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Building a Better Flock: A Practical Guide to Genetic Improvement for Sheep Producers

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Introduction

The journey to build a genetically superior flock is one of the most rewarding endeavors in livestock production. It requires planning, observation, patience, willingness to learn, and commitment to taking action. The dividends, however, are paid for years to come in reduced labor, lower input costs, higher productivity, and the deep satisfaction of seeing your careful planning manifest in a healthy, profitable, and resilient flock. Building a better flock is not a matter of chance, but of choice. This factsheet outlines a path from foundational concepts to advanced tools, but the core principle remains constant: consistent, goal-oriented selection is the single most powerful force in genetic improvement.

Why do Genetics Matter?

Genetic improvement is the most powerful, permanent, and cost-effective strategy for enhancing the efficiency, productivity and profitability of your operation. Genetic gains are cumulative and pass down from one generation to the next, building a flock inherently better suited to your land and your market.

The sheep industry is remarkably diverse. Whether your aim is easy-care lambs, faster-growing market animals, or parasite resistance, the path forward is built on the same genetic foundation. While goals differ, the fundamental principles of genetic improvement apply universally.

Genetic improvement is not merely about buying the most expensive ram at a livestock show or picking the best-looking ram lamb for your future ram. Indeed, genetic improvement is a systematic, long-term process of making informed breeding decisions based on clear goals, reliable data, and careful selection. It is about aligning your flock's genetics with your farm environment and market demands, turning your breeding program into the backbone of your operation's growth.

Steps for Genetic Improvement of Sheep

Step 1: Define your goals and choose your breed

The most sophisticated genetic plan is useless if the breed is fundamentally not a good fit for the production system, including natural and financial resources, labor availability, market access, and other factors. Do not fight nature or the marketplace - choose genetics that work with them. Your breed forms the foundation; all future selection builds upon this choice.

Know "Why": Before you look for animals, you should define success for your operation. Your goals are the compass for every breeding decision. Ask yourself what you are targeting and list desirable traits.

- Meat production
  - Key traits: growth rate, feed efficiency, carcass merit, and meat quality.
- Wool production
  - Key traits: fineness (micron), staple length, clean fleece yield, and consistency.
- Milk production
  - Key traits: milk yield, lactation persistence, and milk composition.

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- Maximized reproduction and mothering
  - Key traits: prolificacy (lambing rate), milk production, and strong maternal instincts.
- Adaptation and low input
  - Key traits: parasite resistance, heat tolerance, foraging ability, and hardiness.

You likely want a balance, but prioritizing the 2-3 most important traits can help you make faster progress towards your goals. An operation that prioritizes selling lamb meat direct-to-consumer has different genetic needs than one that sells wool to a specialty mill. The "ideal sheep" does not exist, but the right breed for your system does.

Breeds of Sheep

The classification of sheep breeds in the U.S. is commonly organized by primary production purpose: meat (terminal) breeds, fine wool breeds, long wool breeds, dual-purpose breeds, hair (shedding) breeds, or dairy breeds. The American Sheep Industry Association (ASI) and the National Sheep Improvement Program (NSIP) differ slightly in how they group breeds. The NSIP categorizes breeds into distinct evaluation types to compute Estimated Breeding Values (EBVs) appropriate for each production system. The standard NSIP categories are Terminal Sire, Maternal, Dual-Purpose, Wool, Hair, and Dairy breeds. The NSIP breed list can change as new breeds enroll or recording ceases. Below, each category is described along with brief details for representative breeds (Table 1).

Meat (Terminal) Breeds

Examples: Suffolk, Hampshire, Texel, Shropshire, Southdown and Oxford.

Raised primarily for their meat, these breeds are fast-growing, muscular, and lean. They are frequently used in crossbreeding systems to produce market lambs. In Arkansas, Suffolk and Hampshire are common breeds for 4-H/FAA projects and livestock shows. NSIP computes EBVs for traits such as weaning weight, post weaning weight, loineye area, and fat depth.

Wool Breeds

Examples: Rambouillet, Merino and Debouillet.

Breeds selected primarily for fleece weight, fiber diameter, staple length, and wool quality. NSIP provides EBVs for wool traits, with some breeds also evaluated for growth.

Dual-purpose Breeds

Examples: Corriedale, Targhee, Columbia and Coopworth.

