

Keeping and Using Flock Records

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Flock record-keeping is a vital component of a successful sheep enterprise. Most often we associate the term “records” with information related to production, such as identification, various weights, inventory, and health information. A more comprehensive definition would also include financial records, particularly those items related to enterprise expenses and income. The 2011 USDA National Animal Health Monitoring System (NAHMS) study reported that 86.7% of all sheep operations with 20 or more ewes kept records. The most typical production records taken included number of lambs born (89.2%), number of lambs weaned (77.5%), inventory (79.7%), breeding records (71.9%), and health/vaccination records (68.4%). Individual birth weights and weaning weights, however, were not frequently recorded (15.7% and 14.7%, respectively).

Records are a valuable tool for any sheep production enterprise as they are necessary for documentation and evaluation of many factors which impact profitability. In the absence of records, implementing changes in management that enhance the profitability of the flock either through increased income and/or controlling costs of production are very difficult. Since each sheep enterprise is unique, an operation's record-keeping system needs to be tailored to fit the needs of that particular flock based on its management practices, goals, and objectives. Hence, there are various ways that effective flock record-keeping can be achieved. The key is finding a system which is applicable, practical, and usable for your operation. Following are some basic guidelines which can be adapted to meet various record-keeping needs.

Animal Identification

Individual animal identification serves as the template for an effective record-keeping system. Individual identification allows for monitoring of basic flock performance parameters, and is a necessary component of quality assurance (identification of individual animals for health treatments, vaccination, etc.).

Ear tags- Ear tags are the most common and practical form of individual animal identification. There are many types and sizes of ear tags on the market, designed for various purposes. The ideal ear tags are those that have high retention rates, are easy to read, and easy for the shepherd to apply. Proper location of the ear tag in the ear is important for retention. The USDA Scrapie Identification Program requires most all sheep to carry an official scrapie tag upon leaving the flock of origin. Consequently, most producers utilize an official scrapie ear tag which also serves as their individual flock tag. Keep in mind that official scrapie tags can be customized to meet the needs of an individual flock (animal numbers can be specified). With any ear tag system, the individual numbers utilized can be useful as a flock management tool. For example, the tag number sequence can be designated to indicate year of birth (1501, 1502, etc. for lambs born in 2015; or similar). Similarly, tags differing in color can be used to designate different groups/breeds within the same flock. Note this customization can be used in conjunction with official scrapie tags. With regard to tag size, it is important to find a tag that is compatible with the size and age of sheep being tagged. Consequently, a common practice is to utilize a small lamb tag at birth followed by a second, larger tag

(such as a scrapie) tag applied at an older age (weaning). This system has multiple benefits, as each lamb will have two tags and maintain identity even if one tag is lost, and applying a larger tag enhances readability and also can be made compatible with scrapie identification requirements. Another common practice is to tag male and female lambs in different ears for rapid identification of gender when sorting or performing other management practices.

Tattoos- Tattoos are a viable form of permanent identification. While the identification is permanent, the challenge with tattoos is they are difficult to read as sheep must be caught. As a result, tattoos are best used as a compliment to ear tags in breeding stock. Tattoos can be applied to replacement ewe lambs, and will assure lifetime identification if done correctly. Tattoos are also commonly used in registered breeding stock.

Temporary Forms of Identification- Paint brands, chalks, and spray marks are all forms of temporary identification. All can be effective short-term, particularly for identifying a few individuals (animals receiving health treatment for example). A common use of paint brands or markings is to identify each ewe and her lambs with the same brand upon leaving the lambing jug. This is an excellent management tool, particularly in larger flocks.

Production Records

Basic flock records which should be kept to monitor flock performance include: ewe ID, sire ID, lamb ID, lamb gender, birth date, birth type, rear type, and any notes/comments (lambing ease, mothering ability, lamb vigor, etc.). Along with this, birth, weaning, and post-weaning weight records provide the opportunity to make selection decisions on these traits as well as provides guidance on management decisions.

Record-keeping systems for these traits come in many forms, including paper forms, notebooks or pocketbooks, electronic spreadsheets, and computer record keeping systems. Following are some sample templates for records sheets that can be printed and used on a clipboard or binder in the barn, or converted to electronic form. Shepherds can customize these templates to meet the needs of their flock, depending on the information desired and collected.

Lambing Record- The most basic form of record keeping, used to record basic information on each individual born in the flock.

Ewe Lifetime Record- Summary of a ewe's lifetime performance and includes information across multiple lambing seasons.

Health Record- Documents all health-related procedures performed on the flock either to groups or to individuals. Serves as the basis for quality assurance to observe withdrawal times prior to marketing or harvest.

Inventory Record- Simple record which records inventory numbers during the production cycle. For example, number of ewes exposed to rams and dates, marketing dates and information for lambs and breeding stock or culls, death losses, etc.

Weight Records

As mentioned earlier, weight records are needed for genetic improvement of growth. To effectively utilize weight records, they must be properly adjusted to remove the effects

of lamb age and sex, along with age of the ewe (weaning weight). The following provides basic formulas used to adjust weaning and post-weaning weights. Note that the weights of lambs should only be compared within contemporary group- a contemporary group is defined as a group of animals all raised together in the same environment and given the same opportunity to perform (born together, fed and managed together and of the same general age).

