

SPA  
Standardized Performance Analysis  
For Sheep Producers

-- A Worksheet Approach --

Sheep producers have been challenged to be lower cost producers, to become more competitive, and to increase market share and profits. The first step to becoming more efficient is to clearly determine and understand current production and financial performance. The Standardized Performance Analysis (SPA) system developed by the American Sheep Industry Association (ASI) is a tool to assist sheep producers in calculating reproduction, production, financial, and economic performance measures.

The purpose of these worksheets is to provide the producer with the formulas and procedures for calculating the most commonly used production and financial measures. Monitoring these measures over time can help farm managers identify potential areas for change and help measure progress in meeting business goals and objectives. These results will help facilitate comparative analysis between production years, producers, production regions, and production systems. The worksheets in the publication were developed with the intent to provide a "user friendly" format for calculating several of the SPA measures.

**Worksheet 1: Measuring Reproduction and Production Performance**

The calculation column is designed for the producer to write down the required information necessary to perform the calculation. The answer column is then used to record the results of the calculation. The database column lists the maximum and minimum range of values collected from producers and the average of these numbers is listed below the range.

Example:		Calculation	Answer	Database Results
		_____	_____	_____
Preg. Rate (Percentage) =	No. of exposed ewes diagnosed as pregnant	94		62 - 100 Range
	<u>No. of exposed ewes</u>	<u>100</u>	.94 or 94%	88% Avg.

Note: The procedure for calculating the number of exposed ewes is at the bottom of Worksheet 1. The results of this calculation are used frequently in the reproduction and production measures.

**WORKSHEET 1: MEASURING REPRODUCTION AND PRODUCTION PERFORMANCE**

		<u>Calculation</u>	<u>Answer</u>	<u>Database Results</u>
<b>Breeding and Gestation Performance Measures:</b>				
<b>1. Pregnancy Rate (Percentage) =</b>	$\frac{\text{No. of exposed ewes diagnosed as pregnant}}{\text{Number of exposed ewes}}$	_____	_____	62 - 100 88%      Range Avg.
<b>2. Pregnancy Loss Percentage =</b>	$\frac{\text{No. of exposed ewes diagnosed as pregnant that failed to lamb}}{\text{No. of ewes diagnosed as pregnant}}$	_____	_____	2.9 - 5.7 4.5%
<b>3. Lambs Born Per Ewe Lambing =</b>	$\frac{\text{No. of lambs born}}{\text{No. of ewes lambing}}$	_____	_____	1.0 - 2.3 1.6 lambs
<b>4. Lambs Born Per Exposed Ewe =</b>	$\frac{\text{No. of lambs born}}{\text{No. of exposed ewes}}$	_____	_____	1.0 - 2.2 1.5 lambs

**Weaning Performance Measures:**

<b>5. Percent Lamb Survival =</b>	$\frac{\text{No. of lambs weaned}}{\text{No. of lambs born}}$	_____	_____	66 - 100 90%
<b>6. Lambs Weaned Per Exposed Ewe =</b>	$\frac{\text{No. of lambs weaned}}{\text{No. of exposed ewes}}$	_____	_____	.8 - 2.0 1.3 lambs
<b>7. Average Weaning Weights =</b>	$\frac{\text{Total pounds of lamb weaned}}{\text{Total no. of lambs weaned}}$	_____	_____	47 - 120 82 lbs.
<b>8. Lbs. of Lamb Weaned Per Exposed Ewe =</b>	$\frac{\text{Total pounds of lamb weaned}}{\text{No. of exposed ewes}}$	_____	_____	54 - 200 103 lbs.
<b>9. Lbs. of Wool Per Exposed Ewe =</b>	$\frac{\text{Total pounds of wool}}{\text{No. of exposed ewes}}$	_____	_____	5.9 - 15.1 9.3 lbs.

**Calculating Number of Exposed Ewes:**

	<u>Calculation</u>	<u>Answer</u>
Total number of ewes exposed to rams at the beginning of the breeding season.		_____
Ewes identified as culls not intended to be lambred.	(subtract)	_____
Ewes sold or transferred out before breeding season ends.	(subtract)	_____
Exposed ewes purchased or transferred in during the breeding season.	(add)	_____
Pregnant ewes or ewes with nursing lambs transferred out.	(subtract)	_____
Pregnant ewes or ewes with nursing lambs transferred in.	(add)	_____
<b>NUMBER OF EXPOSED EWES</b>		_____

## **WORKSHEET 2: CALCULATING COST PER EWE WORKSHEET**

This worksheet is designed to guide the producer through the process of calculating the cost per ewe. The direct operating cost categories include: feed costs (purchased and raised feed), grazing expenses, and non-feed/non-grazing expenses.

