



Current Report

Cooperative Extension Service • Division of Agriculture • Oklahoma State University

Programmable Calculator DECISION MAKER SERIES

LIVESTOCK COSTS AND RETURNS ANALYSIS

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Cost and returns budgeting is an essential part of livestock management decision making. Livestock producers often talk about trying to "pencil a profit" from a cattle feeding or ranching operation. Most would admit that it is often easier to "pencil a profit" than actually make that money feeding cattle or running stock cattle. But, this illustrates a very important point. If a livestock producer cannot pencil out a profit using an enterprise budget, he or she likely has little chance of actually making a profit from that enterprise.

Effective enterprise decision making depends on a logical approach to the decision process. First, it is important to determine overall objectives that are consistent with existing resources of the livestock operation. In other words, the producer has to be realistic concerning expected returns to land, labor, capital, and management resources. Next, comes the budgeting process. Budgeting ultimately affects enterprise combinations and levels of production which show the greatest promise of achieving overall objectives. Budgeting is a systematic method of evaluating alternative outcomes of alternative decisions.

Each producer faces a unique production situation. His or her land, labor, capital, and management resources are different from that of other producers. Base budgets that represent costs and returns from similar operations may be quite useful. But, livestock producers must be able to "tailor" base budgets to their own particular situation if they are to make wise choices among enterprise alternatives.

Each budgeted situation has a wide range of possible outcomes. A producer should start with most likely gains, costs, prices, etc., but, also must recognize that there is a wide range of possible outcomes. Adverse growing conditions can affect calf crops, gains, and death losses. Input costs cannot always be predetermined. And, market prices are always a major uncertainty for livestock producers.

Most producers would likely have little difficulty in estimating a single set of costs and

returns. But, most also realize that no single set is adequate for production decision making purposes. And, calculation of a sufficient number of budgets to be of maximum value has simply seemed too great a task to tackle. But now, programmable calculators have made multiple budget revisions quick and easy, thus making enterprise budgets more useful tools for decision making.

The following livestock feeding cost and returns analysis program is designed for use on a Texas Instruments TI-59 calculator with printer. It is designed to be used for preparing quick modifications of existing OSU representative livestock feeding budgets. (Stocker budgets can also be modified. Pasture costs can be included as a feed item.) For example, the consequences of OSU most likely, optimistic, and pessimistic projected slaughter prices can be easily estimated. The program will calculate total returns, total operating costs, returns above operating costs, breakeven price necessary to cover operating costs, returns above all indicated costs, breakeven price necessary to cover all indicated costs, breakeven purchase price, costs of net gain, and the costs of items other than feed and feeder animal.

Input required

	<u>STORAGE REGISTER</u>	<u>LABELS</u>
1. Beginning weight, pay weight of animal (cwt.)	01	BGWT
2. Beginning price, purchase price (\$/cwt.)	02	BGPR
3. Interest rate (%/100)	03	INTR
4. Days owned (days)	04	DAYS
5. Labor (\$/hd)	05	LABR
6. Death loss as percent of beginning value (%/100)	06	D.L.
7. Marketing costs, hauling, commission, etc. (\$/hd)	07	MKTG
8. Veterinary, medical, and miscellaneous costs (\$/hd)	08	VETM
9. Fixed costs (\$/hd)	09	FIXD
10. Net finishing or selling weight (cwt.)	10	FNWT
11. Net selling price (\$/cwt.)	11	FNPR

12. Profit objective (\$/cwt.)	12	πOBJ
13. Feed one, quantity (unit)	13	FD1Q
14. Feed one, price (\$/unit)	14	FD1P
15. Feed two, quantity (unit)	15	FD2Q
16. Feed two, price (\$/unit)	16	FD2P
17. Feed three, quantity (unit)	17	FD3Q
18. Feed three, price (\$/unit)	18	FD3P
19. Feed four, quantity (unit)	19	FD4Q
20. Feed four, price (\$/unit)	20	FD4P

