It’s exciting to bring lambs home! As wonderful as it is for us to have new critters on the farm, though, it’s a big change for the lambs, and there is always some stress involved for them. The good news is that there are some things we can do to help them feel safe and settle into their new environment as smoothly as possible. If we understand that they’ve just left everything they’ve ever known (where their hay is, where their water is, where the gate to their pasture is, what time of day their siblings or friends head back to shelter, the sound of their mother’s unique ‘baaaa,’ what their humans look like or sound like, etc.), we can help them adjust to their new surroundings with reduced anxiety.

Social Security
Sheep instinctively flock together. They are extremely social creatures, and a lamb brought home alone will initially have a much higher stress level than a group of lambs will. Whenever possible, consider bringing two (or more) lambs home. American Blackbelly ewes are particularly affectionate with their young so if your new lambs have just been weaned, they’ll be missing this loving attention from their mother. If they’re twins, they’ll also be missing the inseparable bond they had with their sibling. Bringing a twin set home is ideal, but not always possible.

Quarantine and “Getting to Know You” Time
If you have other animals, it’s a good idea to quarantine new stock for a full month before they go with your existing flock. It takes a lot of time and effort to maintain a healthy flock, so it’s worth taking this precaution to rule out the spread of disease while the lambs get to know you and you get to know them. During the quarantine month, the new lambs do a lot of listening to the sounds around them, particularly the main flock. They gain awareness of routines. They learn who they can trust. They become familiar with the dogs, cats, chickens, and whoever else lives on the farm. Quarantine time doesn’t have to be like solitary confinement—it’s a great opportunity to work with the newcomers and gain their trust.

continued on page 2
New Lambs

Water
Clean, fresh water should be available all the time in a container that is easy for lambs to reach into and is made of material that is safe for sheep. Check the water daily to be sure no manure pellets or hay pieces are in it. If this happens, start over with clean water after rinsing the container.

Food
Provide access to good quality hay or pasture grass at all times. If your new lambs haven’t previously been eating grass, gradually expose them to grass for short periods before they have full access to pasture. This will prevent bloating and other digestive complications. Give lambs a bit of hay each morning before going onto pasture, particularly if the grass is wet from rain or dew. American Blackbelly lambs and sheep love eating brush and tree leaves.

Other feeds can include grains, alfalfa pellets, and commercially prepared mixtures. As with pasture, introduce any new feeds in small amounts, gradually increasing overtime to allow the necessary digestive adjustments to take place in the rumen. Grain, such as oats, can be a good supplement in the fall when pasture isn’t as lush and through the winter if sheep are on a hay diet.

Salt and Minerals
Lambs and adult sheep should always have salt and minerals available. Both can be loose or in commercially prepared blocks. Your local feed dealers or sheep association should know which minerals are recommended for sheep in your area (crops grown in soils deficient in selenium, for example, cannot provide sheep with adequate selenium so it must be supplemented). Minerals and salt/mineral blocks formulated for cattle and horses are not suitable for sheep—they usually contain levels of copper that are too high for sheep.

Shelter
Your new sheep will need an area to feel safe from other farm animals, predators, and the weather (rain, snow, wind, cold, heat…). The shelter needs a roof and at least three sides. If a four-sided shelter is used, there should be a window and door that can open for ventilation. Bedding of shavings, straw, or hay can be cleaned out easily. Be sure to check the area for anything that lambs could get their heads or legs stuck in, or their eyes poked by. Remove anything that is remotely unsafe. If there’s a way to get stuck or injured, lambs will find it!

Exercise
Access to a fenced outside area is important. If your lambs are spending some time inside at first, even that should be big enough to allow for lots of movement—young sheep like to jump and play. Again, check for safety hazards wherever your lambs will be.

