Heifer Replacement Costs

Randy Saner
rsaner2@unl.edu
308-532-2683

Matt Stockton
mstockton2@unl.edu
308-696-6713

Shannon Sand
ssand2@unl.edu
308-696-6733

https://beef.unl.edu/

https://cap.unl.edu

EXTENSION

Replacement Heifer Breakeven Value

- These values are based on the authors making subjective adjustments to Kansas, FAPRI, and Nebraska beef producer information, representing Nebraska cow-calf production costs. Revenues are based on FAPRI cow and calf forecasts for the next 11 seasons. Cows are no older than 12 years of age.

EXTENSION

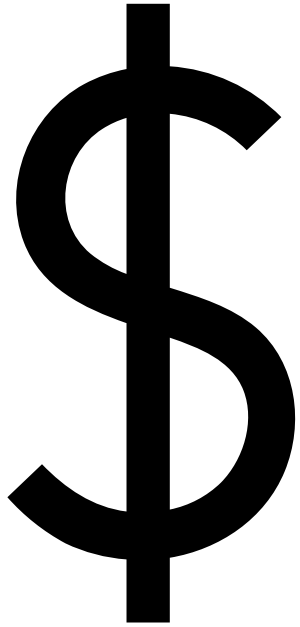
What information is used

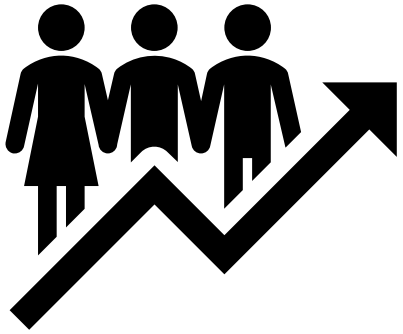
- Annual consistent replacement rates of 14, 20, 28%
- Three estimated levels of costs (UNL Cow-calf costs cow-q-lator)
  - High, Medium, Low
- Historical information on cow-calf productivity from GSL herd
- FAPRI, CattleFax, information to create localized prices and indices

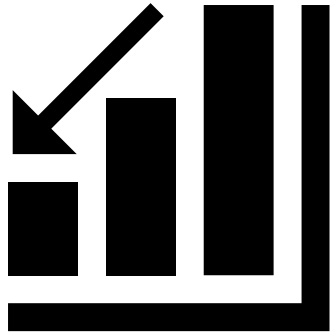
EXTENSION

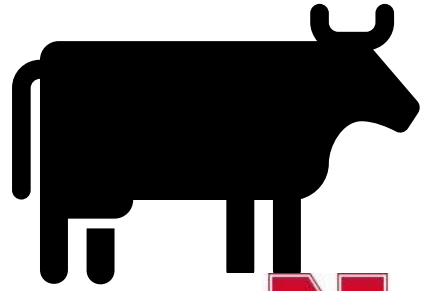
How we use the information

- Life like simulation
  - Biological
  - Marketing
  - Business
- Example









EXTENSION

Cow or Heifer Purchase Cow-Q-Lator

UNIVERSITY OF Nebraska Lincoln

Key OutputVariables (KOV's)

Avg Breakeven Price	$1,612.64
Avg Age to Positive Return	13
Avg Cow Age of the Herd	4.77
Mean Net Return (No NPV)	-$1,244.25
Mean Net Return (NPV)	-$1,189.98
Emperical Draw	98

4.85 Actual

Run Simulation

Age	Percent	Avg NPV	High NPV	Low NPV	Avg Breakeven	Cow Age
2 Year Old	28.5%	($1,523.09)	($1,184.33)	($1,868.64)	$1,244.59	2
3 Year Old	15.1%	($1,409.26)	($1,144.85)	($1,788.08)	$1,397.53	3
4 Year Old	13.0%	($1,321.23)	($949.29)	($1,666.29)	$1,502.27	4
5 Year Old	10.7%	($1,197.79)	($833.27)	($1,631.24)	$1,666.44	5
6 Year Old	8.2%	($1,021.47)	($598.91)	($1,412.51)	$1,821.78	6
7 Year Old	5.8%	($863.15)	($544.80)	($1,301.84)	$1,974.91	7
8 Year Old	5.0%	($719.60)	($395.26)	($1,142.82)	$2,095.16	8
9 Year Old	5.0%	($677.60)	($362.68)	($943.28)	$2,139.84	9
10 Year Old	3.4%	($477.42)	($104.73)	($994.84)	$2,261.97	10
11 Year Old	2.8%	($499.72)	($195.28)	($862.88)	$2,273.67	11
12 Year Old	2.5%	($370.82)	$196.49	($934.83)	$2,282.07	12

