Returns on Ram Selection: a theoretical 10-year budget scenario to estimate financial return on selection for measureable economically important traits.

By Tom Stanley, Extension Agent, Farm Business Management

The attached budgets and tables attempt to illustrate the financial impact a focused sire-selection program can have on flock performance and financial returns. The author has attempted to describe a spring lambing sheep flock that is experiencing significant parasite pressure and has a genetic base with moderate to low growth rates. The analysis attempts to quantify the financial impacts that consistent application of selection standards over time. The analysis illustrates annual net income being improved by 14% when selecting for growth alone, 23% when selecting for lower fecal egg count alone, and 38% when sires are used that improve both growth and lower fecal egg count. Table 5 calculates the value each ram brings to the particular selection program.

The flock's financial performance in the first year of the selection program is illustrated in the complete enterprise budget that follows. The author has set flock size at 100 ewes since this makes the costs and returns a little easier to inspect at a glance since when looking at total costs for the flock- cost per ewe can be determined simply by moving the decimal two places. The budget assumes a ratio of 25 ewes to one ram. In the case of flocks smaller than 25 ewes or there are fewer ewes per ram the estimated returns to the shepherd for each ram selected will be lower.

These budget projections attempt to quantify the financial benefit that can be captured when heritable traits of economic importance can be quantitatively measured and sire selection based on these traits is consistently applied over time. Recent interest in sires rated for their fecal egg count and the success in improving parasite resistance through sire selection in Australia and New Zealand prompts us to explore the possible financial benefit from purchasing rams identified as having lower fecal egg counts.

There are limitations to this type of analysis. The heritability of the selected trait(s) and the number of traits that are simultaneously selected for impacts the rate of progress. The plethora of other management and environmental factors that impact costs and returns alter what a shepherd will actually experience. However, it is the type of analysis presented here that allows us to hold these other factors constant and hopefully isolate and observe the benefits that can be realized through sire selection. In this scenario, the flock in year one is composed of ewes with typical fecal egg counts and moderate to low growth rates, therefore there is 'room to improve'. Flocks that have already achieved high rates of growth or have high levels of parasite resistance are less likely to realize as much gain as is illustrated here.

Points to Remember:

1) This is a 'theoretical exercise' intended to illustrate the progress a shepherd can make with a flock that has potential to improve in both growth and parasite resistance.

2) The progress in flock performance described in these budget scenarios is accomplished exclusively through ram selection. It is assumed that the rams that have superior performance for growth and/or lower FEC are accurately identified. Much more rapid progress could be achieved if a shepherd also purchases replacement ewes that are superior in the performance areas described (growth and/or lower fecal egg count).

3) Genetic progress on a flock basis is a process of years and requires focus and planning. The more traits we attempt to improve, the slower the progress.

4) Aggressive selection for one trait often results in compromising on other traits.