Total feed costs are major production costs for the sheep enterprise. Purchased feed includes expenses for feed purchased as well as, actual or estimated, expenses incurred when feeding (i.e., labor, fuel, lube, machinery and equipment depreciation, etc.). Raised feed expenses include expenses, actual or estimated, incurred for feed production and feeding (i.e., chemicals, fertilizers, seed, fuel, labor, repairs, rents and leases, property taxes, machinery hire, and machinery and equipment depreciation).

Grazing expenses include costs related to the grazing activity (i.e., fencing, pasture and water improvements, and maintenance). For example, these expenses would include fuel and lube, labor, fertilizer, repairs, and other costs directly related to grazing.

Non-feeding/non-grazing expenses include all other expenses that can be directly tied to the sheep enterprise. For example, veterinary and medicine, breeding fees, shearing expense, freight and trucking, and supplies.

The indirect operating costs are those cash and non-cash expenses that cannot be easily associated with the sheep enterprise. These may include real property taxes, utilities, insurance, supplies, conservation expenses, etc. The financial cost of financing is the actual interest paid on borrowed capital but does not include principle payments. Real estate financing cost is the interest portion of the mortgage payment. Total costs include total operating costs (direct and indirect) plus total finance costs. Total cost per breeding ewe equals total costs divided by the average number of breeding ewes.

To estimate the total expense for the sheep enterprise it may be necessary to allocate total ranch expenses to an individual enterprise. There is no completely accurate procedure available to accomplish this task. Allocation can be based on time spent, mileage, hours, revenues, etc. Allocate costs by any method that seems fair for the enterprises involved.

**WORKSHEET 2: CALCULATING COST PER EWE WORKSHEET**

Database  
Results

**1. DIRECT OPERATING COSTS**

**Feed Costs:**

Purchased Feed Costs:

Hay \_\_\_\_\_  
Grains/Concentrates \_\_\_\_\_  
Supplements \_\_\_\_\_  
Salt & Mineral \_\_\_\_\_  
Freight & Trucking \_\_\_\_\_  
Storage \_\_\_\_\_  
Other Purchased Feed Costs \_\_\_\_\_

Total Purchased Feed Costs \_\_\_\_\_ (a)

Raised Feed Costs:

Fertilizer \_\_\_\_\_  
Chemicals \_\_\_\_\_  
Seed \_\_\_\_\_  
Fuel & Lube \_\_\_\_\_  
Machine Hire \_\_\_\_\_  
Hired Labor \_\_\_\_\_  
Rents & Leases \_\_\_\_\_  
Property Taxes \_\_\_\_\_  
Depreciation \_\_\_\_\_  
Other Raised Feed Costs \_\_\_\_\_

Total Raised Feed Costs \_\_\_\_\_ (b)

**Total Feed Costs (a + b)**

\_\_\_\_\_ (c)

5 - 216  
\$51

**Grazing Expense:**

Grazing Costs:

Fencing \_\_\_\_\_  
Pasture Improvements \_\_\_\_\_  
Water Improvements \_\_\_\_\_  
Trucking \_\_\_\_\_  
Fuel & Lube \_\_\_\_\_  
Maintenance \_\_\_\_\_  
Other Grazing Costs \_\_\_\_\_

Total Grazing Costs \_\_\_\_\_ (d)

Real Estate Costs on Grazing Land:

Lease Payments \_\_\_\_\_  
Property Taxes \_\_\_\_\_  
Real Estate Interest Pmt. \_\_\_\_\_  
Depreciation \_\_\_\_\_  
Other Real Estate Costs \_\_\_\_\_

Total Real Estate Costs \_\_\_\_\_ (e)

**Total Grazing Expense (d + e)**

\_\_\_\_\_ (f)

0 - 27  
\$12

**CALCULATING COST PER EWE WORKSHEET CONTINUED**

Database  
Results

**Sheep & Other Non-Feed & Non-Grazing Expense:**

Veterinary & Medicine \_\_\_\_\_  
 Breeding Fees \_\_\_\_\_  
 Shearing Expense \_\_\_\_\_  
 Insurance \_\_\_\_\_  
 Utilities \_\_\_\_\_  
 Freight & Trucking \_\_\_\_\_  
 Fuel & Lube \_\_\_\_\_  
 Hired Labor \_\_\_\_\_  
 Repairs & Maintenance \_\_\_\_\_  
 Supplies \_\_\_\_\_  
 Utilities \_\_\_\_\_  
 Miscellaneous \_\_\_\_\_  
 Mach. & Equip. Depreciation \_\_\_\_\_  
 Bldg. & Improv. Depreciation \_\_\_\_\_  
 Other Sheep Expenses \_\_\_\_\_

