

## 1: Sheep Selecting breeding stock

*Starting with and selecting the right sheep will go a long way towards ensuring a successful sheep enterprise, no matter what the production emphasis is or where the farm or ranch is located. Breed selection is discussed in the Breed Selection chapter.*

**Hand mating** In this system the females are allowed to mate one by one. This system reduces the risk of injuries to the animals. It is beneficial when mating older male with a younger female. It also improves the breeding efficiency of male, resulting in an increased number of females that can be bred in shorter period of time. Males are turned in to the flock only during the night time and separated during day time. Males are also given enough rest and they can be fed properly. The male may lose it most of its body reserves in chasing the females and they may lose their body conditions.

**Artificial insemination** Artificial insemination offer the best means of distributing germplasm from nucleus breeding flock to many small flocks within each eco system. Fresh as well as frozen semen is used. The speculum method of insemination is used for ewes and does. Cervical insemination is generally followed for better conception rate.

**Care of pregnant animals** The pregnant animals ewes should not be handled frequently. Vigilant eye should be kept for dystocia or difficult birth. Maiden ewes in poor condition or small-framed ewes mated to big rams will generally have difficulty in parturition and will have to be assisted. If no progress in kidding, better call for the veterinary obstetrician for physical manipulation and surgical need. After kidding the doe naturally licks the kids which she would invariably do and remove the membranous cover and she may even eat it. Allow to lick the kids, which helps in early drying, sensitizing and stimulating the kid and thereby attracts the new born with motherly instinct towards udder. If she does not do so better remove the membranous attachment from over the face, nostrils, eyes, mouth as well as the body parts. Do not leave the navel cord as such in hanging position lest it may attract the crows in open causing bleeding injury to the navel. Allow the kids to suckle the mother within 20 minutes of birth so that the kids get Vit-A-rich colostrum and immunoglobulin essential for the kids. Give the doe warm cereal meal-the gruel drink either as such or mixed with one to two tablespoonful. In case of heavy milker if not sucked by the kid she should be milked out soon to the extent of relieving her udder pressure. Elite dairy goat of high production potential should be milked from the third day of kidding. The first 1 to 2 hrs after birth is the vital period for establishment of bond between the new born and the mother. Hence the dam should be kept in a calm place without disturbance from stray dogs and other animals. Allow newborn lambs 1 kids to be with their mother all the 24 hrs for first week or so.

**General breeding management** The male female ratio is 1: Young males can be put in to experienced older ewes and older rams to younger ewes will help in better mating. Inbreeding should be avoided. The males should be replaced or exchanged once in two years to avoid inbreeding. Breeding ewe of indigenous breeds should be 18to 24 months depending upon their body condition. Breeding too young ewes result in more weakling and thus results in higher lamb loss. Body weight of ewe at breeding should normally be less than the adult body weight of that breed. Oestrous detection of all female goats above 1 year should be done either with approned or vasectomized buck both in morning or evening during breeding season. In order to synchronize them improved hormonal technology may be used or buck may be in a partitioned corral of woven-wire net so that the does and the buck may have full view of each other. This may be done a week or two before or during the breeding season. If 2 services at an interval of 8 to 12 hrs is practised, improvement in conception may be achieved. Goats which do not return to oestrus after 2 cycles are considered as pregnant and should be separated from the dry, non pregnant flock. They should be kept in a group of not more than 15 to 20 does to avoid infighting. If they have no kidding for complete one, year they should be removed from flock. This will save the kids from cold susceptibility and resultant pneumonic death during winter. Avoid starvation of goat since even two days starvation period early in pregnancy can cause a high percentage of shed embryos to be absorbed.

**Managemental methods to optimize breeding** Oestrous stimulation It is the practice of stimulating and synchronizing breeding by putting vasectomized males with females about 10 days to 2 weeks prior to the beginning of breeding. As a result of this, large portion of the ewes will ovulate and conceive during the early part of the breeding season. After the

administration for 14 days the hormone is withdrawn. The animal comes to heat within 3 days. Administration of two intra muscular injections of Prostaglandin F2 alpha or its synthetic analogues 10 mg each at an interval of 10 days bring all the animals in heat within 72 to 96 hrs.