Cow Purchase CQL 2024 projections.xlsm

Search

Matt Stockton

File Home Insert Page Layout Formulas Data Review View Automate Developer Help Acrobat Simetar

Comments Share

Cut Copy Format Painter Paste

Times New Roman 12 Wrap Text Merge & Center Accounting

Normal Bad Good Neutral Calculation Check Cell Explanatory... Followed H... Hyperlink Input

Conditional Formatting Format as Table Insert Delete Format AutoSum Fill Clear Sort & Filter Find & Select Sensitivity Add-ins Analyze Data Create PDF and Share link Create PDF and Share via Outlook

Clipboard Font Alignment Number Styles Cells Editing Sensitivity Add-ins Adobe Acrobat

AutoSave Off Save Undo Redo New Open Spelling Print Preview and Print

H53 =X50+C37

	Age	Cow Costs	Cull Cow Value	Breakeven	Prob of Success: Net Revenue		$17.24	$34.48	$103.43
							$5.67	$11.34	$34.02
Stochatic Returns Based on a Specific Randomly Drawn Age	9	$1,672	$1,078	$2,208	w/o cow sale		$1,065.65	$1,290.79	$1,507.79
Simulated Results (Transferred to Simulation Sheet)	1672.42	954.52	9	2207.64	1	1202.21			

Oct-13 191.97

Key Input Variables (KIVs)

$/cwt above/below FAPRI (Cows)	0.0001	0.0001					Transport Cost/hd	$40		
$/cwt above/below FAPRI (Calves)	0.0001	0.0001		Stochastic			FAPRI Costs,1 Yes, 0 No	0		
	High	Low	Average	Realization	Greer Death Rate	1.03%	Cull Cow Sale costs/Hd	3%	Normal Distribution	
Purchase Price Heifer	$ 1,954.30	$ 1,914.30	$ 1,934.30	$(1,925.13)			Default Death Rate	2.0%	Standard Deviation	
Probability of Weaning a Calf	92%	87%		$ -	Borrowed Money		Interest Expense	5%	8	
Unborrowed Money Used Per Head	$ 1,954.30	100%					Borrowed Money Interest Rate	6%		
Use biological estimation for Cow/Calf weights	0 = NO, 1 = YES						Discount Rate	2%	Average Weaning Days	
Inflation Rate for Costs	0.22%				Wearing Age / days		High 260	Low 215	237.5 / 237	

Year	Annual Cost ($/head) High	Annual Cost ($/head) Low	Calf Weaning Weight (Lbs) High	Calf Weaning Weight (Lbs) Low	Calf Value ($/cwt) High	Calf Value ($/cwt) Low	Cull Cow Value ($/cwt) High	Cull Cow Value ($/cwt) Low	Cow Weight (Lbs) High	Cow Weight (Lbs) Low		
											991.50	Difference in
											0.274	Std Dev of Cow Wt
1	980.65	875.56	550	450	$ 175.61	$ 175.61	$ 76.07	76.0699	1271	712	0.710	85.41
2	1017.21	908.20	555	455	$ 190.38	$ 190.38	$ 82.84	82.8399	1245	738	0.360	100.051
3	980.80	875.69	560	460	$ 208.48	$ 208.48	$ 87.49	87.4899	1433	792	0.392	109.466
4	950.04	848.23	562	462	$ 217.24	$ 217.24	$ 90.91	90.9099	1490	771	0.576	116.168
5	950.04	840.35	564	464	$ 218.82	$ 218.82	$ 91.20	91.1999	1530	823	0.427	120.158
6	951.22	841.40	566	466	$ 212.08	$ 212.08	$ 87.50	87.4999	1550	845	0.698	121.436
7	961.59	850.57	565	465	$ 208.07	$ 208.07	$ 84.82	84.8199	1484	942	0.115	120.002
8	974.59	862.08	562	462	$ 204.83	$ 204.83	$ 82.63	82.6299	1476	901	0.445	115.856
9	986.58	872.68	560	460	$ 200.06	$ 200.06	$ 79.68	79.6799	1472	1001	0.999	108.997
10	999.73	884.31	555	450	$ 196.23	$ 196.23	$ 77.26	77.2599	1435	1046	0.354	99.426
11	1012.20	895.34	550	450	$ 192.46	$ 192.46	$ 74.89	74.8899	1341.25	1112	0.905	87.143
									102		0.276	
									10000.00			