**Total Sheep & Other Non-Feed & Grazing Expense** \_\_\_\_\_ (g)

**TOTAL DIRECT OPERATING COSTS (c + f + g)** \_\_\_\_\_ (h)

**2. INDIRECT OPERATING COSTS**

Real Property Taxes \_\_\_\_\_  
 Utilities \_\_\_\_\_  
 Insurance \_\_\_\_\_  
 Supplies \_\_\_\_\_  
 Other: \_\_\_\_\_  
 Other: \_\_\_\_\_  
 Other: \_\_\_\_\_  
 Other: \_\_\_\_\_  
 Other: \_\_\_\_\_

**TOTAL INDIRECT OPERATING COSTS** \_\_\_\_\_ (i)

**3. FINANCE COSTS**

Interest Payments - Operating Loans \_\_\_\_\_  
 Interest Payments: Non-Real Estate \_\_\_\_\_  
 Interest Pmts.: Real Est. (Raised Feed Land) \_\_\_\_\_  
 Interest Pmts.: Real Estate (Grazing Land) \_\_\_\_\_  
 Other Interest Payments \_\_\_\_\_

**TOTAL FINANCE COSTS** \_\_\_\_\_ (j)

**TOTAL COSTS (OPERATING + FINANCE) (h+i+j)**

\_\_\_\_\_ 29 - 335  
 \_\_\_\_\_ \$105

Calculation

Answer

Total Cost  
Per Breeding Ewe =  $\frac{\text{Total Operating Cost} + \text{Total Finance Cost}}{\text{Average No. of Breeding Ewes}}$  \_\_\_\_\_

Average No. of  
Breeding Ewes =  $\frac{\text{Beginning Fiscal Year Inventory} + \text{Ending Fiscal Year Inventory}}{2}$

### WORKSHEET 3: MEASURING FINANCIAL & ECONOMIC PERFORMANCE

The enterprise financial data are developed from the operation's financial statements (balance sheet and income statement) and/or enterprise records. Worksheet 2 was created to assist in calculating many of the measures in Worksheet 3 (measures 4, 5, 6, 8 and 9). It is important to include all revenues and expenses, whether paid or yet to be paid, in production of lamb and wool in a given period. A simple balance sheet has been provided below to assist with the calculation for measures 1, 2 and 3. Be sure to include only those assets and liabilities that are used to support the sheep enterprise.

#### Balance Sheet -- Sheep Enterprise

	Beginning <u>Balance</u>	Ending <u>Balance</u>		Beginning <u>Balance</u>	Ending <u>Balance</u>
<b>CURRENT ASSETS</b>			<b>CURRENT LIABILITIES</b>		
Cash & Checking	_____	_____	Accounts Payable	_____	_____
Accounts Receivable	_____	_____	Notes Payable	_____	_____
Prepaid Expenses	_____	_____	Current Portion of Term Debt	_____	_____
Inventories:			Accrued Interest	_____	_____
Marketable Livestock	_____	_____	Taxes Payable	_____	_____
Stored Crops & Feed	_____	_____	Deferred Taxes	_____	_____
Purchased Feed	_____	_____	Other Current Liabilities	_____	_____
Supplies	_____	_____	Other _____	_____	_____
Other Current Assets	_____	_____	Other _____	_____	_____
<b>TOTAL CURRENT ASSETS</b>	_____	_____	<b>TOTAL CURRENT LIAB.</b>	_____	_____
<b>NON-CURRENT ASSETS</b>			<b>NON-CURRENT LIABILITIES</b>		
Breeding Livestock	_____	_____	Notes Payable, Non-Real Estate	_____	_____
Machinery & Equipment	_____	_____	Notes Payable, Real Estate	_____	_____
Vehicles	_____	_____	Deferred Taxes	_____	_____
Contracts & Notes Receivable	_____	_____	Other Non-Current Liabilities	_____	_____
Real Estate	_____	_____	<b>TOTAL NON-CURR. LIAB.</b>	_____	_____
Buildings & Improvements	_____	_____	<b>TOTAL LIABILITIES</b>	_____	_____
Other Non-Curr. Assets	_____	_____	(Current & Non-Current)	_____	_____
<b>TOTAL NON-CURR. ASSETS</b>	_____	_____	<b>NET WORTH</b>	_____	_____
			(Total Assets - Total Liab.)	_____	_____
<b>TOTAL ASSETS</b>	_____	_____	<b>TOTAL LIAB.+NET WORTH</b>	_____	_____
(Current & Non-Current)					