They are adaptable to an extensive range of environments and produce both high-quality wool and viable market lambs. They are often fine-wool breeds prized for consistent fleeces and flocking instincts.

Maternal Breeds

Examples: Polypay and Dorset.

These breeds are known for their strong mothering abilities, high prolificacy (the ability to give birth to and raise multiple lambs), and superior milking qualities. The NSIP evaluates traits such as the number of lambs born, the number weaned, maternal weaning weight, and milk production.

Hair Sheep

Examples: Katahdin, Dorper, St. Croix, Royal White, and Barbados Blackbelly.

Unlike wool breeds, hair sheep naturally grow a hair coat or, in the case of composite breeds, shed their woolly winter coats in the spring, saving significant labor and shearing costs. The NSIP evaluates growth, maternal, and parasite resistance traits in this category. Hair sheep are considered a good option for low-input, pasture-based systems, brush control, and meat production (especially lamb/mutton for ethnic markets). St. Croix, Katahdin, and Barbados Blackbelly have innate parasite resistance, which is an important genetic trait in warm, humid climates.

Dairy Breeds

Examples: East Friesian and Lacaune.

Breeds specialized in high milk production, used in farmstead and commercial sheep dairying. NSIP evaluates milk yield, fat, protein, and somatic cell score (udder health).

Crossbred Sheep

Producers can unlock significant gains by exploring hybrid vigor (heterosis) to boost performance from crossing genetically diverse breeds. Hybrid vigor improves lamb vigor, survivability, and overall flock hardiness, even though it makes flock management more complex.

Another goal with crossbreeding is to combine specific traits from different breeds to maximize productivity, disease resistance, and environmental adaptability. For instance, using a parasite-resistant hair breed (e.g., Katahdin) as a maternal base and crossing with a muscular terminal sire (e.g., Dorper) to produce fast-growing market lambs that thrive in local conditions. We expect to gain on one side (growth, feed efficiency, carcass) and lose on the other side (mothering ability, hardiness).

Step 2: Selection of Replacement Ewes

Investing in superior replacement ewes is an impactful genetic decision. Selection should be a two-step process: first, cull rigorously for problems;

CATEGORY	PURPOSE	EXAMPLES	KEY TRAITS	NSIP EBV TRAITS EVALUATED
Hair	Meat production	Katahdin, Dorper, St. Croix	No shearing required. Adaptable to low-input, pasture-based systems.	Growth traits, maternal traits, and parasite resistance.
Terminal Sire	Meat production	Suffolk, Hampshire, Texel, Southdown	Fast-growing, muscular, and lean. Used primarily to produce market lambs with superior carcass traits.	Weaning weight, post-weaning weight, loin-eye area, fat depth.
Wool	Fine wool production	Rambouillet, Merino	Selected for fleece weight, fiber diameter, staple length, and overall wool quality.	Wool traits (fleece weight, fiber diameter, staple length).
Dual Purpose	Wool + meat	Corriedale, Targhee, Columbia, Coopworth	Adaptable to extensive range environments. Produce both wool and market lambs.	Typically includes parameters for wool and meat production.
Maternal	Flock foundation / Replacement females	Polypay, Dorset	Strong mothering abilities, high prolificacy, and excellent milking qualities.	Number of lambs born, number weaned, maternal weaning weight, milk production.
Dairy	Milk production	East Friesian, Lacaune	Specialized in high milk yields. Used in farmstead and commercial operations.	Milk yield, fat percentage, protein percentage, and somatic cell score.

Table 1. Sheep breed categories and key traits.

then, choose carefully for excellence. Use these tiers to make decisions as follows:

Cull criteria: These are functional traits essential for a productive, low-maintenance ewe. Any ewe failing here should be potentially marked for sale or culling, regardless of her lamb's performance.

- Open ewes: ewes that don't reproduce should be culled.
- Sound Feet and Legs: Must move freely without lameness. Splayed toes, persistent foot rot, or poor structure mean the ewe will not forage effectively or last in your flock.
- Good Udder Structure: At weaning, check for a well-attached, symmetrical udder with two functional teats. Cull ewes with hard spots, mastitis history, or large, pendulous, "pocket" udders prone to injury.
- Correct Jaw: A proper bite is critical for grazing efficiency. Ewes with a severe underbite ("parrot mouth") or overbite cannot maintain body condition and should not be bred.

Selection criteria: Identify your flock's future breeders.