Virginia Cooperative Extension

Shepherd's Symposium, January 2017

PUBLICATION 446-047

COMPLETE ENTERPRISE BUDGET, YEAR 1 OF SIRE SELECTION SCENARIO

				100	EWES	\$8,837.48	=Net Income		
170%	LAMB CRO	P		4 1	RAMS	100%	OF LAMBS FINI	SHED WITH PUR	CHASED FEE
20%	LAMB Dea	th Loss		20%	CULLS	40	WEANING WEIG	HT (LBS)	
1.36	= Lambs Ra	aised per Ev	ve	0.50	ADG		TO 1 POST WE	. ,	VERSION
ITEM	HEAD	1	CWT	UNIT	PRICE		QUANTITY	TOTAL	Your Farm
1. GROSS RECEIPTS		20% Per	cent of La	mbs Unthrify		\$/hd			
Good Lambs	94	@	1.10	Cwt	\$200.00	220.00	102.96	\$20,592.00	
Unthrifty Lambs	23	@	0.65	Cwt	\$230.00	149.50	15.21	\$3,498.30	
Cull Ewes	16	@	1.50	Cwt	\$90.00		24.00	\$2,160.00	
Cull Ram	1	@	2.00	Cwt	\$80.00		2.00	\$160.00	
Wool			6.50	Lbs/Head	\$0.80		669.50	\$535.60	
2. TOTAL GROSS RECEI	PTS					\$269.46	Per Ewe	\$26,945.90	
3. VARIABLE COSTS									
		Ect	Acres=	52.55					
	Feed Loss		10105=	52.55					
Alfalfa Hay	5.0%	.,,		Ton	\$135.00		5.50	\$742.49	
1st cutting grass hay	20.0%			Ton	\$50.00		0.00	\$0.00	
2nd cutting grass hay	5.0%	1.50	10.22	Ton	\$180.00		15.33	\$2,759.40	
Stkpld Fescue DM	15.0%	3.00	8.91	Ton	\$20.00		26.72	\$534.46	
Pelleted Supplement	2.0%			Ton	\$275.00		13.73	\$3,774.69	
Corn	2.0%			Ton	\$175.00		12.03	\$2,104.69	
		Lbs per				_			
Flush Ewes	0.5	Ewe	21	days	\$400.00	per Ton	0.53	\$210.00	
Perinneal Alf/Grass DM	15.0%	4.00	11.19	Ton	\$20.00		44.75	\$895.02	
Summer Annual DM	15.0%	3.50	1.23	Ton	\$20.00		4.31	\$86.25	
Winter Annual DM	15.0%	2.00	0.00	Ton	\$20.00		0.00	\$0.00	
Grinding & Mixing		Cwt		Cwt	\$0.00		0.00	\$0.00	
Salt & Mineral		Lbs per Ew	e	Cwt	\$20.00		19.58	\$391.64	
Vet & Medicine	~	\$/Head		Head Head	\$7.57		100 104	\$756.78	
Shearing & Wool Handlin	ig			Head	\$6.00		104	\$624.00 \$500.00	
Supplies Electric Netting				Rolls	\$5.00 \$125.00		100	\$500.00 \$500.00	
Replacement Ram				Head	\$600.00		4	\$600.00	
Synchronize ewes				Head	\$0.00		100	\$0.00	
Stockpiled Pasture	0.00	Acres per E	we	Acre	\$51.00		0	\$0.00	
Pasture		Acres per E		Acre	\$12.00		35	\$420.00	
Haul Cull Sheep	0.00		-	Head	\$2.00		17	\$34.00	
Market Cull Sheep	12	\$/Head		Head	\$7.09		17	\$204.00	
Haul Sheep		_		Head	\$3.00		93.6	\$280.80	
Market Sheep	12	\$/Head		Head	\$9.60		93.6	\$1,123.20	
Virginia Check-off		-		Head	\$0.50		134	\$67.00	
Building & Fence Repairs				Head	\$12.00		100	\$1,200.00	
Utilities				Head	\$0.90		100	\$90.00	
Bedding	8	Lbs per Ew	е	Ton	\$80.00		0.4	\$32.00	
Machinery (Non-Crop)				Head	\$1.78		100	\$178.00	
Land Rental				Acre/Year	\$0.00		35	\$0.00	
Labor		Hours per V	Veek	Hours	\$0.00		0	\$0.00	
Operating Interest	12	Months		Dollars	0.00%	•	\$ 16,466	\$0.00	
4. TOTAL VARIABLE CO	STS					\$181.08	Per Ewe	\$18,108.42	
5. ANNUAL DEBT PAYM	ENTS							\$0.00	
6. PROJECTED NET RET	URN TO EC	QUITY, MAN	AGEMEN	T, & FAMILY	LABOR	\$88.37	Per Ewe	\$8,837.48	

Table 1.			Projected I	Returns Wh	en Level of	Performan	ce Remains	Constant		
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
% Lamb Crop	170	170	170	170	170	170	170	170	170	170
% of Lamb Death Loss	20	20	20	20	20	20	20	20	20	20
% of Lamb Crop Unthrifty										
but marketed	20	20	20	20	20	20	20	20	20	20
% Culling Rate	20	20	20	20	20	20	20	20	20	20
Weaning Weight	40	40	40	40	40	40	40	40	40	40
Days on Feed	140	140	140	140	140	140	140	140	140	140
Avg Daily Gain	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
Annual Drenches*	797	797	797	797	797	797	797	797	797	797
Annual Drench Cost	\$ 119.35	\$ 119.35	\$ 119.35	\$ 119.35	\$ 119.35	\$ 119.35	\$ 119.35	\$ 119.35	\$ 119.35	\$ 119.35
Total Cost / Ewe	\$ 197.14	\$ 197.14	\$ 197.14	\$ 197.14	\$ 197.14	\$ 197.14	\$ 197.14	\$ 197.14	\$ 197.14	\$ 197.14
Return / Ewe	\$ 73.37	\$ 73.37	\$ 73.37	\$ 73.37	\$ 73.37	\$ 73.37	\$ 73.37	\$ 73.37	\$ 73.37	\$ 73.37
Net Present Value of Inco years:	me Stream	per Ewe ove	er 10	\$625.86						
*Annual Drenches = Total	number of t	imes a de-w	vorming dre	nch is admi	nistered to	either a she	ep or a lam	b	1	
Scenario Assumptions:						Essential P	erformance	Benchmar	ks:	
Spring Lambing Flock with	high narasit	e load				Lambing Pe				
100 ewes, 4 rams, one ram						Ewe Cull Ra				
Management Uses FAMAC	-	-	isions			Lamb Deat				
Healthy Lambs weigh 110								vive to be r	narketed bi	ut are poor quality)
Unthrifty Lambs weigh 65			· · · · · · · · · · · · · · · · · · ·			Weaning W				
No labor, land rent, or inte						•	per of Times	S Drench Ad	ministered	
Interest Rate for Net Prese	0		-	3.00%		Avg Daily G	iain by Laml	os on Feed		