**WORKSHEET 3: MEASURING FINANCIAL & ECONOMIC PERFORMANCE**

		<u>Calculation</u>	<u>Answer</u>	<u>Database Results</u>
1. Investment Per Breeding Ewe =	$\frac{\text{Average Enterprise Asset Value}}{\text{Average No. of Breeding Ewes}}$	_____	_____	<u>Market Val.</u> 148 - 7,372 \$1,970
<i>Average Enterprise Asset Value</i>	=	$\frac{\text{Beg. Balance Sheet Asset Values} + \text{End. Balance Sheet Asset Values}}{2}$		<u>Cost Basis</u> 58 - 3,151 \$558
<i>Average Number Of Breeding Ewes</i>	=	$\frac{\text{Beginning Fiscal Year Inventory} + \text{ending Fiscal Year Inventory}}{2}$		
2. Debt Per Breeding Ewe =	$\frac{\text{Total Sheep Enterprise Liabilities}}{\text{Average No. of Breeding Ewes}}$	_____	_____	
<i>Total Sheep Enterprise Liabilities</i>	=	$\frac{\text{Beg. Balance Sheet Total Liabilities} + \text{End. Balance Sheet Total Liab.}}{2}$		
3. Percent Ownership =	$\frac{\text{Investment Per Breeding Ewe (minus) Debt Per Breeding Ewe}}{\text{Investment Per Breeding Ewe}}$	_____	_____	
4. Total Operating Cost Per Breeding Ewe =	$\frac{\text{Total Operating Cost}}{\text{Average No. of Breeding Ewes}}$	_____	_____	

*Total Operating Costs are those cash and non-cash expenses that the sheep enterprise should cover, including: Purchased Feed, Raised Feed, Grazing Property Taxes, Utilities, Insurance, Supplies, Fuel & Lube, Hired Labor, Repairs, Rents & Leases, Depreciation (buildings, equipment, machinery, livestock) and Other Sheep Enterprise Expenses.*  
*Note: Operating Costs do not include Financial (interest expense) or economic return (opportunity costs) to assets.*

*Total Feed Costs include purchased feed, raised feed, and adjustments for feed payable and feed inventory. Purchased Feed: Expenses for feed purchased and expense incurred when feeding. Raised Feed: Include expenses incurred for feed production and feeding (i.e., chemicals, fertilizers, seed, fuel & lube, labor, repairs, rents & leases, property taxes, machinery hire, depreciation, and other raised feed expenses).*  
*Adjustments for Feed Payable and Feed Inventory: Non-cash adjustments for feed purchased on credit and difference between ending and beginning feed inventories, respectively.*

**WORKSHEET 3: MEASURING FINANCIAL & ECONOMIC PERFORMANCE CONTINUED**

		<u>Calculation</u>	<u>Answer</u>	<u>Database Results</u>
6. Total Grazing Cost Per Breeding Ewe	=	$\frac{\text{Total Grazing Costs} + \text{Real Estate Cost}}{\text{Average No. of Breeding Ewes}}$	_____	_____
				0 - 27 \$11.68
<p><i>Grazing Costs: Include expenses related to the grazing activity (i.e. fencing, pasture and water improvements, etc.).</i></p> <p><i>Real Estate Costs: Include lease payments, real estate interest payments, depreciation, maintenance, property taxes, etc.).</i></p>				
7. Gross Revenue Per Breeding Ewe	=	$\frac{\text{Cash Revenue} + \text{Non-Cash Revenue}}{\text{Average No. of Breeding Ewes}}$	_____	_____
<p><i>Cash Revenue: Include cash receipts from sales of lamb, wool, gain or loss on sale of breeding stock, and other cash receipts.</i></p> <p><i>Non-Cash Revenue: Include change in beginning and ending inventories and accounts receivable for revenues earned.</i></p>				
8. Total Finance Cost Per Breeding Ewe	=	$\frac{\text{Interest Payments} + \text{Accrued Interest}}{\text{Average No. of Breeding Ewes}}$	_____	_____
<p><i>Interest Payments: Include actual interest paid on borrowed capital but do not include principle payments.</i></p> <p><i>Accrued Interest: Includes all interest that has accrued on borrowed capital but has not been paid.</i></p>				
9. Total Cost Per Breeding Ewe	=	$\frac{\text{Total Operating Cost} + \text{Total Finance Cost}}{\text{Average No. of Breeding Ewes}}$	_____	_____
				29 - 335 \$105
10. Total Operating Cost Per Breeding Ewe	=	Total Direct Oper. Cost + Total Indirect Oper. Cost + Total Finance Cost		

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