COLOR	% OF FLOCK	CRITERIA	ACTION
Green	Top 20-30%	Raises twins, high weaning weight, excellent udder/feet, low FAMACHA© score	Retain their ewe lambs as replacements
Blue	Middle 50–60%	Productive, problem-free, meets basic cull criteria	Keep in flock
Red	Bottom 10–20%	Poor production, chronic issues (udder/feet), raises single light lamb, high parasite load	Remove them after weaning

Table 2: Ewe selection criteria.

Select replacements from ewes that excel in:

- A consistent history of twinning, easy lambing, and excellent mothering. An ewe that raises two vigorous lambs every year is ideal from a reproductive and economic perspective.
- Lambs that are consistently among the heaviest at weaning. The ewe is passing on genetics for both milk production and strong maternal care. The goal is to maximize pounds of lambs weaned.
- Maintaining condition on your pastures, showing minimal signs of parasite burden (e.g., FAMACHA© score/FEC), and handling summer heat without excessive stress. These are the genetics of resilience for your farm. For Arkansas and the rest of the Southeast, this is critical.

During weaning, you may use marking sprays in different colors to identify top, middle, and bottom categories, or to isolate top or elite animals, as shown in Table 2. This system makes your selection decisions concrete, visual, and easy to act upon, turning observation into annual genetic progress.

Selecting the right frame size—small, medium, or large—affects stocking rate, feed costs, maintenance requirements, and lamb growth potential, all of which directly influence productivity and profitability of the flock.

Step 3: Selecting and utilizing superior rams

Selecting the right ram is the single most impactful decision you make to improve genetics. A ram is not just another sheep; he is a genetic multiplier,

passing his genes to his offspring in numerous ewes. While a top ewe improves her offspring, a superior ram upgrades your flock in the first generation and for generations to come. Over the years, the choice between an average ram and a superior one is the difference between incremental gains and transformational improvement.

EBV TRAIT	WHAT IT PREDICTS	DESIRED VALUE	WHY IT MATTERS
Weaning Weight (WW)	Lamb weight at weaning compared to breed average	Higher (+) = better	Lambs from rams with higher WW EBV grow faster, improving market weights and profitability.
Maternal Milk (MM)	Daughter's milk production and the dam-side influence on lamb weaning weights.	Higher (+) = better	Daughters of rams with higher Milk EBV will produce consistently heavier lambs and improve flock productivity.
Worm Egg Count (WEC)	Represents the animal's inherent tendency to shed more or fewer worm eggs.	Lower (–) = better	Using sires with negative WEC reduces dewormer use, improves flock resilience, and supports sustainable parasite control programs.

Table 3: Key parameters for Estimated Breeding Values (EBVs) for ram selection.

A good-looking ram might catch your eye, but genetics is something that you cannot see. Reproduction, parasite resistance, and longevity are all characteristics that are not easily evaluated at a glance but significantly affect your bottom line. Relying on appearance alone is like buying a used truck based solely on its paint job. You must "look under the hood" with Estimated Breeding Values (EBV). These are statistical, data-driven predictors of an animal's genetic merit for specific traits, used to select superior breeding stock by filtering out environmental influences. For ram selection, key EBVs include growth traits (birth, weaning, and post-weaning weights) and carcass traits (ribeye muscle depth and fat depth). Reproduction traits (number of lambs born and weaned) and worm resistance are also critical for flock productivity. Selecting a balanced index of these traits ensures genetic progress toward healthier, more productive offspring.

The National Sheep Improvement Program (NSIP.org) is the primary source of dependable, scientifically calculated genetic data for U.S. sheep. The NSIP has complex mathematical models, standardizes data across flocks, and provides EBVs that allow you to make apples-to-apples comparisons between rams from different farms. Your mantra should be: "Buy NSIP-enrolled rams." It is the single best way to ensure your critical purchase is backed by data, not just promises.

The paramount challenge for the Southern U.S.: a parasite-resistant flock. Multi-trait selection combines two or more traits for genetic improvement, weighing each according to its economic importance, and is highly recommended when pursuing genetic gain. Internal parasites, particularly the barber pole worm (*Haemonchus contortus*), remain the single greatest threat to flock health and profitability in the southern U.S. Relying solely on dewormers is a failing strategy due to widespread anthelmintic resistance. The sustainable solution includes genetic selection for resistance and resilience, but it must be done with the right genetic tools. The most effective method combines:

- FAMACHA© Scores: A practical, on-farm tool for selectively deworming sheep based on anemia levels. Culling those that repeatedly require treatment and keeping the ones that do not will increase parasite resilience.
- Fecal Egg Counting (FEC): The gold standard for identifying genetically resistant animals that naturally have lower worm burden and shed fewer worm eggs, reducing pasture contamination and treatment needs.