Table 2.		Projected I	Returns Wh	ien Ram Sel	ection Focu	ses On Gro	wth				
											% Change
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Yr10 vs Yr 1
% Lamb Crop	170	170	170	170	170	170	170	170	170	170	0%
% Death Loss	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	0%
% Unthrifty Lambs	20	20	20	18	18	18	18	18	18	18	-10%
% Culling Rate	20	20	20	20	20	20	20	20	20	20	0%
Weaning Weight	40	40	45	45	47	47	50	52	55	55	38%
Days on Feed	140	133	118	118	110	105	92	89	81	79	-44%
Avg Daily Gain	0.500	0.525	0.550	0.550	0.575	0.600	0.650	0.650	0.675	0.700	40%
Annual Drenches*	797	797	797	797	797	797	797	797	797	797	0%
Annual Drench Cost	\$ 119.35	\$ 119.35	\$ 119.35	\$ 119.35	\$ 119.28	\$ 119.28	\$ 119.28	\$ 119.28	\$ 119.28	\$ 119.28	0%
Total Cost / Ewe	\$ 181.08	\$ 178.97	\$ 174.90	\$ 173.28	\$ 184.39	\$ 182.03	\$ 176.96	\$ 175.15	\$ 172.45	\$ 170.38	-6%
Return / Ewe	\$ 88.37	\$ 90.49	\$ 94.56	\$ 97.82	\$ 86.71	\$ 89.08	\$ 94.15	\$ 95.95	\$ 98.66	\$ 100.72	14%
Net Present Value of Inc											
ten years of intense sele *Annual Drenches = Tota	ection:	imes a de-v	vorming dre	\$796.82 ench is admi	inistered to	either a she	ep or a lam	b		-	
ten years of intense sele	ection:	imes a de-v	vorming dre		inistered to	either a she	ep or a lam	b		-	
ten years of intense sele	ection:			ench is admi	inistered to					-	
ten years of intense sele *Annual Drenches = Tota	ection: al number of t	Projected I	Returns Wh	ench is admi	ection Focu	ses On Low	er Fecal Eg	g Count.		-	% Change
ten years of intense sele *Annual Drenches = Tota Table 3.	ection: al number of t Year 1	Projected I Year 2	Returns Wh	ench is admi	ection Focu Year 5	ses On Low Year 6	er Fecal Eg Year 7	g Count. Year 8	Year 9	Year 10	Yr10 vs Yr 1
ten years of intense sele *Annual Drenches = Tota	ection: al number of t	Projected I	Returns Wh	ench is admi	ection Focu Year 5 170	ses On Low	er Fecal Eg	g Count.	Year 9 170	Year 10 170	Yr10 vs Yr 1
ten years of intense sele *Annual Drenches = Tota Table 3.	ection: al number of t Year 1	Projected I Year 2	Returns Wh	ench is admi	ection Focu Year 5	ses On Low Year 6	er Fecal Eg Year 7	g Count. Year 8			-
ten years of intense sele *Annual Drenches = Tota Table 3. % Lamb Crop % Death Loss % Unthrifty Lambs	ection: al number of t Year 1 170	Projected I Year 2 170 20 20	Returns Wh Year 3 170 18 18	Year 4 170 18 18	ection Focu Year 5 170 16 16	ses On Low Year 6 170 14 15	er Fecal Egg Year 7 170 13 13	year 8 170 12 11	170 10 9	170 10 7	Yr10 vs Yr 1 09 -509 -659
ten years of intense sele *Annual Drenches = Tota Table 3. % Lamb Crop % Death Loss	ection: al number of t Year 1 170 20	Projected I Year 2 170 20	Returns Wh Year 3 170 18	Year 4 170 18	ection Focu Year 5 170 16	ses On Low Year 6 170 14	er Fecal Egg Year 7 170 13	y Count. Year 8 170 12	170 10	170 10	Yr10 vs Yr 1 09 -509