Fixed costs	(\$/hd)	FIXD	0	STO 09
Net finishing or selling weight	(cwt.)	FNWT	10.5	STO 10
Net selling price	(\$/cwt.)	FNPR	75	STO 11
Profit objective	\$/cwt.)	πOBJ	0	STO 12
Feed one, quantity	(unit)	FD1Q	2617.49	STO 13
Feed one, price	(\$/unit)	FD1P	.07	STO 14
Feed two, quantity	(unit)	FD2Q	0	STO 15
Feed two, price	(\$/unit)	FD2P	0	STO 16
Feed three, quantity	(unit)	FD3Q	0	STO 17
Feed three, price	(\$/unit)	FD3P	0	STO 18
Feed four, quantity	(unit)	FD4Q	0	STO 19
Feed four, price	(\$/unit)	FD4P	0	STO 20

Output

The program will print the inputs with labels. It will compute and print labels for the following. Some of the following can be recalled from the noted storage register after program execution.

	STORAGE REGISTER	LABELS
1. Total returns (\$/hd)	--	TRET
2. Total operating costs (\$/hd)	23	TOPC
3. Returns above operating costs (\$/hd)	--	RAOC
4. Selling price required to cover (breakeven) operating costs (\$/cwt.)	24	BEOC
5. Returns above all costs (\$/hd)	25	RAAC
6. Selling price required to cover (Breakeven) all costs (\$/cwt.)	26	BEAC
7. Breakeven purchase, beginning price at which all costs and the profit objective are covered (\$/cwt.)	27	BEPP
8. Costs of net gain (\$/cwt.)	28	CONG
9. Cost per head per day of items other than feed and feeder animal (\$/hd/day)	29	NFFC

Output: Press A

FEED?

6.5	BGWT
80.	BGPR
0.17	INTR
145.	DAYS
0.	LABR
0.035	D.L.
13.25	MKTG
13.3	VETM
0.	FIXD
10.5	FNWT
75.	FNPR
0.	πOBJ
2617.49	FD1Q
0.07	FD1P
0.	FD2Q
0.	FD2P
0.	FD3Q
0.	FD3P
0.	FD4Q
0.	FD4P
787.50	TRET
789.73	TOPC
-2.23	RAOC
75.21	BEOC
-2.23	RAAC
75.21	BEAC
79.69	BEPP
67.43	CONG
0.60	NFFC

All inputs are printed and ordered by storage register location. The STATS, or statistics section, provides the computed information.

The TOPC (total operating costs) is estimated to be \$789.73/hd. If the net selling price were \$75.21/cwt. (FNPR), returns above operating cost (RAOC) would be zero rather than -\$2.23/hd. Since fixed costs (FIXD) are zero ROAC=RAAC and BEOC=BEAC. The breakeven purchase price (BEPP) indicates that if we paid \$79.69/cwt. for the animals rather than \$80/cwt. RAAC would equal zero, other things equal. The costs of net gain (CONG) are estimated to be \$67.43/cwt. Costs in addition to those for the feed and feeder animal amount to \$0.60/hd/day (NFFC).

Example

Input		Keys Pressed
Beginning weight, pay weight of animal	(cwt.)	BGWT 6.5 STO 01
Beginning price, purchase price	(\$/cwt.)	BGPR 80 STO 02
Interest rate	(%/100)	INTR .17 STO 03
Days owned	(days)	DAYS 145 STO 04
Labor	(\$/hd)	LABR 0 STO 05
Death loss as percent of beginning value	(%/100)	D.L. .035 STO 06
Marketing costs, hauling, commission, etc.	(\$/hd)	MKTG 13.25 STO 07
Veterinary, medical, and miscellaneous costs	(\$/hd)	VETM 13.3 STO 08