Medical
While your new lambs are still in their quarantine period, you can learn a lot about what their ‘normal’ is by watching them eat and chew their cud and by watching for healthy pellets coming out the other end. Hopefully you were able to talk with their previous owner to learn about the health status of his flock and about any vaccinations they may have already had. Many American Blackbelly breeders do not use vaccines or wormers, and this is all part of the natural disease resistance of the breed. Check the hooves of your new lambs if you didn’t prior to purchase. Young lambs shouldn’t need a major hoof trim, but checking their hooves will familiarize you with their feet and provide you with the opportunity to be sure the feet are sound.

Work with Natural Temperament
American Blackbelly sheep, and their lambs, are incredibly intelligent and have heightened instincts when it comes to their own safety around predators and the unfamiliar. This includes being frightened by confinement if they haven’t yet been in a small space. If your new lambs were running freely on pasture with their mothers, be prepared for some panic when they’re moved into a barn or a pen. Their instincts will be to run as far away from you as possible if they’re in an open area, or alternatively to try to jump out of a pen if they are confined. This jumping can include trying to jump through you or headlong into a wall. Try not to let this discourage you. Respect that they need space around them and they’ll calm down with your kind, calm, steady manner as you feed and care for them. Grain goes a long way in establishing trust, and they’ll start eating from a bucket on the ground, then from a bucket you’re holding, then eventually from your hand.

Good luck with your new American Blackbelly lambs and have fun getting to know them! ✘
What Is Conservation Breeding?


Part 1: Background Information

Breeders of purebred animals commonly employ one or more of the following breeding systems: inbreeding, linebreeding, and linecrossing. Each has advantages and disadvantages, and a breeder may wish to use only one system, or all three at different points to reach different goals.

Inbreeding: Defined as “mating together animals which are related so that the resulting offspring have one or more ancestors that occur on both the sire’s side and the dam’s side of the pedigree.” Close inbreeding would include the mating of full siblings, or father to daughter; more distant inbreeding might involve second cousins.

While inbreeding can be an emotionally charged subject, in itself it is neither good nor bad. Inbreeding tends to bring recessive traits (in St. Croix, these would include horns and colors other than white) to the surface; because of this, it should always be coupled with selection for excellent breed characteristics and the strict culling of individuals with undesirable traits. Used in this way, inbreeding tends to increase uniformity and consistency within a flock, and it has been used in the formation of most breeds. The St. Croix breed started with only 22 bred ewes and 3 rams, and therefore all mating within the breed today involves some degree of inbreeding.

However, for practical purposes, recent relatives have the most genetic impact and usually only the first 5 generations of the pedigree are considered when inbreeding calculations are made.

Inbreeding can lead to “inbreeding depression”, a reduction in vigor, fertility and disease resistance. Studies of wool sheep suggest that each 1% increase in inbreeding corresponds to a reduction of 1.4 lambs born per 100 ewes bred, a reduction of 2.78 lambs weaned per ewe lambing, and a loss of 2.44 pounds per lamb weaned (Lamberson et al. 1984, as presented in the Sheep Production Handbook, 1995). However, breeds and populations differ in their tolerance to inbreeding depression; a general guideline used by the American Livestock Breeds Conservancy (ALBC) is to keep inbreeding below 5% per generation, and 30% in any individual.

Linebreeding: A form of inbreeding, linebreeding involves concentration of a particular ancestor within a pedigree (rather than several ancestors, as in other forms of inbreeding). Usually, this individual is a particularly excellent representative of the breed. The goal is to create a flock as much like this individual as possible, so matings often involve breeding half-brother to half-sister.

Like inbreeding, linebreeding reduces the variation within the flock, making the individuals more uniform and therefore more predictable. Again, the possible risk is inbreeding depression, including reduced vigor and reproductive performance. Strong selection and strict culling are necessary in a successful linebreeding program.

Linecrossing: A line (or strain) is a group of animals that are more closely related to each other than to the population as a whole. They might be the product of an inbreeding or linebreeding program. Linecrossing is the mating of individuals from one such line to those of another line. Generally, linecross individuals will show greater vigor, better growth, and more ‘bloom’, or ‘presence’ than individuals from either of the parent lines for at least the first generation.