We need to consider the physiological stage and production status when interpreting results. An ewe that does not reproduce probably will show a better body condition, FAMACHA© score, and lower FEC than an ewe nursing twins, not because she is genetically more resistant, but because she faces lower physiological stress. Therefore, health, reproduction and performance are all important factors in our breeding program. By using EBV for FEC (worm egg count, WEC), which statistically accounts for environmental and production-state effects, you identify the animals that carry genuine genetic merit for parasite resistance while performing under commercial conditions.

By selecting ewes and rams with low FAMACHA© scores and low FEC, you build a flock that requires fewer chemical inputs, maintains better condition, and produces more in the face of parasitic challenge. Consequently, it is not just a health management strategy; it is a genetic foundation for economic and environmental sustainability in our region. Moreover, parasite resistance should be combined with other economically important traits, such as mothering ability, high prolificacy, growth performance, and carcass traits.

Genetics is something that we cannot see: These NSIP Katahdin rams have different EBVs for several important traits such as parasite resistance, growth, reproductive and maternal traits. EBV is used to predict genetic merit.

Where to Find Quality Rams

- NSIP Breeders and NSIP Sales: Seek out breeders who actively participate in the NSIP. Their sale listings will include EBVs, giving you the power to select as per your specific priorities. It is advised to select breeders with production systems similar to yours.
- Centralized Ram Tests: Rams are fed and managed under equal conditions, generating relevant data such as growth, feed efficiency, carcass evaluation (ultrasound), and parasite resistance. Rams are managed identically, stripping away environmental differences, so performance differences reflect true genetic merit. However, the genotype × environment interaction is worth consideration. The results achieved in the test environment may differ significantly from those in the specific conditions of your farm. You must compare the test production system, including nutrition plan, stocking rate, management, and health protocols, with your own to judge how relevant the data will be.
- Sanctioned Breed Association Sales: Some state associations host premier sales where elite animals are sold, not specifically targeting the showring.

Management of ram

A superior ram is useless if it is not breeding or managed properly. A breeding soundness exam (BSE) is recommended before the breeding season. A BSE is a comprehensive evaluation of a ram's potential to mate with and impregnate ewes during a breeding season successfully. It is ideally performed 6–8 weeks before the breeding season to allow time for recovery from temporary issues or to find a replacement if the ram fails.

- Ram-to-ewe ratio: A general rule is one mature ram per 35-50 ewes. For ram lambs, use one per 15-25 ewes. Use a "marking harness" to track reproductive activity and estimate breeding date to monitor gestation, which is helpful for planning management activities, such as pregnancy checks and adequate nutrition programs. Also, ewes that get bred at the beginning of the breeding season are more fertile, and this should be considered in your selection program.
- Biosecurity is non-negotiable: Never introduce a new ram directly to your flock. Isolate him for 15-30 days, following the recommendation of your veterinarian. During this time, perform health checks/tests (e.g., Ovine Progressive Pneumonia, Caseous Lymphadenitis, and Johne's disease) and follow protocols as directed by your veterinarian.
- Body Condition Scoring (BCS): Rams must be in optimal condition (BCS 3.5-4.0) at the start of breeding. A thin ram may have a low libido and poor semen quality. Conversely, an obese ram may have a low libido and be prone to heat stress. Manage their nutrition year-round, not just before turning out.

Step 4: The power of record keeping: You cannot improve what you do not measure

Record keeping is the feedback loop that makes genetic improvement a precise science, not a guessing game. It tells you whom to keep, whom to sell, and where your flock's true strengths and weaknesses lie. Start simple, stay consistent, and let your own data be your most trusted advisor. But remember that genetic progress is slow and cumulative. The gains you are building today, through careful selection and culling, may not fully reveal themselves for a generation or two. So, patience is essential. Trust the trend your records show, even when the year-to-year changes feel small, because those small, steady improvements are what lead to a better, more profitable flock over time.

