and get better.

Research on grass-fed beef led us back-way back in time. One of my pastimes is researching and collecting antique farming books from the U.K. and Scotland. It’s fascinating to read about how graziers in Scotland were raising Galloway cattle for the finest establishments in London – over 150 years ago.

The biggest revelation for us, in this research, is that great grass beef requires a ton of patience – giving the animal time to



**Belted Galloway cattle grazing at Riven Rock Farm. Photo by Chuck Neely**

grow his frame out and then finish off on a diverse sward of good forages. It was preferred back then for a Galloway steer (or bullock, as they call them) to be between three and four years old when finished. To this day, the oldest five-star restaurant in London still maintains a private herd of Galloway cattle, and finishes them out at 42 months old! Wow.

So we tried our own version of the old Scottish ways and finished two steers this past fall at the ripe old ages of 32 and 33 months of age, 6 to 12 months older than most other protocols. The results were astounding. The hanging carcass had a ton more marbling and a full, robust, mouth-watering beef flavor.

And eat without guilt! Marbled fat on a grass-finished beef is a healthy fat, full of antioxidants like CLA, and with healthy Omega 6 to Omega 3 ratios of under 2:1. Grain finished beef has a 15:1 Omega 6 to Omega 3 ratio.

So our new protocol is to have patience with our cattle. We shall sell no beef before its time! We now only finish them after their heritage breed genetics have been fully expressed. We use lush cool season grasses and clovers for the final months of finishing, promoting great nutrition and mineral uptake from our mountain soils.

We say eat Slow Beef, eat BETTER beef, for a healthy, unforgettable meal. ❖

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The Livestock Conservancy would like to give a special thanks to the following individual who recently chose to support the Conservancy and its conservation programs by becoming a life member. For more information on becoming a life member, please contact Ryan Walker at 919-542-5704, ext. 102, or [rwalker@LivestockConservancy.org](mailto:rwalker@LivestockConservancy.org).

**Patricia Lusted**  
Niskayuna, NY

# The Hook-billed Duck

By Jonathan M. Thompson

*This is the first part of a longer article about Dutch Hookbill ducks, available for download on the breed's page at LivestockConservancy.org. If you do not have internet access and would like a paper copy of the full article, contact us and we're happy to send you one.*

Precisely when the domesticated Hook-billed duck first appeared in Europe and, indeed, where it originated, are facts possibly lost to history.

There has been speculation that the Hook-billed duck originated in the Far East. Fueling such speculation is an article in the *Avicultura* magazine (August 1990), in which J. Bonenkamp reports on finding the image of a bird resembling the Hook-billed duck on pieces of Indian brassware; also the set-back placement of the Hook-billed ducks' legs, akin to that in the 'Penguin' or Indian Runner duck of the Malay Archipelago.

However, the precise locations of these brasswares are not known and any images not cited; and, unlike the 'Penguin duck' or Indian Runner duck which, in varying forms, has been located in the Far East, no living specimens resembling the Hook-billed duck have, as yet, been located.

The early writers, Pierre Belon (1517?-1564), Conrad Gesner (1516-1565), and Aldrovandi (1522-1604; this author includes as much myth as he does fact in his

gleanings), all omit any reference concerning a domestic duck with a curiously-formed bill; even the 'compiler', Joannes Jonstonus (1603-1675) neither mentions nor depicts such a duck in his work of 1657.

However, such a bird was noticed and delineated by artists working at the French courts, probably as early as the 1630s.

In 1635, along with other artists, the French painter and engraver, Nicolas Robert (1614-1685), was engaged by Gaston d'Orléons (1608-1660), the younger brother of Louis XIII of France, to paint the collection of plants, animals and birds kept at Blois. After the death of d'Orléons, Robert became miniaturist to Louis XIV, and between 1664 and 1674 he was commissioned to paint the collections at the Jardin du Roi in Paris and at Versailles. He produced a folio of two hundred meticulous ornithological paintings, among which are studies of ducks with hooked/downward curving bills (Figures 1 and 2). Following such a prestigious appointment, Robert received commissions from wealthy courtiers and amateur collectors.