Thus, linecross individuals are more likely to succeed in the show ring. Linecrossing can also be used to bring new vigor into an inbred or linecross flock.

Which is the best? Each of these three breeding systems have advantages and disadvantages. If the goal is a flock with high predictability and low variability between individuals, then some degree of inbreeding or linebreeding will help the breeder achieve this goal. Individuals from such flocks will produce lambs much like themselves.

If, however, the breeder’s goal is to produce excellent individuals, then linecrossing may be the better approach. These outstanding individual sheep may not be consistent in the types of lambs they produce, however, and may not be able to produce lambs as good as themselves.

One advantage of a Conservation Breeding plan is that it can allow a breeder to include advantages of both linecrossing and linebreeding within a relatively simple program.

Part 2: Conservation Breeding

So now that we have a common set of definitions, we can come back to the original question: What is Conservation Breeding?

Conservation breeding can be described as a breeding program that protects genetic diversity within a breed. Genetic diversity within a breed is necessary for the breed’s long-term well-being and commercial utility. The breed benefits from the presence of many lines, as these distinctive genetic groups provide the material for linecrossing. If the distinct lines within the breed are lost, then there are no longer any groups within the breed to mate with to increase vigor, reproductive measures, and disease resistance,
or to avoid a widespread negative trait; it also becomes more difficult to create an outstanding individual with bloom and presence. In extreme cases, breeders may be forced to bring individuals in from outside of the breed to address genetic problems caused by loss of genetic diversity.

Conservation breeding is designed to help a breeder maintain one or more lines, while also reducing inbreeding to manageable levels. In a conservation plan, each line of more closely related individuals is managed as a unit. This unit is alternately bred to a ram from within the line (linebred) and to rams from outside the line (linecross). All daughters are retained in the line, but linecross sons are not retained for breeding. The line as a whole retains its genetic distinctiveness, but inbreeding is reduced as the line consists of individuals with both more and less inbreeding.

Part 3: An Example of a Conservation Breeding Program

While there is no single, simple recipe that can be applied to all breeds or circumstances, the ALBC has designed a breeding plan to illustrate key requirements and to allow a breeder to more easily manage a flock within a conservation breeding program. This plan allows a breeder to keep three lines, but to use only one ram per year on his or her flock, by managing the three as one unit and using rams from different lines in different years. Each ram is used for only 1 year in the flock, so that his genetic influence is not excessive, and the genetic diversity within the line can be retained.

First, three groups of sheep must be identified to form the lines. Each group should be of approximately equal size, and consist of a number of ewes and 1 or more rams.

<table>
<thead>
<tr>
<th>Cycle</th>
<th>Ram used</th>
<th>Ewes bred</th>
<th>Offspring Produced</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>A, B, C</td>
<td>A/B, A/C</td>
</tr>
<tr>
<td>2</td>
<td>B</td>
<td>A, B, C</td>
<td>B/A, B/C, B/AB</td>
</tr>
<tr>
<td>3</td>
<td>C</td>
<td>A, B, C</td>
<td>C/A, C/B, C/AB, C/BC, C/BAC</td>
</tr>
</tbody>
</table>

Ideally, the sheep within a group should be more related to each other than to the flock as a whole, but the method of grouping is not critical. For instance, groups could be made by pedigree, with all descendants of a particular sire or dam in the same group. Or, if the flock has been built from several other flocks, the groups can be formed according to these foundation flocks. These groups will then be considered lines within the flock, and will be designated in this discussion as lines A, B and C.

In the first cycle, the ram from Line A will be used on the entire flock. Ewe lambs that are sound representatives of the breed are retained in their mother's lines, but may produce progeny for more than one line. For instance, lambs sired by the A-line ram and out of A-line ewes will be A/A (linebred, more than ½ A), but lambs sired by the A-line ram and out of B-line ewes will be A/B (linecross, with no line more than ½) and can produce lambs for the B line when bred to a future B-line ram, or for the A-line when bred to a future A-line ram. Ram lambs are kept only out of A-line ewes, and when mature, the best A-line ram is used for breeding (see cycle 4).