### 2: Sheep - Wikipedia

*Selection and Breeding. Since life began, animals best adapted to their environment have survived and produced the largest number of offspring. For example, most breeds of sheep that originated in the British Isles survived only if they were born in the spring when the temperature was mild and feed was available.*

History of the domestic sheep The exact line of descent between domestic sheep and their wild ancestors is unclear. Domestic sheep differ from their wild relatives and ancestors in several respects, having become uniquely neotenic as a result of selective breeding by humans. Depending on breed, domestic sheep may have no horns at all i. Most horned breeds have a single pair, but a few breeds may have several. Wild sheep are largely variations of brown hues, and variation within species is extremely limited. Colors of domestic sheep range from pure white to dark chocolate brown, and even spotted or piebald. However, colored sheep do appear in many modern breeds, and may even appear as a recessive trait in white flocks. There is variation of wool type and quality even among members of the same flock, so wool classing is a step in the commercial processing of the fibre. Their rate of growth and mature weight is a heritable trait that is often selected for in breeding. As with other ruminants, the front teeth in the lower jaw bite against a hard, toothless pad in the upper jaw. These are used to pick off vegetation, then the rear teeth grind it before it is swallowed. There are eight lower front teeth in ruminants, but there is some disagreement as to whether these are eight incisors , or six incisors and two incisor-shaped canines. This means that the dental formula for sheep is either 0. In the first few years of life one can calculate the age of sheep from their front teeth, as a pair of milk teeth is replaced by larger adult teeth each year, the full set of eight adult front teeth being complete at about four years of age. The front teeth are then gradually lost as sheep age, making it harder for them to feed and hindering the health and productivity of the animal. For this reason, domestic sheep on normal pasture begin to slowly decline from four years on, and the life expectancy of a sheep is 10 to 12 years, though some sheep may live as long as 20 years. A few breeds tend to have considerable wool on the face; for some individuals of these breeds, peripheral vision may be greatly reduced by "wool blindness", unless recently shorn about the face. In general, sheep have a tendency to move out of the dark and into well-lit areas, [21] and prefer to move uphill when disturbed. Sheep also have an excellent sense of smell, and, like all species of their genus, have scent glands just in front of the eyes, and interdigitally on the feet. The purpose of these glands is uncertain, [22] but those on the face may be used in breeding behaviors. However, they are separate species, so hybrids rarely occur, and are always infertile. A hybrid of a ewe and a buck a male goat is called a sheep-goat hybrid only a single such animal has been confirmed , and is not to be confused with the sheep-goat chimera , though both are known as geep. Visual differences between sheep and goats include the beard of goats and divided upper lip of sheep. Sheep tails also hang down, even when short or docked , while the short tails of goats are held upwards. Also, sheep breeds are often naturally polled either in both sexes or just in the female , while naturally polled goats are rare though many are polled artificially. Males of the two species differ in that buck goats acquire a unique and strong odor during the rut , whereas rams do not. List of sheep breeds The domestic sheep is a multi-purpose animal, and the more than breeds now in existence were created to serve these diverse purposes. Other features used when classifying sheep include face color generally white or black , tail length, presence or lack of horns, and the topography for which the breed has been developed. This last point is especially stressed in the UK, where breeds are described as either upland hill or mountain or lowland breeds. The Barbados Blackbelly is a hair sheep breed of Caribbean origin. Breeds are often categorized by the type of their wool. Fine wool breeds are those that have wool of great crimp and density, which are preferred for textiles. Most of these were derived from Merino sheep, and the breed continues to dominate the world sheep industry. Downs breeds have wool between the extremes, and are typically fast-growing meat and ram breeds with dark faces. Long wool breeds are the largest of sheep, with long wool and a slow rate of growth. Long wool sheep are most valued for crossbreeding to improve the attributes of other sheep types. Coarse or carpet wool sheep are those with a medium to long length wool of characteristic coarseness. Breeds traditionally used for carpet wool show great variability, but the chief requirement is a wool that will not break down under