ten years of intense sele *Annual Drenches = Tota Table 3. % Lamb Crop % Death Loss % Unthrifty Lambs	ection: al number of t Year 1 170 20 20	Projected I Year 2 170 20 20	Returns Wh Year 3 170 18 18	Year 4 170 18 18	ection Focu Year 5 170 16 16	ses On Low Year 6 170 14 15	er Fecal Egg Year 7 170 13 13	year 8 170 12 11	170 10 9	170 10 7	Yr10 vs Yr 1 09 -509 -659 -259
ten years of intense sele *Annual Drenches = Tota Table 3. % Lamb Crop % Death Loss % Unthrifty Lambs % Culling Rate	ection: al number of t Year 1 170 20 20 20 20	Projected I Year 2 170 20 20 20	Returns Wh Year 3 170 18 18 20	Year 4 170 18 18 20	ection Focu Year 5 170 16 16 18	Ses On Low Year 6 170 14 15 16	er Fecal Egg Year 7 170 13 13 13	year 8 170 12 11 15	170 10 9 15	170 10 7 15	Yr10 vs Yr 1 09 -509 -659
ten years of intense sele *Annual Drenches = Tota Table 3. % Lamb Crop % Death Loss % Unthrifty Lambs % Culling Rate Weaning Weight	ection: al number of t Year 1 170 20 20 20 20 40	Projected I Year 2 170 20 20 20 20 40	Returns Wh Year 3 170 18 18 20 39	Year 4 170 18 18 20 39	ection Focu Year 5 170 16 16 18 38	ses On Low Year 6 170 14 15 16 37	er Fecal Egg Year 7 170 13 13 13 37	year 8 170 12 11 15 37	170 10 9 15 37	170 10 7 15 36	Yr10 vs Yr 1 09 -509 -659 -259 -109 329
ten years of intense sele *Annual Drenches = Tota Table 3. % Lamb Crop % Death Loss % Unthrifty Lambs % Culling Rate Weaning Weight Days on Feed	ection: al number of t Year 1 170 20 20 20 20 40 140	Projected I Year 2 170 20 20 20 40 140	Year 3 170 18 20 39 149	Pench is admi en Ram Sel Year 4 170 18 18 20 39 158	ection Focu Year 5 170 16 16 18 38 169	Year 6 170 14 15 16 37 172	Year 7 170 13 13 13 37 183	year 8 170 12 11 15 37 183	170 10 9 15 37 183	170 10 7 15 36 185	Yr10 vs Yr 1 09 -509 -659 -259 -109 329 -209
ten years of intense sele *Annual Drenches = Tota Table 3. % Lamb Crop % Death Loss % Unthrifty Lambs % Culling Rate Weaning Weight Days on Feed Avg Daily Gain	ection: al number of t Year 1 170 20 20 20 20 40 140 0.500	Projected I Year 2 170 20 20 20 40 140 0.500	Returns Wh Year 3 170 18 18 20 39 149 0.475	Year 4 170 18 18 20 39 158 0.450	ection Focu Year 5 170 16 16 18 38 169 0.425	ses On Low Year 6 170 14 15 16 37 172 0.425	Year 7 170 13 13 13 37 183 0.400 378	year 8 170 12 11 15 37 183 0.400	170 10 9 15 37 183 0.400 219	170 10 7 15 36 185 0.400	Yr10 vs Yr 1 09 -509 -659 -259 -109 329 -209 -759
ten years of intense sele *Annual Drenches = Tota Table 3. % Lamb Crop % Death Loss % Unthrifty Lambs % Culling Rate Weaning Weight Days on Feed Avg Daily Gain Annual Drenches*	ection: al number of t Year 1 170 20 20 20 20 40 140 0.500 797	Projected I Year 2 170 20 20 20 20 40 140 0.500 797	Year 3 170 18 20 39 149 0.475 618	Pench is admi en Ram Sel Year 4 170 18 18 20 39 158 0.450 598	Pection Focu Year 5 170 16 18 38 169 0.425 412	Ses On Low Year 6 170 14 15 16 37 172 0.425 396	er Fecal Egg Year 7 170 13 13 13 37 183 0.400 378	Year 8 170 12 11 15 37 183 0.400 220	170 10 9 15 37 183 0.400 219 \$ 34.83	170 10 7 15 36 185 0.400 198	Yr10 vs Yr 1 09 -509 -659 -259 -109