In the second cycle, the ram from the B-line is mated to all the ewes in the flock. Again, both linebred (B/B) and linecross (B/A, B/C) lambs are produced. Ewe lambs are retained in their mother's lines, but ram lambs are retained only out of B-line ewes.

The key to this breeding program is that the genetic makeup of each line is alternating between inbred (linebred) and outbred (linecross). The distinct genetic identity of the line is retained, while the linecross individuals provide input of new genes, reducing the amount of inbreeding that the line accumulates. These linecross animals may also show hybrid vigor. Inbreeding is occurring in as many directions as there are bloodlines, so the genetic distance between the lines is maintained through time.

In contrast, most breeding programs attempt to reduce inbreeding across the entire flock at the same time. The consequence is that inbreeding slowly accumulates in the same direction throughout the flock. Thus, there is no outcross available within the flock and the breeder must seek outside the flock to bring in new vigor or to address other inbreeding problems. If other breeders have used similar strategies in managing their flocks, there may not be any flocks with enough genetic distance remaining to provide a true linecross, and the vigor sought may not be obtainable within the breed.

For a conservation breeding program to succeed, there must be enough individuals within each line to produce a good replacement male and several replacement females at every breeding cycle. Additional animals are required if the breeder wishes to select for better conformation, size, or production. The ALBC suggests a minimum of 10 females per line (including both linebred and linecross females). However, if your flock management results in a large percentage of twins and triplets, this number can be reduced somewhat.

Part 4: Three Disadvantages of Conservation Breeding

1. Rams within this program have a short breeding career, since use of a ram for more than a season or two will lead to a genetic bottleneck, that is, a reduction in the genetic diversity contained within a line. This can be frustrating for breeders who wish to develop and use an outstanding male over many years.

2. Selection of breeding animals must focus on the benefits of the animal to the entire flock, rather than on the traits of that individual alone. For instance, a breeder might select a moderately inbred ram even when a linecrossed ram has superior conformation. The inbred ram is expected to produce individuals more like himself than is the linecrossed ram; the inbred ram also works to conserve the line that produced him. The outstanding linecross rams can be sold to other breeders.

3. Finally, for a conservation program to succeed, the breeder must focus on longterm objectives and must break away from many established practices in animal breeding. This can be difficult for many breeders.

For more information, please read A Conservation Breeding Handbook, contact the ALBC, or contact the author of this summary.

What Is a Coefficient of Inbreeding?

A coefficient of inbreeding is a measure of how much homozygosity we expect as a consequence of inbreeding. Genes are said to be heterozygous when an individual has two dissimilar genes for a trait; when the two genes are the same, the individual is homozygous for that trait (or that gene pair). We don’t have the technology to measure the actual gene combinations, but we can calculate the probability the genes will be the same by looking at the pedigree.

Each parent contributes 50% of their genes to their offspring. Thus, half-siblings like Ram B and Ewe C in the example below have 50% of their genes in common with Ram D, since they are both fathered by Ram D. But Ram B and Ewe C may have from 0 to 50% of their genes in common with each other – that is, of the 50% of the Ram D genes that Ram B received, somewhere between all or none of those genes may have also been sent on the his half-sibling Ewe C. On average, they will have received the same genes from Ram D half the time – so they should share 25% of their genes with each other.

Now, if the half-siblings are bred together, they each contribute half of their Ram D genes (25%) to their offspring. On average, their offspring are expected to get the same Ram D genes from Ram B and Ewe C half the time – so Sheep A is expected to be homozygous for 12.5% of its genes.
Have you seen the new Book of Registry and the new registration certificates? If not, go to http://www.blackbellysheep.org/db/animals_p.php and search the Book of Registry. When you register or transfer a sheep, you will get the new certificate, which includes a pedigree and transfer of ownership form on the back.