Equations

TRET = FNWT x BGPR
 Feeder = BGWT x BGPR
 Feed = FD1Q x FD1P + FD2Q x FD2P + FD3Q x FD3P + FD4Q x FD4P
 Operating Capital = [(Feed + VETM) x .5 + Feeder] x INTR x DAYS ÷ 365
 Death = Feeder x D.L.
 TOPC = Feeder + Feed + Operating Capital + Death + VETM + LABOR + MKTG

RAOC = TRET - TOPC
 BEOC = TOPC ÷ FNWT
 RAAC = RAOC - FIXD
 BEAC = (TOPC + FIXD) ÷ FNWT
 BEPP = ((TRET · Feed - VETM - LABR - MKTG - FIXD
 - πOBJ) - (Feed + VETM) × .5 × INTR × DAYS
 ((1 + D.L. + (INTR × DAYS ÷ 365))) ÷
 BGWT
 CONG = (TOPC + FIXD - Feeder) ÷ (FNWT - BGWT)
 NFFC = (TOPC + FIXD - Feeder - Feed) ÷ DAYS

Reference

The input locations and equations of this program are similar to those of the TI 58/59 Agricultural Module program FM-15. FM-15 is described in: TI Programmable 58/59: Agriculture. Iowa State University and Texas Instruments Inc. 1978, 1979, pp. 103-125.

Summary

The worksheet illustrates one budget situation. Programmable calculators provide the

decision maker with the analytical power to quickly analyze numerous alternatives. Thus, worksheet space is provided suggesting alternative prices, weights, input costs, rates of gain, etc. This allows livestock producers to quickly evaluate such decisions at steers versus heifers, lighter cattle versus heavier cattle, fleshy cattle versus thin cattle, high concentrate rations versus low concentrate rations, shorter days on feeder versus longer days on feed, etc. It is necessary to have reasonable estimates of prices, cost, feed conversion, rates at gains, and other input data associated with each alternative. But, the calculator does all the "pencil pushing" once the appropriate numbers are entered.

There are no guarantees of profitable decisions. The best decisions can result in losses if prices and production costs results are less favorable than expected. But, the odds of a profitable decision may be greatly improved by evaluation of many logical alternatives. Programmable calculators can remove some of the drudgery of analysis of livestock costs and returns.

For general information on hand-held computers see OSU Fact Sheet 306 "Farm and Ranch Decisions Aided by Hand-Held Computers."

Worksheet

Enter program and labels. Program may be stored in BANK 1, on card 1, side 1, and BANK 2, on card 1, side 2. Labels may be stored in BANK 3, on card 2, side 1. (Data may be stored in BANK 4, on card 2, side 2.) Two cards are required.

Item	Units	Keys Pressed	Display	Your Values		
BEGINNING WEIGHT	cwt	6.5 STO 01	6.5			
BEGINNING PRICE	\$/cwt	80 STO 02	80.			
INTEREST RATE	%/100	.17 STO 03	0.17			
DAYS OWNED	DAYS	145 STO 04	145.			
LABOR	\$/hd	0 STO 05	0.			
DEATH LOSS	%/100	.035 STO 06	0.035			
MARKETING COSTS	\$/hd	13.25 STO 07	13.25			
VETERINARY AND MISC. COSTS	\$/hd	13.3 STO 08	13.3			
FIXED COSTS	\$/hd	0 STO 09	0.			
NET FINISHING WEIGHT	cwt	10.5 STO 10	10.5			
NET FINISHING PRICE	\$/cwt	75 STO 11	75.			
PROFIT OBJECTIVE	\$/hd	0 STO 12	0.			
FEED 1, QUANTITY	unit	2617.49 STO 13	2617.49			
FEED 1, PRICE	\$/unit	.07 STO 14	0.07			
FEED 2, QUANTITY	unit	0 STO 15	0.			
FEED 2, PRICE	\$/unit	0 STO 16	0.			
FEED 3, QUANTITY	unit	0 STO 17	0.			
FEED 3, PRICE	\$/unit	0 STO 18	0.			
FEED 4, QUANTITY	unit	0 STO 19	0.			
FEED 4, PRICE	\$/unit	0 STO 20	0.			
COMPUTE BUDGET		A	1.			