heavy use as would that of the finer breeds. As the demand for carpet-quality wool declines, some breeders of this type of sheep are attempting to use a few of these traditional breeds for alternative purposes. Others have always been primarily meat-class sheep. Dual-purpose breeds that may primarily be meat or wool sheep are often used secondarily as milking animals, but there are a few breeds that are predominantly used for milking. These sheep produce a higher quantity of milk and have slightly longer lactation curves. Hair sheep are similar to the early domesticated sheep kept before woolly breeds were developed, and are raised for meat and pelts. Some modern breeds of hair sheep, such as the Dorper, result from crosses between wool and hair breeds. For meat and hide producers, hair sheep are cheaper to keep, as they do not need shearing. The Rare Breeds Survival Trust of the UK lists 22 native breeds as having only 3, registered animals each, and The Livestock Conservancy lists 14 as either "critical" or "threatened". Diet Sheep are exclusively herbivorous mammals. Most breeds prefer to graze on grass and other short roughage, avoiding the taller woody parts of plants that goats readily consume. When sheep graze, vegetation is chewed into a mass called a bolus, which is then passed into the rumen, via the reticulum. The rumen is a 5 to 10 liter organ in which feed is fermented. After the first three chambers, food moves into the abomasum for final digestion before processing by the intestines. The abomasum is the only one of the four chambers analogous to the human stomach, and is sometimes called the "true stomach". The ability to thrive solely on pasture even without hay varies with breed, but all sheep can survive on this diet. Feed provided to sheep must be specially formulated, as most cattle, poultry, pig, and even some goat feeds contain levels of copper that are lethal to sheep. Ideal pasture for sheep is not lawnlike grass, but an array of grasses, legumes and forbs. Common plants toxic to sheep are present in most of the world, and include but are not limited to cherry, some oaks and acorns, tomato, yew, rhubarb, potato, and rhododendron. With a much narrower face, sheep crop plants very close to the ground and can overgraze a pasture much faster than cattle. By disturbing the natural state of pasture, sheep and other livestock can pave the way for invasive plants. However, sheep also prefer to eat invasives such as cheatgrass, leafy spurge, kudzu and spotted knapweed over native species such as sagebrush, making grazing sheep effective for conservation grazing. Three trials demonstrated that grazing lambs were just as effective as herbicides in controlling winter weeds. Entomologists also compared grazing lambs to insecticides for insect control in winter alfalfa. In this trial, lambs provided insect control as effectively as insecticides. The dominance hierarchy of sheep and their natural inclination to follow a leader to new pastures were the pivotal factors in sheep being one of the first domesticated livestock species. Relationships in flocks tend to be closest among related sheep: Lambs learn the heft from ewes and if whole flocks are culled it must be retaught to the replacement animals. Cornered sheep may charge and butt, or threaten by hoof stamping and adopting an aggressive posture. This is particularly true for ewes with newborn lambs. This method of moving sheep works best with smaller flocks. Farmers exploit flocking behavior to keep sheep together on unfenced pastures such as hill farming, and to move them more easily. For this purpose shepherds may use herding dogs in this effort, with a highly bred herding ability. Sheep are food-oriented, and association of humans with regular feeding often results in sheep soliciting people for food. Dominant animals are inclined to be more aggressive with other sheep, and usually feed first at troughs. Despite these perceptions, a University of Illinois monograph on sheep reported their intelligence to be just below that of pigs, and on par with that of cattle. Sounds made by domestic sheep include bleats, grunts, rumbles and snorts. Bleating "baaing" is used mostly for contact communication, especially between dam and lambs, but also at times between other flock members. Apart from contact communication, bleating may signal distress, frustration or impatience; however, sheep are usually silent when in pain. Isolation commonly prompts bleating by sheep. A snort explosive exhalation through the nostrils may signal aggression or a warning, [59] [63] and is often elicited from startled sheep. In 60 Merinos, visual fields ranged from In addition to facial wool in some breeds, visual field limitations can include ears and in some breeds horns, [66] so the visual field can be extended by tilting the head. Sheep eyes exhibit very low hyperopia and little astigmatism. Such visual characteristics are likely to produce a well-focused retinal image of objects in both the middle and long distance. This constant monitoring is probably what keeps the sheep in a flock as they move along grazing. Sheep become stressed when isolated; this stress is reduced if they are provided with a mirror, indicating that the sight of other sheep reduces stress.

Touch and sight are also important in relation to specific plant characteristics, such as succulence and growth form. Domestic sheep reproduction The second of twins being born. Sheep follow a similar reproductive strategy to other herd animals. A group of ewes is generally mated by a single ram, who has either been chosen by a breeder or in feral populations has established dominance through physical contest with other rams. For example, Finnsheep ewe lambs may reach puberty as early as 3 to 4 months, and Merino ewes sometimes reach puberty at 18 to 20 months. Rams, especially unfamiliar ones, will also fight outside the breeding period to establish dominance; rams can kill one another if allowed to mix freely. By selectively breeding ewes that produce multiple offspring with higher birth weights for generations, sheep producers have inadvertently caused some domestic sheep to have difficulty lambing; balancing ease of lambing with high productivity is one of the dilemmas of sheep breeding. Lambs that either fail to nurse or are rejected by the ewe require help to survive, such as bottle-feeding or fostering by another ewe. Ear tags with numbers are attached, or ear marks are applied, for ease of later identification of sheep. Castration is performed on ram lambs not intended for breeding, although some shepherds choose to omit this for ethical, economic or practical reasons. Docking and castration are commonly done after 24 hours to avoid interference with maternal bonding and consumption of colostrum and are often done not later than one week after birth, to minimize pain, stress, recovery time and complications. Historically, shepherds often created remedies by experimentation on the farm. In some developed countries, including the United States, sheep lack the economic importance for drug companies to perform expensive clinical trials required to approve more than a relatively limited number of drugs for ovine use. The first is to ensure all sheep are healthy when purchased. Many buyers avoid outlets known to be clearing houses for animals culled from healthy flocks as either sick or simply inferior.