The genus name (in Figure 1), *Mergus*, is a Latin word used by Pliny and other Roman authors referring to any unspecified water-bird, possibly indicating the subject matter is new, or previously unknown to science at that time. The image, as it appears to modern eyes, is the depiction of a female duck, of grey plumage with white flight feathers and white markings to the head and neck and with an abnormally downward-curved / hooked bill.

The image in Figure 2 presents a drake, here titled genus *Anas*, which displays

some colour dilution from the Wild, or Mallard duck; and again shows white flight feathers and white feathering in the head and neck, and with an abnormal bill.

It is in 1676 that mention is made of the Hook-billed duck in an English publication. Francis Willughby (1635-1672) was born into a good family and studied at Cambridge University under the naturalist, John Ray (1627-1705). Between 1662 and 1666 Willughby and Ray toured Great Britain and the European continent, and upon returning to England Willughby made preparations to publish his observations on the birds they had studied.

Tragically, Willughby died of pleurisy in 1672, before he finished compiling his work, which was eventually completed and published by Ray in 1676 with a Latin text under the title of *Ornithologiae Libri Tres*. It is an important work, revolutionizing ornithological taxonomy by organizing species according to their physical characteristics for the first time. The image TAB LXXV from this book (Figure 3) is titled *Anas rostro adunco The Hook-bill'd Duck*.

Two years after the publication of *Ornithologiae Libri Tres*, the same illustration, TAB LXXV., appears in Ray's enlarged and corrected edition published with an English text entitled *The Ornithology of Francis Willughby of Middleton in the County of Warwick*.

John Ray's 1678 edition states on page 381:

*The hooked-bill'd Duck.*

*In shape of body and outward lineaments it is very like the common tame Duck; differs chiefly in the Bill, which is*

*continued on next page*



**Figure 1. *Mergus anatiformis cyphorhynchus* ~ Plongeon à bec courbé / Diver with curved beak. Attributed by Christie's to Nicolas Robert (1614-1685) or studio.**



**Figure 2. *Anas torquatus mas Ornit* ~ Canard ou espece de Sarcelle / Duck or species of Teal. Museum nationale d'Histoire naturelle, Paris; Attributed to Nicolas Robert (1614-1685).**

# The Hook-billed Duck

Continued from previous page

broad, something longer than the common Ducks, and bending moderately downward. The Head also is lesser and slenderer than the common Ducks. It is said to be a better layer.

As Tim Birkhead (*The Wonderful Mr. Willughby* 2018) puts it:

*Willughby was from a fairly, but not staggeringly, wealthy family who were keen on book learning. When he went up to the University of Cambridge as an undergraduate at the age of 17, one of his tutors was John Ray. The two of them hit it off and they embraced this new way of thinking about the natural world. That new way was to not trust the ancients, like Aristotle, not take somebody else's word for it – but to find evidence and see things with your own eyes.*

I concur wholeheartedly with the last sentence; it is as relevant to current writing as much as it is to the ancient. I have lived by “De omnibus dubitandum”, when Prof. Dr. Wolfgang Rudolph of Rostock University, first made me aware of it in 1984; and it has always held me in good stead.

Birds resembling a crested Hook-billed duck are portrayed in the paintings (Figures 4 and 5) of the Dutch artist Melchior d'Hondecoeter (1636-1695).

The presence of the Hook-billed duck



**Fig. 3. Detail from TAB LXXV.**

in France, Britain, and Holland is recorded in portraiture and text from the 1630s onwards. It is possible, but not, as yet, provable, that the birds were shipped to Europe by the Dutch East India Company, or Vereenigde Oost-Indische Compagnie (United East India Company), which traded chiefly in valuable spices obtained in Indonesia 1603-1800. Another source could be the British-formed East India Company, established in 1600 and traded until 1874; although this company's activities were mainly confined to trading with India after withdrawing its operations from Indonesia, except at Banten / Bantam, in 1620.

John Ray in his own work of 1713, *Synopsis methodica*

*Avium*, p.150, places his Hook-billed duck in the list of *Anates Domesticae* / Domesticated Ducks as *Anas domestica rostris adunco*; and follows Willughby's description.