Program listing

Store in BANK 1, on card 1, side 1, and BANK 2, on card 1, side 2

000	76	LBL	056	73	RC+Ind	112	65	x	168	43	RCL
001	11	A	057	59	59	113	93	.5	169	10	10
002	98	ADV	058	69	DP	114	05	+ RCL	170	95	=
003	69	DP	059	06	06	115	85	+ RCL	171	42	STD
004	00	00	060	01	1	116	43	RCL	172	26	26
005	02	2	061	44	SUM	117	22	22	173	43	RCL
006	01	1	062	59	59	118	95	=	174	10	10
007	01	1	063	44	SUM	119	65	x	175	65	x
008	07	7	064	58	58	120	43	RCL	176	53	✓
009	01	1	065	97	DSZ	121	03	03	177	43	RCL
010	07	7	066	00	00	122	65	x	178	11	11
011	01	1	067	13	C	123	43	RCL	179	75	-
012	06	6	068	22	INV	124	04	04	180	43	RCL
013	07	7	069	58	FIX	125	55	+ 3	181	26	26
014	01	1	070	98	ADV	126	03	3	182	54	✓
015	69	DP	071	91	R/S	127	06	6	183	95	=
016	01	01	072	76	LBL	128	05	5	184	42	STD
017	69	DP	073	14	D	129	95	=	185	25	25
018	05	05	074	43	RCL	130	85	+ RCL	186	53	✓
019	02	2	075	01	01	131	43	RCL	187	43	RCL
020	00	0	076	65	x	132	22	22	188	10	10
021	42	STD	077	43	RCL	133	85	+ RCL	189	65	x
022	00	00	078	02	02	134	43	RCL	190	43	RCL
023	01	1	079	95	=	135	21	21	191	11	11
024	42	STD	080	42	STD	136	85	+ RCL	192	75	-
025	59	59	081	22	22	137	43	RCL	193	43	RCL
026	03	3	082	43	RCL	138	08	08	194	21	21
027	00	0	083	13	13	139	85	+ RCL	195	75	-
028	42	STD	084	65	x	140	43	RCL	196	43	RCL
029	58	58	085	43	RCL	141	22	22	197	08	08
030	76	LBL	086	14	14	142	65	x	198	75	-
031	12	B	087	85	+ RCL	143	43	RCL	199	43	RCL
032	73	RC*Ind	088	43	RCL	144	06	06	200	05	05
033	58	58	089	15	15	145	85	+ RCL	201	75	-
034	69	DP	090	65	x	146	43	RCL	202	43	RCL
035	04	04	091	43	RCL	147	05	05	203	07	07
036	73	RC+Ind	092	16	16	148	85	+ RCL	204	75	-
037	59	59	093	85	+ RCL	149	43	RCL	205	43	RCL
038	69	DP	094	43	RCL	150	07	07	206	09	09
039	06	06	095	17	17	151	95	=	207	75	-
040	01	1	096	65	x	152	43	STD	208	43	RCL
041	44	SUM	097	43	RCL	153	23	23	209	12	12
042	59	59	098	18	13	154	55	+ RCL	210	54	✓
043	44	SUM	099	85	+ RCL	155	43	RCL	211	75	-
044	58	58	100	43	RCL	156	10	10	212	53	✓
045	97	DSZ	101	19	19	157	95	=	213	43	RCL
046	00	00	102	65	x	158	42	STD	214	21	21
047	12	B	103	43	RCL	159	24	24	215	85	+ RCL
048	61	STD	104	20	20	160	53	✓	216	43	RCL
049	14	D	105	95	=	161	43	RCL	217	03	03
050	76	LBL	106	42	STD	162	23	23	218	54	✓
051	13	C	107	21	21	163	85	+ RCL	219	65	x
052	73	RC+Ind	108	85	+ RCL	164	43	RCL	220	93	✓
053	58	58	109	43	RCL	165	09	09	221	05	05
054	69	DP	110	08	08	166	54	✓	222	65	x
055	04	04	111	08	=	167	55	+ RCL	223	43	RCL