Lamb Adjusted Weaning Weights (45-90 days of age at weaning):

Adj. WW = ((actual WW- actual BW)/age in days) x 60 x WW adj. factor + actual BW
(*if BW not available omit BW from equation)

Lamb WW Adjustment Factors for Lamb Sex, Dam Age, Type Birth & Rearing

Lamb Sex	Dam Age	Birth/Rear Type					
		S/S	TW/S	TW/TW	TR/S	TR/TW	TR/TR
Ewe	1	1.13	1.29	1.38	1.40	1.51	1.80
	2 and over 6	1.08	1.19	1.29	1.28	1.38	1.54
	3 to 6	1.00	1.10	1.19	1.18	1.27	1.36
Ram	1	1.02	1.15	1.21	1.23	1.31	1.53
	2 and over 6	0.98	1.08	1.17	1.16	1.25	1.38
	3 to 6	0.91	1.00	1.08	1.07	1.15	1.23
Wether	1	1.10	1.25	1.33	1.36	1.45	1.72
	2 and over 6	1.05	1.16	1.26	1.25	1.35	1.50
	3 to 6	0.98	1.08	1.16	1.15	1.24	1.33

Lamb Post-Weaning Adjusted 120- day Weight (90-150 days of age):

Adj. PWW = ((actual PWW – actual WW)/(actual PWW age – actual WW age)) x 60 + Adj. WW

Computerized Record Keeping Systems

Many record-keeping systems can be converted from paper form to spreadsheet and database form. Additionally, there are several software packages available commercially that are designed for flock record-keeping. These programs can be used to collect and store records, as well as sort and summarize records. Many also calculate adjusted weights, and some also contain a component to store health records. Price on these programs is variable and can range from \$50 to \$250+, although several of the programs are available at no cost on a trial basis.

National Sheep Improvement Program

The National Sheep Improvement Program (NSIP) conducts the genetic evaluation for the US sheep industry. Through NSIP, across-flock Expected Progeny Differences (EPDs) are calculated for several economically important traits including growth, maternal, carcass, wool and parasite resistance traits. Producers enrolled in NSIP submit flock performance data electronically, and receive back EPDs on their animals for their traits of interest. EPDs provide estimates of the genetic value of an animal as a parent. Specifically, differences in EPDs between two individuals predict differences in performance between their future offspring when each is mated to animals of the same average genetic merit. Complex statistical equations and models use all known information on a particular animal to calculate its EPD. This information includes

performance data (i.e., weight records) on the animal itself, information from its ancestors (sire and dam, grandsire, great grandsire, maternal grandsire, etc.), collateral relatives (brothers and sisters), and progeny (including progeny that are parents themselves). In short, virtually all performance data that relates to the animal of interest is used to calculate its EPD. Additionally, genetic merit of mates is accounted in evaluating progeny information. The statistical analysis used for EPD calculation also accounts for the effects of environment (nutrition, climate, geographical location, etc.) that exist between flocks. Consequently, EPDs generated through the across-flock NSIP analysis allows EPDs to be compared on sheep from different flocks of the same breed. As a result, EPDs derived through NSIP are the best tool for genetic improvement as they a direct prediction of genetic merit. The cost for enrollment in NSIP includes an annual flock fee as well as a fee per ewe enrolled. For more details on NSIP visit <http://nsip.org/> .

Utilizing Records

The power of flock records is in their utilization as a flock management and evaluation tool. The following table outlines several important production and financial parameters which are related to profitability, and the records needed to assess those parameters.

Performance Parameter	Record(s) Required
Pregnancy Rate	Breeding inventory, lambing records
Lambs born per ewe lambing	Lambing records
Lambs born per ewe exposed	Breeding inventory, lambing records
Lambs marketed/retained per ewe lambing	Inventory, lambing records
Lamb death loss (at various stages)	Lambing records, inventory
Lamb WW, Post-WW (sale weight)	Weight records
Pounds of lamb weaned/sold per ewe lambing	Lambing records, inventory, weights
Pounds of lamb weaned/sold per ewe exposed	Lambing records, inventory, weights
Lamb ADG	Weight records
Feed costs per ewe	Inventory, expense records
Total costs per ewe	Inventory, expense records
Lamb cost of gain	Weight records, feed/other expenses
Profit/loss (total or per ewe)	Production, expense, income records

Note that several important benchmarks above integrate production and financial records. For details on expense and income record-keeping and their utilization see “Key Components to Making Money in the Sheep Business” presented at a previous Sheep Symposium and available at http://www.apsc.vt.edu/extension/sheep/programs/shepherds-symposium/2008/07_key_components.pdf

Summary

A fundamental component of enhancing profitability is making sound decisions, and having the ability to assess opportunities for cost control or revenue enhancement. This

ability is dependent on flock financial and production data. The ability to make sound decisions is dependent on accurate records for income sources and costs of production, as well as basic production parameters for the flock. Essential records include both usage and costs associated with pasture and feed, health, breeding, facilities, and marketing. Essential production records include inventory, pregnancy and lambing rates, death loss, and marketing weights along with detailed receipts for income generated.