Genetics provides a blueprint, but records are your construction log. Without them, you are building in the dark. Reliable, simple records transform your operation from a collection of sheep into a managed business where every ewe earns her keep. You do not need a complex system to begin. Focus on three core documents that capture the most critical events:

1. Lambing record: For every ewe, note:
   - Ewe ID
   - Lambing Date
   - Number Born (lambs on the ground)
   - Number Raised (lambs at weaning)
   - Lamb IDs (link lambs to their dam)
   - Reproductive problems (abortion, dystocia, prolapses)
   - Health issues (lameness, parasites, mastitis)

This single sheet reveals your most profitable ewes—the ones who consistently give you more lambs on the ground and more pounds at the scale. It also instantly flags chronic problems like mastitis or poor mothering.

2. Weaning weights: Weigh every lamb on the same day, on the same scale, and adjust for age (e.g., 60, 90, 120-day weights) based on the average daily gain. Do not just get a total pen weight. Weaning weight is the direct result of a lamb's genetic growth potential and its mother's milk production. It is the ultimate combined scorecard for your ram and ewe selection decisions.

3. Health problems/treatments: A simple log of animal ID, date, feed, drug used, dosage, and withdrawal time. It ensures food safety, tracks treatment efficacy, and critically helps you identify susceptible animals. The ewe that always needs deworming or the lamb that is constantly sick is sending you a red flag.

Raw numbers are just ink on paper. Their true value is revealed when you use them to make pivotal management decisions. Sort your records to identify

animals with good reproductive, health, and performance indexes. For instance, at weaning, identify ewes that wean heavy lambs, have frequently lamb twins, and have no reproductive or health problems. Retaining their ewe lambs as replacements and breeding them to your best ram is the best strategy to improve your results. Ultimately, use their performance data to market breeding stock.

Records also provide an objective basis for culling by identifying ewes that are unproductive, unhealthy, raise single light lambs, or require extra care. They are consuming resources that could go to your more productive animals. Set firm benchmarks such as "ewes should wean at least 50% of their own body weight in lambs" or "wean lambs in the top 70% of the flock" and stick to them. Culling underperformers is how you raise the average of your entire flock.

Choose a method you will actually use and maintain consistency (Table 4).

- A weatherproof notebook in the barn or a clipboard with pre-printed forms is a perfect, low-cost start. It is always there, needs no battery, and is simple for anyone to use.
- A computer spreadsheet (like Excel or Google Sheets) is a powerful next step. You can easily sort, filter, and calculate averages. Create a tab for lambing, a tab for weights, and watch your flock's story emerge.
- Dedicated livestock software takes record-keeping to the next level. They can automatically generate reports and calculate adjusted weights. It is ideal for larger flocks or serious seedstock producers.

Advanced Tools and Considerations

For sheep producers ready to accelerate their genetic progress and build flocks that are truly adapted to their unique challenges, a suite of advanced tools is now available. These technologies move beyond simple observation, allowing for precise, data-driven selection that can compound gains for generations.

METHOD	PROS	CONS	BEST FOR
Notebook/ Clipboard	Low cost, always available, simple to use	Manual analysis, harder to track trends	Small flocks, starting out
Spreadsheet (Excel/Sheets)	Easy sorting, filtering, and calculations	Requires basic computer skills	Intermediate flocks, data-minded producers
Livestock Software	Automated reports, NSIP integration, advanced tracking	Cost, learning curve	Larger flocks, seedstock producers

Table 4: Record-keeping methods comparison

Genomic testing: Unveiling the genetic blueprint

Think of genomic testing as a powerful decoder for your sheep's DNA. By analyzing a simple tissue sample or blood card, these tests examine thousands of genetic markers across the genome. This allows producers to:

- Predict invaluable traits: For traits that are difficult or expensive to measure directly, such as genetic resistance to internal parasites (barber pole worm) or feed efficiency, genomic tests can provide early-life predictions. It lets you select replacement lambs with superior genetic merit before they ever face a pasture challenge.
- Accelerate improvement: Instead of waiting years to see a ram's progeny performance, Genomic-Enhanced Estimated Breeding Values (GEBVs) provide more accurate estimates at birth. It drastically shortens the generational interval for hard-to-measure traits.
- Ensure essential genotypes: A foundational use is scrapie genotype testing. Selecting and breeding for AA and RR at codons 136 and 171, respectively, protects against this fatal disease, a critical step for any breeding operation.

