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ALABAMA A&M AND AUBURN UNIVERSITIES

Performance Evaluation for Small Ruminants

Performance evaluation relevant to livestock production is something traditional livestock producers have been doing for years. The sheep and goat industry is considered a nontraditional form of livestock production and might be well served to follow some of the same practices.

Producers new to the industry may be unaware of evaluation practices associated with livestock assessment and could shortchange their operations in determining production efficiencies and inefficiencies. The ability to document and analyze data based on individual animal performance and to compare it to herd average serves as a valuable management tool. As farm managers, each owner or operator must develop a tangible record-keeping system that will facilitate in-depth evaluation.

As a form of livestock production, goat and sheep farms should be run as efficiently as possible. Determining production efficiencies requires basic documentation and tracking of individual animals. With a little time and effort, basic record keeping can be expanded to further evaluate individual livestock performance and compare it to herd average. Cumulative data and calculations facilitate performance evaluations that serve goat and sheep farmers with the capability to identify production inefficiencies. Documenting the performance of each animal's production, reproduction, and health status within a livestock operation provides producers with insight on how to improve their operations in the future. Performance evaluation analysis, along with a bit of common sense, will improve farm management abilities.

Basic Record Keeping

Basic record keeping begins with a notebook and a concept of how the producer plans to organize the acquired information. Categories a producer needs to include for various aspects of performance evaluation are animal identification (to know which animal is being documented); pedigrees (sires and dams); performance records (kidding rates, etc.); health records (health issues); and kidding information (birth weights, gender, and weaning weights). This information gives the producer the ability to evaluate strengths or weaknesses of individual animals and allow for inner-herd comparisons. The information documented on a notebook can later be transferred to a computer spreadsheet for further examination and validation.

Individual animal identification (ID) is fairly simple and has several options. Goat and sheep farmers who choose to register their animals tend to use tattoos for individual animal identification. A farm ID is tattooed in one ear, while a unique animal ID goes in the other ear. This type of ID is not easily read without constraining the animal, so other options, such as a plastic ear tag or plastic chain with an ID tag, may be more practical. Plastic ID tags can be readily verified from a short distance. These tags are available in different colors and sizes and generally are stamped with sequential numbers. Blank tags also are available on which a permanent marker can be used to write ID information.

Ear tags showing a 94+ percent doe [white tag] and 88 percent kids [yellow tags].

Pedigree information is important for several reasons. To register offspring, a producer must have pedigree documentation regarding sires and dams. Tracking sires, dams, and offspring serves for evaluating genetic crosses that may or may not result in overall improvement, which is based on visual confirmation and grow-out rates of offspring. Pedigree information and the ability to register animals make the difference between having meat animals or brood stock and show animals. A good meat animal may sell for $50 to $100, while a good brood animal may readily sell for several hundred dollars.

Performance records serve to evaluate individual animals and provide the ability to compare the performance of one animal to another. This type of evaluation or comparison is probably best done on a computer spreadsheet. Breeding and estimated birthing dates are one component that needs to be documented. If a doe does not kid as expected, fertility (sires and dams) may come into question. If the dam prematurely loses her offspring or does not take care of it, this should be documented. Also note if the dam is a first-time mother or how many times she has delivered. Always document how many offspring each mother delivers and the offspring's gender and birth weight.

Recording birth and weaning weights for each kid or lamb is essential for further analysis. Documentation of birth weight, weaning weight, and weaning age are used to calculate individual performance regarding the amount of weight gained per day from the time the kid or lamb was born until weaning age. This calculation is known as average daily gain (ADG). Knowledge of ADG per animal identifies which animals are gaining more or less than others and may reflect back on dams and sires.

When a producer has this information, he or she can calculate the ADG for the herd, compare it to individual ADGs, and calculate a ratio for herd comparison. This information can be compared from year to year and can show if herd production is improving. See the table below for an example of goat performance evaluation. This table also is suitable for sheep production and evaluation.