### 3: Sheep Breed Selection

*Selecting a breed of sheep According to some estimates, there are more than 1, breeds of sheep worldwide and more than 50 in the United States alone. More breeds are being introduced to the US all the time, often via imported semen.*

A Soay sheep lamb on the Scottish island of Hirta view more Credit: No one knows for sure when or how they got there, but Soay sheep *Ovis aries* arrived on the isolated, wind-swept Scottish island of Soay sometime during the Bronze Age, thousands of years ago. In the s, a flock was relocated to Hirta, an adjacent island in the St. Kilda archipelago, after villagers evacuated to the mainland. Since then, the sheep have been left mostly to their own devices, save for ongoing encounters with scientists keen to test a range of evolutionary hypotheses on this unique population. Alastair Wilson, Loeske Kruuk, and colleagues took advantage of a year study of birth weight in Soay sheep--which covered nine generations and significant climatic fluctuations--to examine the impact of environmental quality on the strength of selection and the amount of genetic variation associated with a fitness-related trait. They now report--in the open-access journal *PLoS Biology*--that the extent to which birth weight is heritable--that is, the variance caused by maternal genetic effects--increased along with environmental quality. Evolution should occur when selection acts on a trait, such as birth weight, that has a genetic basis. Birth weight is closely linked to juvenile mortality, with larger lambs having higher survival and higher fitness. The first six months of life are critical; lamb deaths during this crucial window account for nearly a quarter of all deaths. Even though birth weight has all the raw materials for evolution--a positive correlation between birth weight and survival, and a heritable basis for variation, attributed to maternal genetic effects--previous studies found no evidence for evolution of the trait. Since annual birth weight had not increased over the 20 years, the researchers hypothesized that a variable environment could limit its micro-evolution by limiting heritability, selection, or both. To study the micro-evolutionary dynamics of a wild population, they adapted a theoretical model long used by animal breeders. Quantitative genetic models measure the genetic contribution which typically involves multiple genes to variation in a given trait, such as milk production in dairy cows. With these models, plant and animal breeders maintain or develop desired traits by predicting an evolutionary path based on the strength of selection and the amount of genetic variance underlying the trait. To overcome these limitations, the researchers incorporated a statistical tool called random regression analysis. With this approach, they could not only model the effects of environmental variation on selection and heritability but also maximize the statistical power of their dataset. This is a particularly effective technique for natural populations, for which the data are inevitably limited. It also allowed the researchers to model the genetic variance underlying lamb birth weight as a function of environmental quality poor if lamb survival was low, good if survival was high , creating a more realistic evolutionary picture. The most powerful modeling result showed that the extent to which birth weight is heritable--that is, the variance caused by maternal genetic effects--increased along with environmental quality. But when Wilson et al. Fitness increased with birth weight, and with environmental quality, but the positive relationship between fitness and birth weight--indicating the strength of selection--became weaker in better environments. Environmental quality shapes the trajectories for both genetic variance and the strength of selection. These results emphasize the importance of using biologically realistic models to predict the evolution of traits in wild populations--an important component of genetic restoration for endangered species, for example. They also confirm the value of long-term studies on wild populations to better detect patterns of selection and genetic variation in the natural world. *PLoS Biol* 4 7:

### 4: Breeding Management of Sheep and Goat

*Selection of Sheep This lesson addresses the selection process when managing a sheep operation. Within Missouri and throughout the Midwest, producers can choose many different breeds.*