Fifty years after Willughby's mention of the Hook-billed duck, another English writer, Richard Bradley (1688-1732) in *A General Treatise of Husbandry and Gardening* of 1726, Vol. II., referring to the management of rivers and ponds, states on page 101:

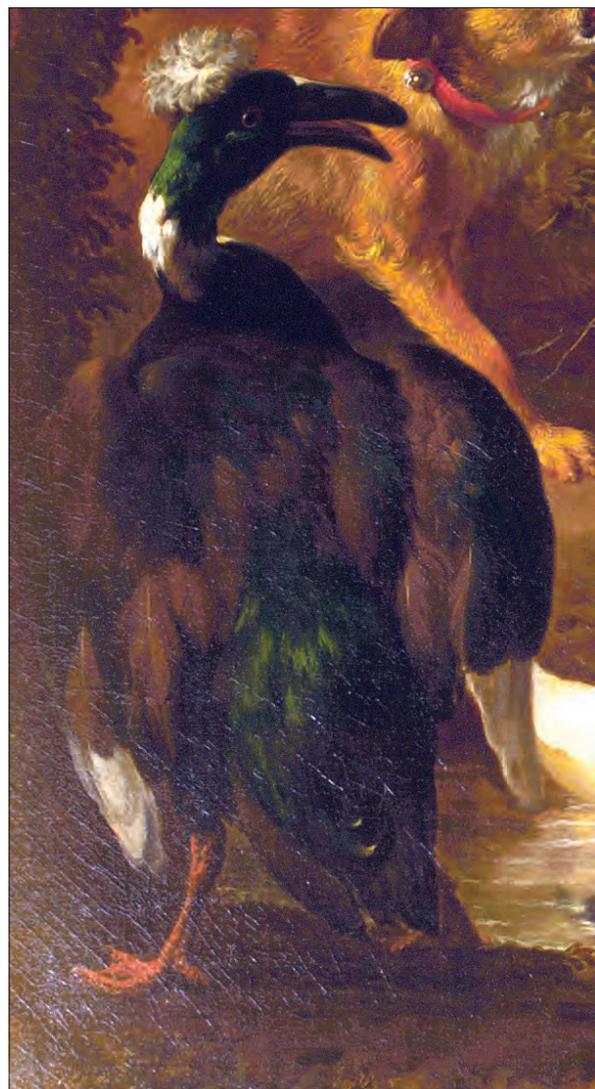
*On this Water you may likewise keep six Couple of Ducks, which for laying and Encrease, should be of the nook'd Bill sort, and from that Kind one might have young ones fit for killing about the latter end of March, as I have seen this Year sold in the London Poulterers' Shops at 2s. apiece ....*

Bradley's “nook'd Bill” is taken to refer to the Hook-billed duck.

Elazear Albin (c.1680-c. 1742) was an



**Figure 4. Crested Hook-billed duck, duckling, and Muscovy drake. Details of images by Melchior d'Hondecoeter (1636-1695), circa 1680. Source: Wikicommons**



**Figure 5. Hook-billed duck with a crest, showing white on the neck and in the flight feathers.**

art teacher of German descent and had changed his surname from Weiss when he arrived to work in London from 1708. In 1731 the first volume of his *A Natural History of Birds* was published; volume II followed in 1734, and volume III in 1738.

The title page and preface to the first volume informs the reader that Albin and his daughter, Elizabeth, made their drawings from living specimens; engravings were made from these, which they both hand colored. Except for a few instances, the description accompanying each species is also based on observation of such living specimens.

Each of the volumes contains a full-page illustration of a bird and a page of text describing it. In the case of the Hook-billed duck, Albin presents hand-colored engravings of both sexes (Figures 7 and 8) in the second volume in 1734.