95% Intercept	5 Strs	
Beta	-1.431	0.431
Starting Calf Value $/CWT	175.61	
Which Month # of the Year	12	
coefficent covert calf$ to Cow$	0.44	
Predicted Cull Cow Price	74.24	

Fixed Change in Wean Wt	0	lbs/calf @ weaning	8 Aug
Dep cost Adjustment	0	Dollars/hd (cow)	9 Sep
Random or Fixed change in Weaning Wt	1	1 = random, 2 = fixed	10 Oct
Cow Age Scenario	3	1 = Young Cows, 2 = Standard, 3 = Aged Cow	11 Nov
Type/Level of Production Cost	1	1 = low cost, 2 = medium cost, 3 = high cost	12 Dec
Use FAPRI Price or FAPRI stochastic Price	1	1 = FAPRI, 0 =Stoch FAPRI	
FAPRI or Inflation Cost Adjustment	1	1 = FAPRI, 0 = Inflation	
Stochastic Price Variations	1	1 = yes, 0 = no	
Use biological estimation for Cow/Calf weights	1	1 = yes, 0 = no	
Limit Age to Keep Cows	0	1= yes, 0 = no	

Standard Deviation of Cattle Prices			
Used in Y44	0.000025	Cows	
to Z54	0.000025	Calves	
Factor for	0.429725614		
16 yr old	85%	83%	
cull decision	1	1	

	Default	Greer et. al.
	400	400
	80	84
	66	68
	58	58
	52	48
	44	40
	38	34
	26	28
	18	22
	10	16
	6	2
	2	0

Herd Composition

Age	# of Cows 400	Cumulative Head	Percent of Herd		Weighted Age	Cumulative Age
2	56	56	0.140	0.14	0.28	112.00
3	48	104	0.120	0.260	0.36	144.00
4	46	150	0.115	0.375	0.46	184.00
5	44	194	0.110	0.485	0.55	220.00
6	42	236	0.105	0.590	0.63	252.00
7	40	276	0.100	0.690	0.70	280.00
8	38	314	0.095	0.785	0.76	304.00
9	34	348	0.085	0.870	0.77	306.00
10	28	376	0.070	0.940	0.70	280.00
11	18	394	0.045	0.985	0.50	198.00
12	6	400	0.015	1.000	0.18	72.00
	400	Total Cows	1.00		5.88	5.88 Avg Age
	0	Cow Adjustment				

Year	FAPRI Forecast Calf Price	FAPRI Cow Price	Stoch Calf Price	Stoch Cow Price	Inflation Fact
2022 Yr1	175.61	76.07	$ 175.61	$ 76.07	-0.036797
2023 Yr2	190.38	82.84	$ 190.38	$ 82.84	-0.031363
2024 Yr3	208.48	87.49	$ 208.48	$ 87.49	-0.009283
2025 Yr4	217.24	90.91	$ 217.24	$ 90.91	0.001248
2026 Yr5	218.82	91.2	$ 218.82	$ 91.20	0.010893
2027 Yr6	212.08	87.5	$ 212.08	$ 87.50	0.013628
2028 Yr7	208.07	84.82	$ 208.07	$ 84.82	0.012297
2029 Yr8	204.83	82.63	$ 204.83	$ 82.63	0.013325
2030 Yr9	200.06	79.68	$ 200.06	$ 79.68	0.012475
2031 Yr10	196.23	77.26	$ 196.23	$ 77.26	0.000000
2032 Yr11	192.46	74.89	$ 192.46	$ 74.89	0.000000