The frame size is used to predict the size of the lamb when finished. Frame size includes the body length and capacity of the lamb. You should try to avoid very small and very large frame sized lambs. Average to large frame score lambs should be selected to see economical gains. Lambs are typically slaughtered around pounds, so something else to think about when deciding on a lamb is to make sure you can get them to their target weight in time for the fair. Lambs usually gain 0. The lambs need to be at least two months of age at fair time. Ewes tend to be more expensive than wethers. Are you buying a private treaty lamb, which means you are buying straight from the producer, or are you going to an auction? If you are going to an auction, generally the lambs are in racks. You should choose ones you are interested in and ask the producer to pull them out so you can make a complete evaluation of them. There are a few traits on the lamb that you should evaluate before the purchase. Muscling, growth traits, eye appeal, and structural soundness are just some of the major features you should base your decision on. The front end plays an important role in the eye appeal of the lamb. It should be smooth and possess a large amount of length. The head should have a youthful appearance. The neck should be nice and long and blend smoothly into the shoulder. A shorter neck usually means a thicker neck. The shoulder should be higher than the rump, giving you a lamb that is straight lined, balanced, and flat topped. The flank design should also appear long and smooth; lambs with bulky front ends throw off their overall appearance. Make sure that the lamb is fairly straight in the hip. If it is too straight, then move on to another lamb. Choose a lamb that has an angular shape coming out of the shoulders towards the hindsaddle. The lamb should have an overall triangular shape. A raised edge on the outer edges of the loin is desirable. Leg conformation is also important. When you look at the lamb from a front view you want to see nice, straight legs, not ones that bow out or where the knees knock together. The toes should also point forwards, not toed out or in. From the rear view, again you are looking for straightness. Bowlegged and cow-hocked hocks come together legs are undesirable. The side view also tells you something about the conformation. You should be able to draw an imaginary line from the rump of the sheep to the ground and the hind leg should line up with it. This will tell you if the lamb is sickled hocked or post-legged. Handling lambs is an important part of evaluating them for purchase. You should feel over the rack and across the loin. If the loin has a soft feel, which is undesirable, move on to another lamb. Look for a loin that has a hard, firm feel and braces easily. There is no perfect lamb, so remember to look for the lamb that best combines the positive traits into one package. Never pick an animal based on one trait alone, look for the one that fits your tastes, budget, and the youth that will be exhibiting the animal. Most of all, remember to enjoy exhibiting your lamb and have fun!!

### 5: Sheep Production and Management: selection and breeding

*Sheep Selection LIVESTOCK & POULTRY* In sheep production, breeding stock selection is the basis for any flock improvement. Deciding which animals to retain can be challenging, but the diligence of the decision is critical to the.

Sheep Production Sheep Production Guide - A sheep enterprise can be ranch size or it can fit into a few acres. It can be a full-time occupation, but it also is well suited for diversified and part-time farmers, or it can be expertly handled by the spouse or younger members of the farm family. This guide outlines management practices to help successfully raise sheep. Sustainable Sheep Production - This publication introduces concerns and practices specifically related to sustainable sheep production. Topics covered include breed selection, controlled grazing, pasture lambing, alternative health management, and innovative marketing of meat and wool products. A list of further resources is also included. Raising Dairy Sheep - The sale of sheep milk or milk products is often more profitable than selling only lamb or wool. This publication explores the dairy sheep business and helps producers decide whether it is a viable option for their farms. Regulations governing the industry are discussed. The publication also addresses production issues, animal health, stock selection, and nutrition issues surrounding dairy sheep. References and resources follow the narrative. Make the decision to remove the lamb from the ewe as soon as possible after birth. Body Condition Scoring - Throughout the production cycle, sheep producers must know whether or not their sheep are in condition too thin, too fat, or just right for the stage of production: Nutrition of Lambing - Do you have your ewes nutritionally prepared for lambing and lactation? Early planning and implementation of a nutrition program for your ewes can decrease problems later. Sheep Breed Information - Selection for wool type, flocking instinct and other economically important traits over the centuries has resulted in more than distinct breeds of sheep occurring worldwide. Modern breeding schemes have also resulted in an increasing number of composite or synthetic breeds which are the result of a crossing of two or more established breeds. Tube Feeding Neo Natal Small Ruminants - This publication gives a complete overview of the topic of tube feeding neonatal lambs and kids. Relevant anatomy, indications, and techniques are presented. Photographs illustrate the techniques discussed. Information about colostrum, biosecurity, sanitation, and passive transfer of immunity is included as well. Because feed costs account for a large cost of production on sheep farms, it is important that producers consider nutrition management a top priority. Internal Parasites in Sheep and Goats - Parasites commonly found in sheep and goats can be divided into two general categories: Nutritional Management of the Sheep Flock - Feed for the ewe flock represents the largest production cost in a sheep enterprise. This means over-nutrition and using costly feedstuffs and ingredients is expensive and undesirable. At the same time, under-nutrition is also expensive due to lost productivity. Therefore, it is important to develop a nutritional management program for your flock that optimizes production while minimizing feed costs. Grades and Lengths of Wool - Wool is an expensive fiber to produce and process; consequently, it must be economically applicable to the product demanded by the consumer. Other Sheep Resources Maryland Small Ruminant Information - Information portal for sheep and goat producers and anyone else interested in small ruminants. Sheep Resources - Sheep resources, such as genetics, meats, reproduction, and more. American Sheep Industry Association - ASI is the national organization representing the interests of more than 82, sheep producers located throughout the United States. From East to West, farm flocks to range operations, ASI works to represent the interests of all producers. Raising and Training a Livestock-Guarding Dog - Guarding dogs are useful tools for reducing livestock losses to predators. Success depends on the inborn abilities of the dog and on proper training. This publication provides suggestions for bringing out the best performance in your livestock-guarding dog.