Assisted reproductive technologies (ARTs): The genetic leap

- Estrus synchronization and artificial insemination (AI) are no longer just for large, commercial operations. They are practical tools for the progressive sheep producer to make rapid, transformative genetic leaps (Table 5).
- Introduce Elite Genetics: AI allows you to bypass the need to purchase and maintain an expensive, high-performing flock sire. You can instead use semen from nationally or internationally recognized rams whose proven genetics for growth, carcass quality, or parasite resistance would otherwise be inaccessible.
- Create Uniform Lamb Crops: Synchronizing your ewes to breed and lamb in a tight window simplifies management, creates more uniform groups of lambs for the market, and maximizes the use of your best genetics across your entire flock in a single season. It can be done using multiple techniques, including male effect, nutritional, and hormonal treatment strategies. Due to the use of laparoscopic techniques for AI and the need for qualified personnel, estrus synchronization protocols are typically used.
- Embryo Transfer (ET) and In-vitro fertilization (IVF): Embryo transfer in sheep is a reproductive technology used to produce more offspring from genetically valuable females. The process involves several key steps, from synchronizing the animals' cycles to carefully transferring

TOOL	PURPOSE	BENEFITS
Genomic Testing	DNA analysis for trait prediction	Early selection for hard-to-measure traits, scrapie resistance.
Artificial Insemination (AI)	Use semen from elite rams	Access superior genetics without buying and maintaining expensive sires.
Embryo transfer (ET)	Directly transfer embryos into recipient ewes	Get more lambs from the same ewe as compared to conventional breeding or mating. Embryos are implanted into recipient ewes, preserving the genetics of the original parents.
In vitro fertilization (IVF)	Use both semen and ova from elite rams and ewes	Accelerated genetic gain, optimized breeding, and improved reproductive efficiency. It allows for the efficient creation of embryos from high-value donors.

Table 5: Advanced genetic tools for sheep producers

embryos into the recipient ewes. In-Vitro Fertilization (IVF) in sheep is the next step in advanced reproductive technologies. While embryo transfer involves collecting and transferring an embryo that was conceived inside the donor ewe, IVF refers to conceiving the embryo in a laboratory dish. In sheep, this process is formally known as In Vitro Embryo Production (IVEP). It's a powerful but complex tool that offers different advantages and opportunities.

Putting it all Together: A 5-year Genetic Plan for Your Farm

The most advanced tools are only effective with a clear, patient, and executable plan. Genetic improvement is a marathon, not a sprint. The following five-year roadmap is designed to help producers build momentum, see tangible results, and create lasting change without feeling overwhelmed, as shown in Figure 1.