Net Present Value of Income Stream per Ewe over the first				
ten years of intense selection:	\$811.31			
*Annual Drenches = Total number of times a de-worming dre	nch is administered to	either a sheep or a lam	b	

Table 4.		Projected I	Returns Wh	en Ram Sel	ection Focu	ses On Both	n Growth A	nd Lower Fe	ecal Egg Cou	unt.	
											% Change
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Yr10 vs Yr 1
% Lamb Crop	170	170	170	170	170	170	170	170	170	170	0%
% Death Loss	20	20	19	18	17	17	16	15	12	11	-45%
% Unthrifty Lambs	20	19	18	17	17	17	16	15	12	11	-45%
% Culling Rate	20	20	20	20	18	17	16	15	15	15	-25%
Weaning Weight	40	40	42	42	43	45	45	47	48	49	23%
Days on Feed	140	140	136	130	122	118	118	110	103	102	-27%
Avg Daily Gain	0.500	0.500	0.500	0.525	0.550	0.550	0.550	0.575	0.600	0.600	20%
Annual Drenches	797	797	802	806	566	565	567	569	567	570	-28%
Annual Drench Cost	\$ 119.35	\$ 119.35	\$ 119.91	\$ 120.47	\$ 88.96	\$ 87.88	\$ 87.22	\$ 86.56	\$ 87.04	\$ 87.46	-27%
Total Cost / Ewe	\$ 181.08	\$ 181.26	\$ 180.61	\$ 181.79	\$ 196.46	\$ 191.73	\$ 192.87	\$ 191.99	\$ 194.59	\$ 192.20	6%
Return / Ewe	\$ 88.37	\$ 89.02	\$ 92.57	\$ 96.38	\$ 88.68	\$ 94.15	\$ 96.71	\$ 103.41	\$ 114.14	\$ 121.73	38%
Net Present Value of Incor ten years of intense select	ion:	-		\$833.74							
*Annual Drenches = Total	number of t	times a de-v	vorming dre	ench is admi	nistered to	either a she	ep or a lam	b			
Table 5.											
					Net Presen	t Value of ir	ncome	Dollars del	ivered to th	e shepherd	by each ram
		Net Presen	t Value of Ir	ncome		ewe, multi				•	'grade ram'
		Stream per	ewe over 1	0-year	-	pread acros	-				either growth
System/Description			ire selectior	-	rams*	•		or fecal eg	•		-
Flock Maintains Level Perfo	ormance		\$625.86			\$6,258.60				\$0.00	
De ma e de stad fan Crea	uth and a		6706.00			ć7.000.00			Ċ4	700.00	
Rams are selected for Grov	wth only		\$796.82			\$7,968.20			\$1	,709.60	
Rams are selected for Low	FEC only		\$811.31			\$8,113.10			\$1	,854.50	
Rams are selected for both	Low FEC										
and Growth			\$833.74			\$8,337.40			\$2	,078.80	
					*2.5 rams =	= 10 year pe	riod with a				
					new ram ir	ntroduced ev	very 4	**based or	n 25 ewes p	er ram, new	ram every 4
					years		-	years			-

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The flock's complete costs and returns in the first year of the selection program is illustrated in the itemized enterprise budget that follows. The author has set flock size at 100 ewes since this makes the costs and returns a little easier to inspect at a glance since when looking at total costs for the flock- cost per ewe can be determined simply by moving the decimal two places. The budget assumes a ratio of 25 ewes to one ram. In cases where there are fewer than 25 ewes per ram the estimated returns to the shepherd for each ram selected will be lower.

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Shepherd's Symposium, January 2017

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	= Lambs R		we		ADG			ANING FEED CO	VERSION
ITEM	HEAD)	CWT	UNIT	PRICE		QUANTITY	TOTAL	Your Farm
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		Es	l. Acres≈	52.55					
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Winter Annual DM	15.0%	2.00	0.00	Ton	\$20.00		0.00	\$0.00	
Grinding & Mixing		Cwt		Cwt	\$0.00		0.00	\$0.00	
Salt & Mineral		Lbs per Ew	ie.	Cwt	\$20.00		19.58	\$391.64	
Vet & Medicine		\$/Head		Head	\$7.57		100	\$756.78	
Shearing & Wool Handlin)g			Head	\$6.00		104	\$624.00	<i></i>
Supplies				Head	\$5.00		100	\$500.00	
Electric Netting				Rolls	\$125.00		4	\$500.00	
Replacement Ram				Head	\$609.00		1	\$600.00	
Synchronize ewes				Head	\$0.06		100	\$0.00	
Stockpiled Pasture		Acres per l		Acre	\$51.00		0	\$0.00	
Pasture	0.35	Acres per l	Êwe	Acre	\$12.00		35	\$420.00	
Haul Cull Sheep				Head	\$2,60		17	\$34.00	
Market Cull Sheep	12	\$/Head		Head	\$7.09		17	\$204.00	
Haui Sheep				Head	\$3.00		93.6	\$280.80	
Market Sheep	12	\$/Head		Head	\$9.60		93.6	\$1,123.20	
Virgínia Check-off				Head	\$0.50		134	\$67.00	
Building & Fence Repairs				Head	\$12.00		100	\$1,200.00	
Utilities				Head	\$0.90		100	\$90.00	
Bedding	8	Lbs per Ew	0	Ton	\$80.00		0.4	\$32.00	
Machinery (Non-Crop)				Head	£1.78		100	\$178.00	
Land Rental				Acre/Year	\$0.00		35	\$0.00	
Labor		Hours per I	Neek	Hours	\$0.00		0	\$0.00	
Operating Interest	12	Months		Dollars	0.00%		\$ 16,466	\$0.00	
4. TOTAL VARIABLE CO	STS					\$181.08	Per Ewe	\$18,108.42	
5. ANNUAL DEBT PAYMI	INTS							\$0.00	
6. PROJECTED NET RET	URN TO EG	UITY, MAN	AGEMEN	F, & FAMILY	LABOR	\$88.37	Per Ewe	\$8,837.48	