### 6: Natural selection in island sheep | EurekAlert! Science News

*Reduction of faecal worm egg count, worm numbers and worm fecundity in sheep selected for worm resistance following artificial infection with *Teladorsagia circumcincta* and *Trichostrongylus colubriformis*.*

**Home Selection and Breeding** Since life began, animals best adapted to their environment have survived and produced the largest number of offspring. For example, most breeds of sheep that originated in the British Isles survived only if they were born in the spring when the temperature was mild and feed was available. That is natural selection. Selection should be a part of all breeding sheep production enterprises. It is effective for almost all the important economic traits in sheep. No selection program, however, can improve all these economically important traits at once. Generally, the more traits involved in selection, the less improvement will result for a single trait. The first step in any selection program is to identify the traits of greatest economic importance. They may be growth rate, carcass merit, fleece traits, or reproductive efficiency. The improvement that can be made depends on: Accurate measurement of the trait. Complete records on the flock. The amount of selection pressure applied. The amount of variation of the trait or different traits among individuals within the flock. If the sheep do not vary genetically, then no improvement can be made. If they vary greatly, then improvement will be rapid when producers select only the individuals that excel in the expression of important traits. The heritability of the trait. Variation in any economic trait is caused by genetic differences and environmental differences. Variation that results from differences in heredity is broadly defined as heritability. Researchers have estimated the heritability the ability to "pass on" traits to offspring of the economically important traits table 1. Generally, if the heritability estimate is less than 20 percent, progress is slow. A heritability estimate of 20 to 40 percent is considered medium. A heritability estimate greater than 40 percent is high. Purebred breeders should be committed to improving the economically important traits of their breed. Their breed serves as a source of genetic material for crossbreeding and for improving the industry. On the other hand, commercial sheep producers might find it more profitable to crossbreed. Some economically important traits that can be improved only slowly within a breed can be improved more rapidly with effective crossbreeding. An example is rate of reproduction. By most estimates, the heritability of reproductive traits is low. However, hybrid vigor expression of a trait above the average of the dam and sire for that trait exists for rate of reproduction. Generally, crossbred ewes exhibit a higher reproduction rate, produce more milk, and their lambs are stronger at birth. Heritability of traits in sheep Trait.

### 7: Great selection of dishes - Review of Black Sheep Pub, Ormond Beach, FL - TripAdvisor

*SELECTION OF MARKET CLUB LAMBS. By: Stephanie Raney, Gabriella Henderson, and Chris Holliday. The lamb project in 4-H and FFA has grown in the Midwest. This site is designed to help young people make educated decisions about their project.*

There are many things that go into selecting a stud buck. First you want to look at the operation you want to run, do you want to be a purebred operation or do you want to be a commercial operation? This plays a vital role in determining what ram you want to choose. If you want to be a purebred operation your choices are narrowed to the breed you are raising. If you want to raise commercial lambs, you can look at your ewe flock and determine the most productive cross between all breeds. This will traditionally be one of the terminal ram species such as Suffolk or Hampshire. First you want to take into account how much time you have and are willing to spend with your flock, if this is limited then you may consider getting an easy keeping breed, that requires little maintenance. The second thing you should consider is where you are at geographically and what is available to you in terms of feedstuffs. Do you have pasture and is it high quality? Are you in an area where feed grain is readily available? How much does hay cost around you, and how much of the year will you have to use it? What is your climate like, and do you have equipment and shelter to take care of your flock in adverse conditions? These are all things you should consider when looking at what breeds of sheep to raise. In order to be a successful operation you must select rams that will compliment the environment that you are in. For instance you would probably want to select an easy doing ram that can be maintained primarily through grazing. Breeds that may fit this scenario would be the Rambouillet, Columbia, and Dorset. If you are in a location where corn and other grains are readily available and cheap you may consider raising some of the breeds that traditionally require more supplement than just grass, these would be breeds like the Suffolk and Hampshire breeds. Another important consideration in choosing a ram is what you have planned for your breeding program; do you plan to lamb once a year or to have an accelerated lambing program where you lamb three times a year? You need to select bucks that will work during all of your chosen breeding seasons. If you plan to develop an accelerated lambing program the breeds of choice are Rambouillet and Dorset. These breeds are proven to be out of season breeders and will likely increase the total number of lambs born outside of the traditional breeding season. If on the other hand you feel that you only want to lamb once a year traditionally early in the calendar year about any breed and buck will work for you. Ram Selection Ram selection is a very important decision for a sheep producer. Whether the ram is purchased or leased, there are many variables the producer should consider before investing his flock into the sire. The ram should be examined from a few different angles: Also, purchase from a reputable producer that you can trust and feel comfortable doing business with. Phenotype The ram should have certain desirable physical traits. Not all producers need to breed to similar rams. Each flock is strong in certain traits while other flocks need improvement in those same traits. The producer should select rams that will progress their flock in those traits that need improvement. Some of these traits include but are not limited to: Length of body Length of loin and hind saddle Angle to the shoulder.