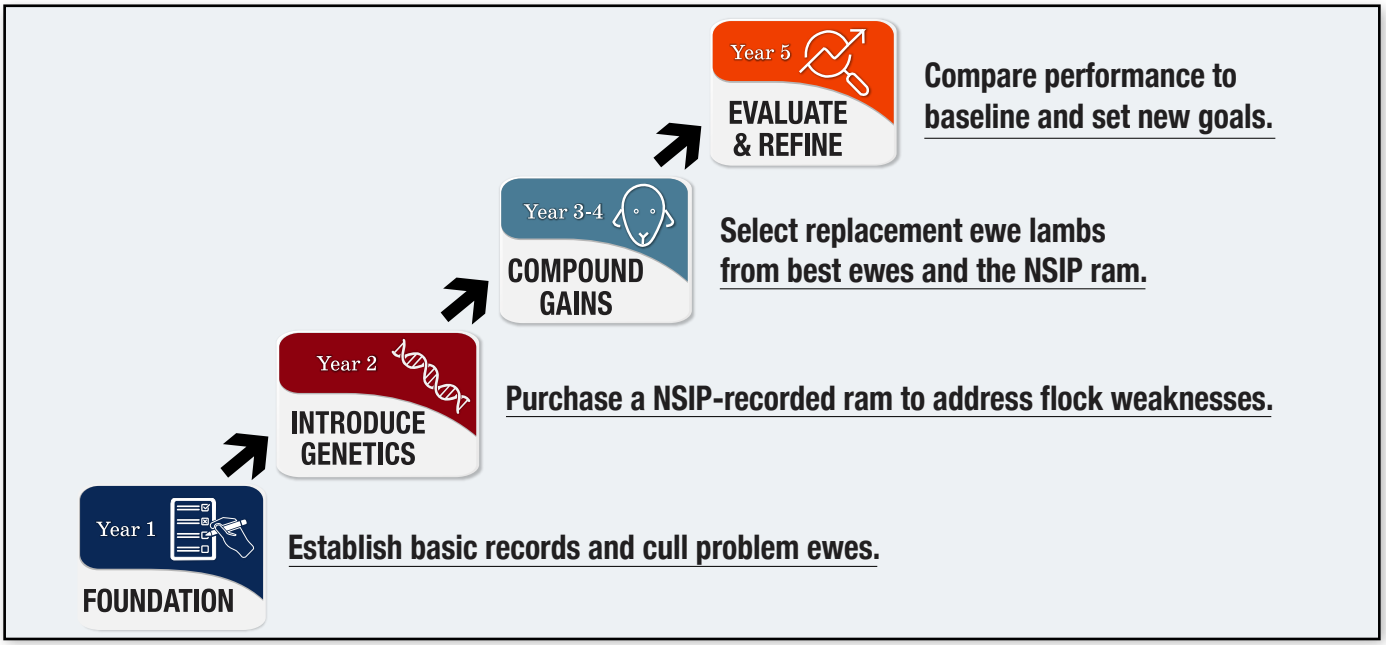
Year 1: The foundational year

- **Define your "better flock."** Hold a family or business meeting. Are your goals heavier weaning weights, fewer dewormer treatments, more twins, or all the above? Write down 2-3 primary goals.
- **Start simple records.** Remember, you cannot improve what you do not measure. Begin with essential information: ewe ID, birth type (single/twin), weaning weight of her lamb(s), lambing issues, and any health treatments (especially FAMACHA© scores and dewormer use).
- **Cull the obvious.** Be ruthless with problem ewes. It includes open ewes, those with chronic mastitis, those with bad feet, or those that consistently require deworming while their flockmates do not. It immediately improves the average quality of your flock and reduces feed costs.

Year 2: Introduce superior genetics

- **Invest in Your Genetic Engine - The Ram.** Using your Year 1 records, identify your flock's biggest weakness (e.g., low weaning weights, parasite burden). Purchase an NSIP ram from breeders who are in a similar environment to yours with strong, accented EBVs that specifically target that weakness and help you achieve your goals. This single decision introduces a powerful, proven genetic advantage across your entire lamb crop.

Figure 1: Roadmap for genetic improvement in a sheep flock.



Year 3-4: Compound your gains

- Select your future flock. The lambs on the ground are now the result of your best ewes and your superior NSIP ram. It is your genetic payoff. Rigorously select replacement ewe lambs from these matings, using your records. Choose twins from ewes with good udders, low parasite scores, and that have weaned a heavy lamb. You are now stacking genetic advantages.

Year 5: Evaluate and refine

- Measure your progress. Compare your current flock performance to your Year 1 baseline. Analyze weaning weight averages, lambing percentage, and dewormer usage. The critical benchmark: Your homegrown, genetically selected ewes should be clearly outperforming the original ewes you started with. They should be more productive, more resilient, and more aligned with your goals.
- Set new goals. With a solid foundation, consider your next genetic step. Can you now use genomic testing to refine selection? Is it time to use AI to introduce an elite sire for a specific trait? Your five-year cycle begins anew, but from a much higher genetic plane.

Patience is key: The power of incremental, permanent change

The most important tool in your genetic toolkit is patience. Genetic change is incremental; you are shifting the average of your entire flock by a few percentage points each year. Unlike management changes, which have an immediate but temporary effect, genetic improvement is permanent and cumulative. The superior genetics you introduce today will ripple through your flock for generations, building a legacy of productivity and sustainability for your farm. Stay the course—your "better flock" is being built, one careful selection at a time.

Conclusion and Local Resources

Technology is a powerful accelerator, but it cannot replace the producer's clear vision and commitment to making deliberate decisions, generation after generation. The most sophisticated EBV is only valuable if you use it to select the rams that will move your flock toward your defined goals.

Every farm is unique. To tailor these principles to your specific operation, soil, pastures, facilities, equipment, and market, we strongly encourage you to contact your local County Extension Agent. They are your direct link to research-based information and can provide on-farm support to help you develop and execute your genetic plan.

You are not alone in this effort. The University of Arkansas System Division of Agriculture provides dedicated support through the Small Ruminant Extension Program, offering education opportunities and resources.

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