"WOW! These new registration certificates with the pedigree are great! And the registration number explanation is awesome; I never knew about that! If I send my old registrations in with $5.00 for each, can I get them replaced with the new version? That is so helpful when trying to figure out which certificate goes with which sheep at sale time or breeding time."

Blaine Gillis
Guillis Farm
Beckville, Texas

The new database, which produces these, uses electronic photos. So if you can, send electronic photos to register your sheep. Please crop them, and make them 2MB or less if you have that capability. At the same time, you can also send a scan of the registration information. Email to registrar@blackbellysheep.org and your certificates will go out as soon as the Registrar receives your check.

Conservation Breeding

Table 2. Possible relationships between a ewe and a ram, and the resulting coefficient of inbreeding for their offspring

<table>
<thead>
<tr>
<th>Relationship between the parents</th>
<th>Coefficient of inbreeding for the offspring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Father-daughter, mother-son</td>
<td>25%</td>
</tr>
<tr>
<td>Half-siblings</td>
<td>12.5%</td>
</tr>
<tr>
<td>Grandparent-grandchild</td>
<td>6.25%</td>
</tr>
<tr>
<td>First cousins</td>
<td>6.25%</td>
</tr>
</tbody>
</table>

Some Software Options

It is much easier to use a software program to calculate coefficients of inbreeding than to calculate them by hand. There are various software programs available for this purpose, from free-ware to relatively expensive pedigree programs. Here are two:

Breedmate/Pedigree-X (www.breedmate.com)
The Breed Mate family of Pedigree Software Packages covers dogs, cats, horses and other animals. The software must be purchased; $50

Red Setter Pedigree Program (www.nrsftc.com/Pedigree/index.htm)
FREE! pedigree software. Designed for use with Red Setter dogs, can be easily modified to keep track of sheep pedigrees.

New Registration Certificates

When multiple ancestors are found on both the sire and the dam’s pedigree, then the calculations for coefficient of inbreeding become more complicated. A thorough discussion of two different ways of calculating a COI, and the errors involved in using only five generations of data to do so (using Thoroughbred horse pedigrees), is provided in “Coefficients of Inbreeding: An Investigation into Wright's Equation and Hardiman's Method” at http://www.highflyer.supanet.com/coefficient.htm
Q: I am trying to predator-proof my farm and am debating between getting a burro or llama or guardian dog. Which is best?

A: {via BBSAI member Mark Winternute }

Having the “right” llama or donkey can be very helpful. Unfortunately getting the “right” animal is not automatic. We have had three llamas. The mature female wanted to kill the baby lambs. The mature male just adored the baby lambs but ignored them when they reached weaning age. The third llama we still have is a leader but I have never seen her show much if any protective behavior. For sure there is no more alert or coordinated creature alive than a llama. Those long ears and big eyes can pick out anything! It is like radar and laser beams! We have two female donkeys as well. We have to remove them from the birthing ewes because they want to raise the lambs as their babies. So when the lambs start coming we kick the llama and the donkeys out to the perimeter fields. The donkeys might be of some defense if the canine is not very big. We have several Great Pyrenees cross livestock guardian dogs. The donkeys are intimidated by them and have agreed to just stay away from those big dogs.

The dogs are easily the best defense we have to predators. We have one that believes the best defense is a strong offense and he runs the perimeter through the night. He is totally scarred up at 1.5 years old. We have another dog that believes the best offense is a good defense and stays with the sheep through the night. Both of those dogs sleep with the sheep throughout the day. We have ewes that have sought the dogs out to give birth to their lambs next to them. The dogs observe but do not mess with the lambs. We also have ewes that do not like the dogs and will stomp their foot or hit the dogs. The dogs do not retaliate but lay there and be submissive.

My livestock guardian dogs are bigger than a coyote and can go under, through, or over any fence. I have electric fence running at 18000 volts and my dogs know how to get to the other side. If my fence is porous to my dogs it is porous to coyote. I have seen my dogs go through field fence. I just knew they were going to get stuck. And my dogs just knew they would not get stuck.