## 8: Selection Criteria for Breeding Stock

*Diet selection in sheep – the role of the rumen environment in the selection of a diet from 2 feeds that differ in their energy density. British Journal of Nutrition 35 - Cooper, S.D.B., Kyriazakis, I. and Oldham, J. D.*

The decrease in variability caused by positive selection tends to be broken by recombination events. Because of this, Kim and Stephan proposed a composite likelihood approach for detecting positive selection in a recombining chromosome. The test is based on the expected number of sites where the derived allele is part of a given frequency interval in the population. More recently, extensions of these tests based on the frequency spectrum around a selective sweep have been proposed. These new methods can deal with genomic data and account for the ascertainment bias Nielsen et al. Tests based on linkage disequilibrium Exploitation of the LD patterns is the focus of several tests for detecting selection Sabeti et al. However, these signatures tend to be transient since the recombination tends to quickly break down this LD as soon as the selected locus reaches fixation Przeworski, ; Kim and Nielsen, ; McVean, This test starts with identification of the core haplotypes through genotyping a set of single nucleotide polymorphisms SNPs in a region so small that recombination may not occur. Subsequently, other SNPs at increasing distances from the core haplotypes are analyzed to evaluate the decay of LD according to distance Sabeti et al. The LD is measured at increasing distances from the core haplotypes through calculation of the extended haplotype homozygosity EHH , which is the probability that two chromosomes carrying a specific core haplotype are homozygous for the whole region from the core to a distance  $x$  Sabeti et al. Positive selection is inferred if one core haplotype has a combination of high REHH and high frequency in the population Sabeti et al. An extension of the LRH test was proposed by Voight et al. This test is referred to as the iHS integrated haplotype score and was designed to work on a genomic scale using information from dense SNP chips. The iHS value can be defined simply as a measure of how unusual the haplotypes around an SNP are, compared to the genome Voight et al. This value is then standardized to allow direct comparisons among different SNPs regardless of allele frequencies Voight et al. This measure can be defined as the count of allelic differences between the reference allelic class and the individual haplotypes in the sample. The statistic proposed is referred to as Svd, with positive values suggesting positive selection Hussin et al. The LRH and iHS tests rely on the frequencies of alleles at core SNP and therefore have reduced power for detecting selection when the selected allele has reached fixation. To deal with situations in which the selected allele is fixed in one population but remains polymorphic in others, LRH-derived tests based on pairwise comparisons among populations have been proposed Kimura et al. The  $\ln R_{sb}$  statistic proposed by Tang et al. Tests based on population differentiation The estimation of  $F_{ST}$  from multiple loci and comparison of these values with its neutral expectations is the basis of several tests aimed at identifying selection Lewontin and Krakauer, ; Bowcock et al. The first effort in this direction was proposed by Lewontin and Krakauer They suggested that the  $F_{ST}$  estimated from several loci under neutrality must show small heterogeneity; however, if selection is acting on some of them then the estimates of  $F_{ST}$  tend to vary widely. The Lewontin and Krakauer test involves comparison between the variance of  $F_{ST}$  estimated from the data and the expected variance of  $F_{ST}$  under neutrality through a variance ratio test Lewontin and Krakauer, To avoid the effects of population structure, Bowcock et al. More recently, models capable of generating the null distribution of  $F_{ST}$  that are robust to population history and structure recent divergence and growth, isolation by distance and heterogeneous levels of gene flow between populations have been proposed Beaumont and Nichols, ; Beaumont and Balding, ; Foll and Gaggiotti, ; Excoffier et al. The methods proposed by Beaumont and Nichols and Excoffier et al. On the other hand, Markov chain Monte Carlo MCMC based methods Beaumont and Balding, ; Foll and Gaggiotti, efficiently accommodate some departures from model assumptions but are computationally very intensive. Another way to avoid the effects of demography is to perform pairwise comparisons between populations Tsakas and Krimbas, Based on this idea, Vitalis et al. This approach seems to be robust against departures from model assumptions and also tends to remove the bias introduced by unknown population structure. However, the pairwise comparison tends to reduce the power of the test because information from other populations is discarded Tsakas and Krimbas, ;