1240 994 Original Cow Val $ 1,925.13

Calculations

Year	Kansas Variable Costs/hd Non Repalcement	Death Loss Costs	Per Cow Total Costs	Calving Rate	Costs Per Calf	Death Rate	Average Calf Weight	Average Calf Value CWT	Calf $/Cow Weighted Calf Income	Cull Cow Value $/CWT	Average Cull Cow Weight	Potential Cull Cow Income (Cow Salvage Value)	Costs of Handling & Ship Cull Cow/Hd	Net Return W/O Culling	Money Borrowed Average Owed	Interest Expense	Owed Money	Current Cash Reserve	Cow Value	Net Loss or Gain on Cow Val	Net Asset Chg Cow + Cash Death and Dep	Current Net Worth NPV	New Cow Repacement Value	Difference of Cull $ Replacmt $	Difference of Cull $ Original $	Breakeven Replacment Value	Breakeven Original Value	
1	$959.51	$15.12	$974.63	89.0%	$ 1,095.18	2%	477	$201.52	$855.43	$76.07	994	$ 755.88	62.68	($119.20)	$ 119.20	$ 7.15	$ 126.36	$ (126.36)	$ 1,925.13	$ -	$ 1,672.42	$ 1,672.42	$ 1,925.13	$(1,169.26)	$(1,231.93)	$ (1,288.46)	$ (1,351.14)	$ 574.00
2	$995.29	$17.35	$1,019.79	88.9%	$ 1,147.06	2%	542	$215.64	$1,039.08	$82.84	1047	$ 867.54	66.03	$19.29	$ 126.36	$ 7.58	$114.65	$ (114.65)	$ 1,774.05	$ -	$ 1,544.75	$1,499.43	$ 1,917.26	$(1,049.72)	$(1,123.62)	$ (1,215.66)	$ (1,223.54)	$ 701.59
3	$959.66	$20.20	$987.44	91.2%	$ 1,083.30	2%	557	$232.66	$1,181.27	$87.49	1155	$ 1,010.09	70.30	$193.82	$ 114.65	$ 6.88	$ (72.30)	$ 72.30	$ 1,664.91	$ -	$ 1,809.50	$1,730.46	$ 2,232.30	$(1,222.21)	$ (985.34)	$ (1,128.30)	$ (891.43)	$ 1,033.70
4	$929.56	$22.08	$958.52	90.0%	$ 1,065.49	2%	563	$241.02	$1,220.70	$90.91	1214	$ 1,104.10	73.12	$262.18	$ (72.30)	$ (1.08)	$ (335.56)	$ 335.56	$ 1,584.79	$ -	$ 2,255.92	$2,125.49	$ 2,440.06	$(1,335.96)	$ (894.16)	$ (979.87)	$ (538.07)	$ 1,387.06
5	$920.93	$22.62	$942.47	89.7%	$ 1,050.99	2%	532	$237.49	$1,133.00	$91.20	1240	$ 1,522.26	85.67	$190.53	$ (335.56)	$ (5.03)	$ (531.12)	$ 531.12	$ 1,575.86	$ -	$ 2,638.11	$2,412.66	$ 2,499.57	$ (977.31)	$ (488.54)	$ (430.70)	$ 58.08	$ 1,983.21