Year 3 Year 4 Year 5 Year 6 Year 7 Year 8 Year 9 Y 170 170 170 170 170 170 170 170 170 20	Table 1.			Projected	Projected Returns When Level of Performance Remains Constant	en Level of	Performan	ce Remains	Constant		
Year 3Year 4Year 5170170170170170170201401401401401401400.5000.5000.5000.5000.5000.5000.5000.5000.5000.5000.5000.500110.35\$ 119.35\$ 119.35\$ \$ 181.08\$ 181.08\$ 181.08\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	инститителя и т	· · · · · · · · · · · · · · · · · · ·							1000 A		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		Year 1	Year 2	a	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	% Lamb Crop	170	170	170	170	170	170	170	170	170	170
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	% of Lamb Death Loss	20	20	20	20	20	20	20	20	20	20
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	% of Lamb Crop Unthrifty)
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	but marketed	20	20	20	20	20	20	20	20	20	20
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	% Culling Rate	20	20	20	20	20	20	20	20	20	20
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	Weaning Weight	40	40	40	40	40	40	40	40	40	40
0.500 0.500 0.500 797 797 797 797 797 797 5 119.35 \$ 119.35 5 5 119.35 \$ 119.35 5 5 119.35 \$ 119.35 5 5 181.08 \$ 181.08 5 \$ 181.08 \$ 181.08 5 \$ 88.37 \$ 88.37 ver \$ \$ 88.37 \$ 88.37 ver \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Days on Feed	140	140	140	140	140	140	140	140	140	140
797 797 797 797 5 5 119.35 5 119.35 5 5 119.35 5 119.35 5 5 119.35 5 119.35 5 5 119.35 5 119.35 5 5 181.08 5 181.08 5 88.37 5 88.37 5 6 88.37 5 88.37 5 7 5 88.37 5 88.37 7 5 88.37 5 88.37 8 5 88.37 5 88.37 6 5 5 38.31 5 8 5 5 38.31 5 8 5 5 38.31 5 8 5 5 38.31 5 8 5 5 3 5 8 5 5 5 5 8 5 5 5 8 5 5 5 8 5 5 5 9 5 5 5 6 5 5 5	Avg Daily Gain	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
i \$ 119.35 \$ 119.35 \$ 119.35 i \$ 181.08 \$ 181.08 \$ 181.08 i \$ 88.37 \$ 88.37 \$ 88.37 ver \$ 88.37 \$ 88.37 \$ 88.37 ver \$ 5 \$ 88.37 \$ 88.37 ver \$ 5753.81 \$ 88.37 worming drench is administered to ench is administered to en	Annual Drenches*	797	797	797	797	797	797	797	797	797	797
8 \$ 181.08 \$ 181.08 \$ 181.08 \$ \$ 88.37 \$ 88.37 \$ 88.37 \$ \$ 88.37 \$ 88.37 \$ 88.37 \$ \$ 88.37 \$ 88.37 \$ 88.37 \$ \$ 88.37 \$ 88.37 \$ 88.37 \$ \$ 58.37 \$ 88.37 \$ 88.37 \$ \$ 5753.81 \$ 58.37 \$ \$ 88.37 worming drench is administered to classes \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Annual Drench Cost	\$ 119.35	\$ 119.35	\$ 119.35						1	
\$ 88.37 \$ 88.37 \$ 88.37 ver 10 \$753.81 \$ worming drench is administered to claions \$ \$ g \$2.30/lb g \$2.30/lb \$	Total Cost / Ewe	\$ 181.08	\$ 181.08	\$ 181.08					1		\$ 181.08
ver 10 \$753.81 \$753.81 worming drench is administered to each second sec	Return / Ewe	\$ 88.37	\$ 88.37	\$ 88.37	88			1	88		1
ver 10 \$753.81 \$753.81 worming drench is administered to claim the second state of the											
worming drench is administered to a worming drench is administered to a second	Net Present Value of Incor	ne Stream I	oer Ewe ove	er 10							
worming drench is administered to a difference of the differen	years:				\$753.81						
cisions lg \$2.00 / lb dget	*Annual Drenches = Total r	number of t	imes a de-w	vorming dre	nch is admin	nistered to	either a she	eo or a laml			
cisions (g \$2.00 / lb g \$2.30 / lb dget											
cisions ig \$2.00 / lb g \$2.30 / lb dget	Scenario Assumptions:						Essential Pe	erformance	Benchmark	ts That Chai	nge:
cisions (1) (1) (1) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2	Spring Lambing Flock with I	nigh parasit	e load.				Ewe Cull Ra	te			
cisions 1g \$2.00 / lb g \$2.30 / lb dget	100 ewes, 4 rams, one ram	purchased	annually				Lamb Death	1 Loss			
lg \$2.00 / lb g \$2.30 / lb dget	Management Uses FAMACI	HA for dewo	orming deci	sions			% Unthriftv	Lambs (sur	vive to he m	arketed hu	t are noor quality)
g \$2.30 / lb dget	Healthy Lambs weigh 110 ll	os at marke	t, and bring	; \$2.00 / lb			Weaning W	'eight		5 5	
dget	Unthrifty Lambs weigh 65 ll	os at marke	t and bring				Total Numb	er of Times	Drench Adr	ninistered	No. Annual Annua Annual Annua Annual Annua Annual Annual Annu
	No labor, land rent, or inter	est charges	in this bud	get			Avg Daily G	ain by Lamb	s on Feed		
Pred Efficiency (Growth Sire Only, not printed in tables)	Interest Rate for Net Preser	nt Value Cal	culations:		3.00%		Feed Efficie	ncy (Growth	1 Sire Only, 1	not printed	in tables)