I do not think I will ever be predator proof on my farm. But the predators know that there is risk involved in preying on my farm. Predators do not have health insurance and prefer to avoid potential injuries.

Q: My sheep have overgrazed my small pasture, which contains several bare spots and plenty of knapweed and leafy sparge. How can I continue to irrigate the pasture and also help prevent further deterioration?

A: In order to preserve your grass stand, always let the grass fully recover between grazing events. You can tell if a grass is fully recovered with this simple trick: follow an individual grass stem down to its base. If the lowest leaf right near the ground is either brown or has a brown tip, that grass has recovered from the last time it was grazed. This is a simple management procedure that too few grazers employ and it is the most important procedure in all of grazing. By letting plants recover, you will make it easier for them to make it through the winter, have healthier stands and healthier soil. In general, it takes about four to five weeks for a grass plant to recover, depending on the species.

Another practice you can employ to help your grass stand is to move your sheep out of their paddock they are grazing when the grass is still 6 inches or so tall. Do not let them eat it down beyond that if you can help it. This leaves some “solar collectors” still intact on the grass plant and it can readily begin to start growing back. That way, it does not have to rely on stored carbohydrates to start its growth again. This will contribute to the overall health of your grasses in your pasture.

Q: I want to take the ram out of the ewe pasture and put him back with the other rams. How is best to do this so we don’t have a ramming fest? He accidentally got in with them a while back and they about killed him. I really don’t want to repeat that.

A: When reintroducing rams, put them in the smallest space possible so that they cannot get sufficient “back up room” to do much damage when they head butt. Crowd them like that for at least 24 hours and then enlarge the space a little and see if they have settled down. They have to sort this out themselves but you can help them do it without hurting each other.

Q: I have an animal-loving friend who has been telling me that I should have a building where I secure my sheep every night to keep them safe and to observe and help them with lambing. All I have now is a covered area where I feed them hay and grain when the pasture is not producing good nutritional feed. This season, 4 out of 13 lambs died at birth.

A: I suggest you follow your friend’s advice and build a suitable enclosure for your sheep. Sheep minimally need a windbreak and preferably an enclosed building where they can get out of the weather. I’m not suggesting that lack of shelter caused your lambing problems, but lack of...
Ask the BBSAI

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shelter probably added to other underlying problems with your ewes.

Blackbelly sheep don’t necessarily need a lot of help with lambing (unlike wool breeds of sheep). But by providing them an enclosed building, they can lamb inside if they choose. My ewes rarely lamb in pasture when they have a choice of lambing in or near their sheep shed. The building doesn’t need to be fancy or expensive. Even a 3-sided pole barn will work.

Also consider removing your rams from the flock and keeping them in a separate area. Schedule your breeding so that lambing occurs at a time convenient to your travel schedule and during milder weather.

ATTRA, the National Sustainable Agriculture Network Information Service has developed a video that shows how to age sheep and goats by looking at their teeth.

https://www.youtube.com/watch?v=gwpXzdE7h1I

New Fillable Registration Form Available

As part of BBSAI’s ongoing effort to improve member services, we have made the registration application interactive and fillable using the free Adobe Reader. Download the form at http://www.blackbellysheep.org/registration/. Then open the form in Adobe Reader. You can either print and mail the form or attach it to an email to BBSAI Registrar Eileen Breedlove along with your digital photos.

Coming soon: The ability to enter your registration information directly into BBSAI’s database and pay via PayPal.

New BBSAI Members

Ken Guth and Ann Brosseau  Grenville-Surlarouge, QC
Nathaniel and Miranda Collins  Milton, WV
Anthony and Austin Graf  Manchester, TN
Mary Leatheman  Newton, OR
Rhonda & Michael McNaughton  Olds, AB
Wayne Metheny  Kingston, TN
Amanda and Jason O’Brien  Lumby, BC
Tammi Redl  Lincoln, CA
Danny Williams  Wallisville, TX