It is worth noting that the images by Robert (Figures 1 and 2) both have white flight feathers; Willughby's bird presents a light-coloured throat with a single eyestripe; and the birds portrayed by both d'Hondecoeter (Fig.4.) and Albin (Figures 7 and 8) have a white throat/upper-breast/bib, with white flight feathers. Albin's birds also have the

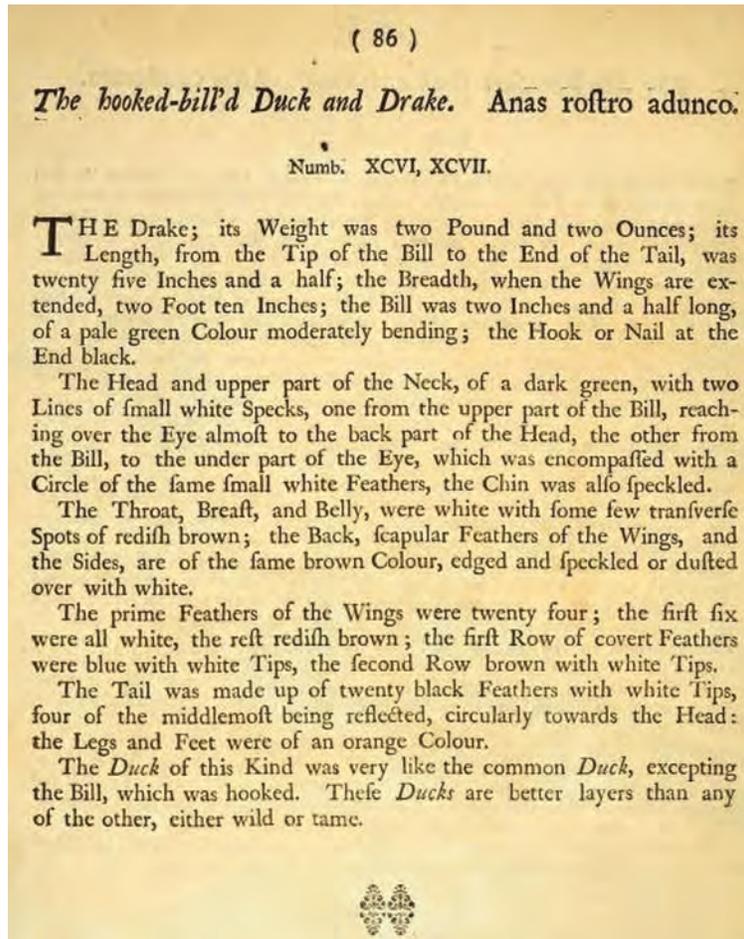


Figure 6. Albin's *A Natural History of Birds*, Vol. II, 1734, p.86. Source: *The Internet Archive*

addition of white eye-stripes, suggesting that the birds possess this 'dilution' and white breast from the earliest times.

#### About the Author

Jonathan M. Thompson was born in 1947 in the U.K. and has been surrounded

to impart the involvement of the early breeders as a point of historical importance, and seeks to address the historical inaccuracies that have been so often perpetuated in print, and for the advancement of the truth. ❖



Figure 7. Hook-bill'd duck *Anas rostro adunca* fem. Source: *The Internet Archive*.



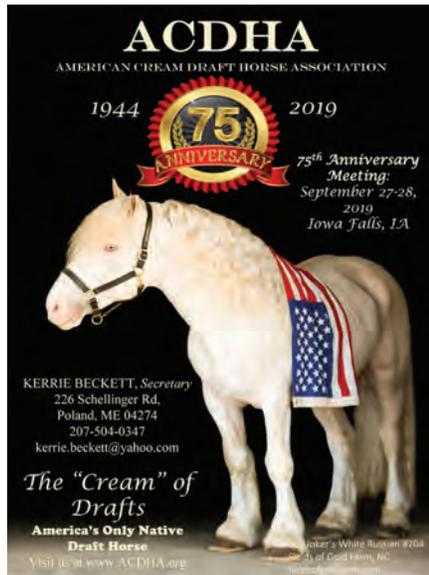
Figure 8. Hook-bill'd drake *Anas rostro adunca* Mas. Source: *The Internet Archive*.