Table 2.		Projected Return	Returns Wh	en Ram Seli	ection Focu	is When Ram Selection Focuses On Growth	vth				
					1						% Change Yr10
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	vs Yr 1
% Lamb Crop	170	170	170	170	170	170	170	170	170	170	%0
% Death Loss	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	%0
% Unthrifty Lambs	20	20	20	18	18	18	18	18	18	18	-10%
% Culling Rate	20	20	20	20	20	20	20	20	20	20	0%
Weaning Weight	40	40	45	45	47	47	50	52	55	55	38%
Days on Feed	140	133	118	118	110	105	92	89	81	67	-44%
Avg Daily Gain	0.500	0.525	0.550	0.550	0.575	0.600	0.650	0.650	0.675	0.700	40%
Annual Drenches*	797	197	797	797	797	797	797	797	797	797	0%0
Annual Drench Cost	\$ 119.35	\$ 119.35	\$ 119.35	\$ 119.35	\$ 119.28	\$ 119.28	\$ 119.28	\$ 119.28	\$ 119.28	\$ 119.28	%0
Total Cost / Ewe	\$ 181.08	\$ 178.97	\$ 174.90	\$ 173.28	\$ 184.39	\$ 182.03	\$ 176.96	\$ 175.15	\$ 172.45	\$ 170.38	-6%
Return / Ewe	\$ 88.37	\$ 90.49	\$ 94.56	\$ 97.82	\$ 86.71	\$ 89.08	\$ 94.15	\$ 95.95	\$ 98.66	\$ 100.72	14%
Net Present Value of Income Stream per Ewe over the	come Stream	per Ewe ovi	er the first								
ten years of intense selection:	sction:			\$796.82							
*Annual Drenches = Total number of times a de-worming drench is administered to either a sheep or a lamb	al number of t	times a de-v	vorming dre	nch is admin	nistered to	either a shee	ap or a lami				
		c S	ć		ŀ			4			% Change Yruu
		Year Z	Year 3		Year 5			Year 8	Year 9	Year 10	vs Yr 1
% Lamb Crop	170	170	170	170	170	170	170	170	170	170	%0
% Death Loss	20	20	18	18	16	14	13	12	10	10	-50%
% Unthrifty Lambs	20	20	18	18	16	15	13		6	7	-65%
% Culling Rate	20	20	20	20	18	16	13	15	5	15	-25%
Weaning Weight	40	40	39	39	38	37	37	37	37	36	-10%
Days on Feed	140	140	149	158	169	172	183	183	183	185	32%
Avg Daily Gain	0.500	0.500	0.475	0.450	0.425	0.425	0.400	0.400	0.400	0.400	-20%
Annual Drenches*	797	797	618	598	412	396	378	220	219	198	-75%
Annual Drench Cost	I \$ 119.35	\$ 119.35	\$ 93.37	\$ 86.70	\$ 67.40	\$ 61.52	\$ 55.05	\$ 34.55	\$ 34.83	\$ 30.78	-74%
Total Cost / Ewe	\$ 181.08	\$ 181.08	\$ 183.71	\$ 183.67	\$ 202.99	206.68	\$ 208.00	\$ 209.32	(\land)	\$ 213.57	18%
Return / Ewe	\$ 88.37	\$ 88.37	\$ 93.62	\$ 93.66	\$ 85.12	\$ 92.17	\$ 98.43				23%
Net Present Value of Income Stream per Ewe over the first	ome Stream F	ser Ewe ove	er the first			и					
ten years of intense selection:	ction:			\$811.31				ан ж ана с		***********	
*Annual Drenches = Total number of times a de-wormin	I number of ti	imes a de-w	vorming drei	nch is admir	nistered to (g drench is administered to either a sheep or a lamb	p or a lamk	(