Vitalis et al. This analysis is implemented in the software DetSel 1. The foregoing discussion has shown that there are currently several approaches for detecting footprints left by selection. Each of these approaches can capture specific patterns of molecular variation. The use of a combination of alternative approaches for detecting selection signals is an interesting strategy that has been suggested as a means of increasing the reliability of these studies. However, the success of one test and failure of another does not exclude the region of interest from having been subjected to selection since different tests can focus on different signals left by selection or look for different time scales in which the selection can act Hohenlohe et al. Selection signatures in livestock Domestication has resulted in considerable changes in the morphology and behavior of livestock species. In the early stages of domestication, unconscious selection for behavioral traits was applied. This early stage was followed by methodical selection in which specific traits were selected based on goals Diamond, ; Gregory, The development of specialized breeds, improved to produce specific products or to reach a morphological standard, increased the differences between domesticated animals and their wild relatives and also generated an enormous variety of different populations, with specific traits related to their specialization. Some of these traits are controlled by several interacting genes with minor effects. This creates an exceptional opportunity to gain knowledge of the molecular basis of these traits, particularly since most economically important traits in livestock are quantitative Andersson and Georges, The identification of genes targeted by selection in livestock can help to find and prove causal mutations in regions previously identified by QTL mapping experiments and can reveal genes related to ecological traits e. Signatures associated with domestication and early breed development In some wild species, the expression both of eumelanin and pheomelanin pigments is related to a camouflaged coat color. During domestication, non-camouflaged coat patterns were selected because of their direct effect on animal husbandry and also because these patterns may have been used as markers associated with improved individuals, or because of cultural preferences Fang et al. The melanocyte stimulating hormone receptor gene MC1R influences the production of eumelanin and pheomelanin pigments Werth et al. Other genes that influence coat color pattern were also suggested to be under selection in domestic species. Behavioral changes, such as a reduction in fear and anti-predator responses and an increase in sociability, are believed to be important reflections of animal domestication Diamond, ; Amaral et al. Indeed, several studies in livestock suggest selection signatures surrounding genes related to nervous system development and function The Bovine HapMap Consortium, ; Gautier et al. Cattle Various studies in beef cattle using approaches such as differences in allele frequencies, iHS and FST have found selection signals in the centromeric region of BTA14 Hayes et al. An increase in intramuscular fat percentage in Australian Angus in recent years, together with a significant effect of this region on fat traits, may corroborate with the selection signature found in these studies Hayes et al. The double muscled phenotype has been selected in some beef breeds and mutations in the Growth Differentiation Factor 8 also known as myostatin or GDF-8 gene are related to this phenotype Bellingue et al. A decrease in heterozygosity around this gene has been demonstrated in double muscled breeds Wiener et al. This region was associated with feed efficiency and intramuscular fat in beef breeds Barendse et al.

### 9: NMSU: Sheep Production & Management - selection and breeding

*This is a list of domestic breeds of [www.enganchecubano.com](http://www.enganchecubano.com) sheep (*Ovis aries*) are partially derived from mouflon (*Ovis orientalis*) stock, and have diverged sufficiently to be considered a different species.*

**Minimizing Genetic Defects** Since life began, animals best adapted to their environment have survived and produced the largest number of offspring. For example, most breeds of sheep that originated in the British Isles survived only if they were born in the spring when the temperature was mild and feed was available. That is natural selection. Selection should be a part of all breeding sheep production enterprises. It is effective for almost all the important economic traits in sheep. No selection program, however, can improve all these economically important traits at once. Generally, the more traits involved in selection, the less improvement will result for a single trait. The first step in any selection program is to identify the traits of greatest economic importance. They may be growth rate, carcass merit, fleece traits, or reproductive efficiency. The improvement that can be made depends on: Accurate measurement of the trait. Complete records on the flock. The amount of selection pressure applied. The amount of variation of the trait or different traits among individuals within the flock. If the sheep do not vary genetically, then no improvement can be made. If they vary greatly, then improvement will be rapid when producers select only the individuals that excel in the expression of important traits. The heritability of the trait. Variation in any economic trait is caused by genetic differences and environmental differences. Variation that results from differences in heredity is broadly defined as heritability. Researchers have estimated the heritability the ability to "pass on" traits to offspring of the economically important traits table 1. Generally, if the heritability estimate is less than 20 percent, progress is slow. A heritability estimate of 20 to 40 percent is considered medium. A heritability estimate greater than 40 percent is high. Purebred breeders should be committed to improving the economically important traits of their breed. Their breed serves as a source of genetic material for crossbreeding and for improving the industry. On the other hand, commercial sheep producers might find it more profitable to crossbreed. Some economically important traits that can be improved only slowly within a breed can be improved more rapidly with effective crossbreeding. An example is rate of reproduction. By most estimates, the heritability of reproductive traits is low. However, hybrid vigor expression of a trait above the average of the dam and sire for that trait exists for rate of reproduction. Generally, crossbred ewes exhibit a higher reproduction rate, produce more milk, and their lambs are stronger at birth. Heritability of traits in sheep Trait.

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