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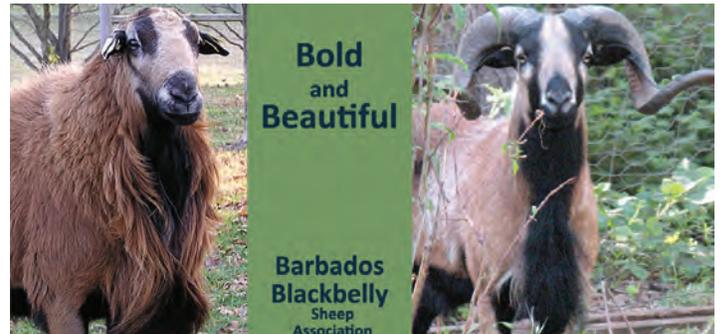
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## CALENDAR

★★ denotes Livestock Conservancy event  
★ denotes Conservancy participation  
*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.*

### May

★★ **May 19-25 – International Heritage Breeds Week** will be held worldwide to raise awareness of endangered Heritage breeds of livestock and poultry. Heritage breed farmers and the public are encouraged to spread the word throughout their networks. The week of awareness culminates with Heritage Breeds Day, when many farms, ranches, and organizations will hold local events such as farm tours, workshops, or lectures to raise awareness in their communities. Visit [www.HeritageBreedsWeek.org](http://www.HeritageBreedsWeek.org) to learn more.

**May 25 – The 2019 Spring Heritage Breeds Festival** will be held in Riceville, TN. Several different Heritage breeds will be on display, as well as vendors of soaps from artisans who source local ingredients, candles, food goods, and more. Visit <https://buchanansbarnyard.com/2019-spring-heritage-breeds-festival> for more information.

### June

**June 8 – The SVF Annual Visitors Day** will be held in Newport, RI. Free self-guided tours through the historic Swiss Village; peek into the state-of-the-art facilities and meet the SVF laboratory, veterinary, and animal care staff; visit a rare Tennessee myotonic goat born from a frozen embryo; attend live cryogenics and sheep shearing demonstrations; and shop SVF's selection of farm products and heritage breed meat. Visit [www.svfoundation.org/news/2018-annual-visitors-day/](http://www.svfoundation.org/news/2018-annual-visitors-day/) for more information.

**June 14-15 – The Sheep is Life Celebration** will be held in Shiprock, NM. Visit <http://navajolifeway.org> for more information.

### July

**July 5-7 – The Black Sheep Gathering** will be held in Albany, OR. Visit [www.blacksheepgathering.org](http://www.blacksheepgathering.org) for more information.

★★ **The Mother Earth News Fair** is being held at various locations around the country over the next few months. This 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.

**June 1-2** – Frederick, MD

**August 3-4** – Albany, OR

**September 13-15** – Seven Springs, PA

**October 19-20** – Topeka, KS

### August

**August 12-14 – The Nebraska Grazing Conference** will be held in Kearney, NE. Visit <https://grassland.unl.edu/> for more information.

### September

**September 5-7 – The 2019 Rocky Mountain Horse Association International Grand Championship Horse Show** will be held at the Kentucky Horse Park. Visit <https://www.rmhorse.com> or email [executivedirector@rmhorse.com](mailto:executivedirector@rmhorse.com) for more information.

**September 28-29 – The Oregon Flock & Fiber Festival** will be held in Canby, OR. The festival includes workshops, demonstrations, livestock shows, seminars, and kids' activities. Visit [www.flockandfiber-festival.com](http://www.flockandfiber-festival.com) for more information.

### October

**October 5-6 – The Vermont Sheep & Wool Festival** will be held in Tunbridge, VT. Visit [www.vtsheepandwoolfest.com](http://www.vtsheepandwoolfest.com) for more information.

★★ **October 24-27 – The Heritage Livestock Conference** will be held in Santa Rosa, CA. Visit [LivestockConference.org](http://LivestockConference.org) for more information.

### December

★★ **December 31 – DEADLINE to update information** and submit ads for the Livestock Conservancy's 2020 Breeders and Products Directory. If needed, log in to update your information at [LivestockConservancy.org](http://LivestockConservancy.org). Email Ryan Walker or call 919-542-5704 for more information about advertising in the directory.