Table 4.		Projected F	leturns Wh	en Ram Sel	Projected Returns When Ram Selection Focuses On Both Growth And Lower Fecal Egg Count.	ses On Both	1 Growth Ar	nd Lower Fe	ecal Egg Cou	int.	
	;									·	% Change
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Yr10 vs Yr 1
% Lamb Crop	170	170	170	170	170	170	170	170	170	170	%0
% Death Loss	20	20	19	18	17	17	16	15	12	11	-45%
% Unthrifty Lambs	20	19	18	17	17	17	16	15	12	11	-45%
% Culling Rate	20	20	20	20	18	17	16	15	15	15	-25%
Weaning Weight	40	40	42	42	43	45	45	47	48	49	23%
Days on Feed	140	140	136	130	122	118	118	110	103	102	-27%
Avg Daily Gain	0.500	0.500	0.500	0.525	0.550	0.550	0.550	0.575	0.600	0.600	20%
Annual Drenches	797	797	802	806	566	565	567	569	567	570	-28%
Annual Drench Cost	\$ 119.35	\$ 119.35	\$ 119.91	\$ 120.47	\$ 88.96	\$ 87.88	\$ 87.22	\$ 86.56	\$ 87.04	\$ 87.46	-27%
Total Cost / Ewe	<u> </u>	\$ 181.26	\$ 180.61	\$ 181.79	\$ 196.46	\$ 191.73	\$ 192.87	\$ 191.99	\$ 194.59	\$ 192.20	6%
Return / Ewe	\$ 88.37	\$ 89.02	\$ 92.57	\$ 96.38	\$ 88.68	\$ 94.15	\$ 96.71	\$ 103.41	\$ 114.14	\$ 121.73	38%
Net Present Value of Income Stream per Ewe over the first	me Stream p	oer Ewe ove	r the first								
ten years of intense selection:	tion:			\$833.74					981-59		
*Annual Drenches = Total number of times a de-worming drench is administered to either a sheep or a lamb	number of ti	imes a de-w	orming drei	nch is admin	nistered to e	either a shee	ep or a lamb				
Table 5.											
• • • • • • • • • • • • • • • • • • •		Net Present Value of Income	. Value of In	emoy	Net Present Value of income stroom or out multiplied by Jr	Value of in		Dollars deliv	vered to the	Dollars delivered to the shepherd by each ram	y each ram
System/Description		Stream per ewe period of sire sel	ewe over 10-year e selection		ewes and spread across 2.5 rams*	read across		auove what v not improve 1 egg count.**	. will be real e the flock ii *	above what will be realized if off a ram that do not improve the flock in either growth or fecal egg count.**	addre what will be realized from a ram that does not improve the flock in either growth or fecal egg count.**
Flock Maintains Level Performance	ormance		\$753.81			\$7,538.10			Ş	\$0.00	
Rams are selected for Growth only	wth only	19,499,9,1000000000000000000000000000000	\$796.82			\$7,968.20			\$4	\$430.10	NGT 11 1 2 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1
Rams are selected for Low FEC only	FEC only		\$811.31			\$8,113.10	**		\$2	\$575.00	
Rams are selected for both Low FEC and Growth	D Low FEC		\$833.74		.,	\$8,337.40			Ş	\$799.30	Afternerven annan a faith an anna ann
					*2.5 rams = 10 year period with a new ram introduced every 4	10 year peri roduced eve	/ith a	**based on	25 ewes pe	**based on 25 ewes per ram, new ram every 4	am everv 4
					years		~	years			