Note that the ADG, once converted from ounces to pounds, varies from 0.24 (just under

Animal ID	**Birth Weigh** *Within 12 Hours*	*Oz.*	**Weaning Weight** *At Appx. 3 Months*	*Oz.*	**Age** In Days	**ADG (Ounces)** WW - BW/Days	**Conversion Ounces to Pounds**	**ADG Ratio**
W-36	10 lbs. 8 oz.	168	65 lbs.	1040	90	10	0.61	16
W-47	9 lbs. 2 oz.	146	55 lbs.	880	90	8	0.51	6
W-48	7 lbs. 9 oz.	121	32 lbs.	512	90	4	0.27	-18
Y-19	8 lbs. 12 oz.	140	58 lbs.	928	90	9	0.55	10
Y-18	8 lbs. 4 oz.	132	42 lbs.	672	90	6	0.38	-7
Y-22	7 lbs. 14 oz.	126	39 lbs.	624	90	6	0.35	-10
Y-23	8 lbs. 6 oz.	134	40 lbs.	640	90	6	0.35	-10
R-77	9 lbs. 8 oz.	152	60 lbs.	960	90	9	0.56	11
R-78	9 lbs. 12 oz.	156	62 lbs.	992	90	9	0.58	13
R-66	10 lbs. 2 oz.	162	66 lbs.	1056	90	10	0.62	17
G-18	7 lbs. 15 oz.	127	32 lbs.	512	100	4	0.24	-21
G-19	9 lbs. 1 oz.	145	47 lbs.	752	100	6	0.38	-7
						Herd Avg	0.45	
							(Total ADG/12)*100	

Ear Tag Code

W – White ear tag = Full-blood (94 percent+, does; 100 percent bucks)

Y – Yellow ear tag = 88 percent does

R – Red ear tag = 75 percent does

G – Green ear tag = 50 percent does

Notched ear tag = Any color buckling/ meat goat

WW = Weaning weight

BW = Birth weight

1/4 pound daily gain) to 0.62 (well over 1/2 pound daily gain), which is a substantial variation. Based on information from other experts, an ideal ADG ranges from 0.33 (1/3 pound daily gain) to 0.50+. Any animal with less than 0.33 ADG might be considered a cull animal; any animal that falls within the range of 0.33 to 0.50 should be considered desirable; and any animal with an ADG greater than 0.50 should be considered prime breeding stock.

To some, the ADG ratio may seem unimportant, but upon closer examination, it serves as a valuable tool. It allows comparison of each animal's average daily gain to the ADG for herd average. Note that the herd average is 0.45, and the ADG average for each animal ranges from negative 21 percent to positive 16 percent. Negative is undesirable, and positive is desirable. The smaller the number, the closer it is to the average ADG of 0.45. This type of analysis serves as a more in-depth culling tool and, when compared annually, should demonstrate continued improvement.

Health records are valuable because they readily show which animals have health problems and which are hardier. Health problems include anything that involves frequent medical treatment, repeated services of a veterinarian, or reoccurring problems with parasites. Any animals requiring repeated special attention should be considered potential candidates for culling. Unless an animal is very valuable (value being a relative term), its value may not offset the cost of frequent health care.

Documentation of kidding and lambing information is important for several reasons. First, it shows which dams are productive and what they tend to produce. Any dam that produces twins is a keeper; dams that produce anything else (single, triplets, quads, etc.) require closer evaluation. A first-time mother that produces singles should be given a second chance; her reproductive system may not be fully developed the first time and, therefore, she is only capable of producing one off-spring. Second, any dam that has birthing complications may need to be considered for culling. Losing a dam and kids or lambs because of birthing problems is not worth the cost of an animal. Also, documenting the gender of offspring may reflect on the traits of the herd sire. For example, more female than male animals born on a farm could be a concern. If a producer intends to raise brood stock, he or she will want more females, but if the producer wants to raise meat goats, too many females could be undesirable.

Finally, record keeping verifies productivity of each dam. If a dam is not producing offspring on a regular basis (every 8 to 12 months), a farm operation is being shorted on potential animals and income if a dam is not producing offspring regularly (every 8 to 12 months). The unproductive animal is a financial burden and should be evaluated for culling.

To improve production efficiencies, goat and sheep farmers should learn to document and utilize data collected. Data on production performance, reproduction, and health issues provide small ruminant producers with a good understanding of potential areas for improvement. Developing and utilizing a record-keeping system allow producers to compile animal performance data. The data collected can be used to analyze individual animal performance and compare them to herd average. Traditional livestock producers have successfully utilized performance recording and genetic evaluation programs for years, and small ruminant operations will benefit significantly from implementing the same practices. Such efforts will provide tangible evidence that should facilitate improved production and management practices and minimize inefficiencies.

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