224 03 03 X
 225 65 X RCL
 226 43 RCL
 227 04 04
 228 55 +
 229 03 3
 230 06 6 6
 231 05 5
 232 55 = +
 233 55 + +
 234 56 + +
 235 01 1 +
 236 85 +
 237 43 RCL
 238 06 06
 239 85 +
 240 53 +
 241 43 RCL
 242 03 03
 243 65 X
 244 43 RCL
 245 04 04
 246 55 + +
 247 03 3
 248 06 6 6
 249 05 5
 250 54 +
 251 54 +
 252 95 = +
 253 55 +
 254 43 RCL
 255 01 01
 256 95 =
 257 42 STD
 258 27 27
 259 53 +
 260 43 RCL
 261 26 26
 262 65 X
 263 43 RCL
 264 10 10
 265 54 +
 266 75 -
 267 43 RCL
 268 22 22
 269 95 = +
 270 55 + +
 271 53 +
 272 43 RCL
 273 10 10
 274 75 -
 275 43 RCL
 276 01 01
 277 54 +
 278 95 =
 279 42 STD

380 28
 381 53 +
 382 43 RCL
 383 26 26
 384 65 X
 385 43 RCL
 386 10 10
 387 54 +
 388 75 -
 389 43 RCL
 390 21 21
 391 75 -
 392 43 RCL
 393 22 22
 394 95 = +
 395 55 +
 396 43 RCL
 397 04 04
 398 95 =
 399 42 STD
 400 29 29
 401 06 6
 402 42 STD
 403 00 00
 404 02 2
 405 04 4
 406 42 STD
 407 59 DP
 408 69 DP
 409 00 00
 410 03 3
 411 06 6 6
 412 03 3
 413 07 7
 414 01 1
 415 03 3
 416 03 3
 417 07 7
 418 03 3
 419 06 6
 420 69 DP
 421 02 02
 422 69 DP
 423 05 05
 424 03 3
 425 07 7
 426 03 3
 427 05 5
 428 01 1
 429 07 7
 430 03 3
 431 07 7
 432 69 DP
 433 04 04
 434 43 RCL
 435 10 10

336 65 X
 337 43 RCL
 338 11 11
 339 95 =
 340 58 FIX
 341 02 02
 342 69 DP
 343 06 06
 344 92 X+T
 345 01 1
 346 01 1
 347 06 6
 348 07 7
 349 03 3
 350 02 2
 351 03 3
 352 03 3
 353 01 1
 354 05 5
 355 69 DP
 356 04 04
 357 43 RCL
 358 23 23
 359 69 DP
 360 06 06
 361 94 +
 362 85 +
 363 32 X+T
 364 95 =
 365 92 X+T
 366 01 1
 367 01 1
 368 03 3
 369 05 5
 370 01 1
 371 03 3
 372 03 3
 373 02 2
 374 01 1
 375 05 5
 376 69 DP
 377 04 04
 378 92 X+T
 379 69 DP
 380 06 06
 381 61 STD
 382 13 0

Label Codes

Store in BANK 3, on
 card 2, side 1.

Code Storage Register

14224337. 30
 14223335. 31
 24313735. 32
 16134536. 33
 27131435. 34
 16402740. 35
 30263722. 36
 42173730. 37
 21244416. 38
 21314337. 39
 21313335. 40
 53321425. 41
 21160234. 42
 21160233. 43
 21160334. 44
 21160333. 45
 21160434. 46
 21160433. 47
 21160534. 48
 21160533. 49
 1114173215. 50
 1135131315. 51
 1114171315. 52
 1114173333. 53
 1115323122. 54
 1131212115. 55

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