28	0.02919708	-157.34226	0.03778677	-180.756852	0.03461063	-196.477585	0.03916084	-197.504454	0.0469
29	0.03023983	-157.34226	0.0391363	-179.756852	0.03584672	-195.477585	0.04055944	-195.504454	0.0486
30	0.03128259	-155.34226	0.04048583	-178.756852	0.03708282	-194.477585	0.04195804	-194.504454	0.0503
31	0.03232534	-154.34226	0.04183536	-177.756852	0.03831891	-194.477585	0.04335664	-192.504454	0.0520
32	0.03336809	-152.34226	0.04318489	-176.756852	0.03955501	-193.477585	0.04475524	-192.504454	0.0536
33	0.03441084	-151.34226	0.04453441	-176.756852	0.0407911	-193.477585	0.04615385	-192.504454	0.0553
34	0.0354536	-147.34226	0.04588394	-175.756852	0.04202719	-192.477585	0.04755245	-191.504454	0.0570
35	0.03649635	-147.34226	0.04733347	-175.756852	0.04326329	-191.477585	0.04895105	-188.504454	0.0587
36	0.0375391	-146.34226	0.048583	-174.756852	0.04449938	-189.477585	0.05034965	-188.504454	0.0604
37	0.03858186	-146.34226	0.04993252	-173.756852	0.04573548	-187.477585	0.05174825	-187.504454	0.0620
38	0.03962461	-145.34226	0.05128205	-171.756852	0.04697157	-186.477585	0.05314685	-185.504454	0.0637
39	0.04066736	-145.34226	0.05263158	-170.756852	0.04820766	-185.477585	0.05454545	-184.504454	0.0654
40	0.04171011	-144.34226	0.05398111	-169.756852	0.04944376	-183.477585	0.05594406	-183.504454	0.0671
41	0.04275287	-143.34226	0.05533063	-167.756852	0.05067985	-182.477585	0.05734266	-181.504454	0.0687
42	0.04379562	-142.34226	0.05668016	-167.756852	0.05191595	-181.477585	0.05874126	-181.504454	0.070
43	0.04483837	-140.34226	0.05802969	-165.756852	0.05315204	-179.477585	0.06013986	-180.504454	0.0721
44	0.04588113	-138.34226	0.05937922	-163.756852	0.05438813	-178.477585	0.06153846	-178.504454	0.073
45	0.04692388	-137.34226	0.06072874	-163.756852	0.05562423	-177.477585	0.06293706	-178.504454	0.0755
46	0.04796663	-136.34226	0.06207827	-162.756852	0.05686032	-177.477585	0.06433566	-177.504454	0.0771
47	0.04900938	-136.34226	0.0634278	-162.756852	0.05809642	-177.477585	0.06573427	-177.504454	0.0788
48	0.05005214	-135.34226	0.06477733	-161.756852	0.05933251	-175.477585	0.06713287	-173.504454	0.0805
49	0.05109489	-135.34226	0.06612686	-160.756852	0.0605686	-174.477585	0.06853147	-172.504454	0.0822
50	0.05213764	-134.34226	0.06747638	-159.756852	0.0618047	-172.477585	0.06993007	-172.504454	0.0838
51	0.0531804	-133.34226	0.06882591	-158.756852	0.06304079	-172.477585	0.07132867	-171.504454	0.0855
52	0.05422315	-132.34226	0.07017544	-158.756852	0.06427689	-171.477585	0.07272727	-168.504454	0.0872
53	0.0552659	-132.34226	0.07152497	-157.756852	0.06551298	-171.477585	0.07412587	-167.504454	0.0889
54	0.05630865	-132.34226	0.07287449	-157.756852	0.06674907	-170.477585	0.07552448	-166.504454	0.0906
55	0.05735141	-130.34226	0.07422402	-156.756852	0.06798517	-170.477585	0.07692308	-165.504454	0.0922
56	0.05839416	-129.34226	0.07557355	-156.756852	0.06922126	-169.477585	0.07832168	-163.504454	0.0939
57	0.05943691	-128.34226	0.07692308	-156.756852	0.07045735	-168.477585	0.07972028	-159.504454	0.0956
58	0.06047967	-127.34226	0.0782726	-155.756852	0.07169345	-168.477585	0.08111888	-159.504454	0.0973
59	0.06152242	-126.34226	0.07962213	-155.756852	0.07292954	-166.477585	0.08251748	-157.504454	0.0989
60	0.06256517	-125.34226	0.08097166	-154.756852	0.07416564	-166.477585	0.08391608	-156.504454	0.1006
61	0.06360792	-125.34226	0.08232119	-152.756852	0.07540173	-165.477585	0.08531469	-153.504454	0.1023
62	0.06465068	-125.34226	0.08367072	-152.756852	0.07663782	-162.477585	0.08671329	-153.504454	0.1040
63	0.06569343	-125.34226	0.08502024	-152.756852	0.07787392	-162.477585	0.08811189	-152.504454	0.105
64	0.06673618	-125.34226	0.08636977	-151.756852	0.07911001	-161.477585	0.08951049	-152.504454	0.1073
65	0.06777894	-124.34226	0.0877193	-150.756852	0.08034611	-160.477585	0.09090909	-151.504454	0.1090
66	0.06882169	-124.34226	0.08906883	-148.756852	0.0815822	-159.477585	0.09230769	-149.504454	0.1107
67	0.06986444	-123.34226	0.09041835	-147.756852	0.08281829	-157.477585	0.09370629	-148.504454	0.1124

Title Cow weights Sheet1 Analysis Simulation SimTotal FAPRI Sheet3 Breakeven Chart IndivdForcst +

Ready Accessibility: Investigate

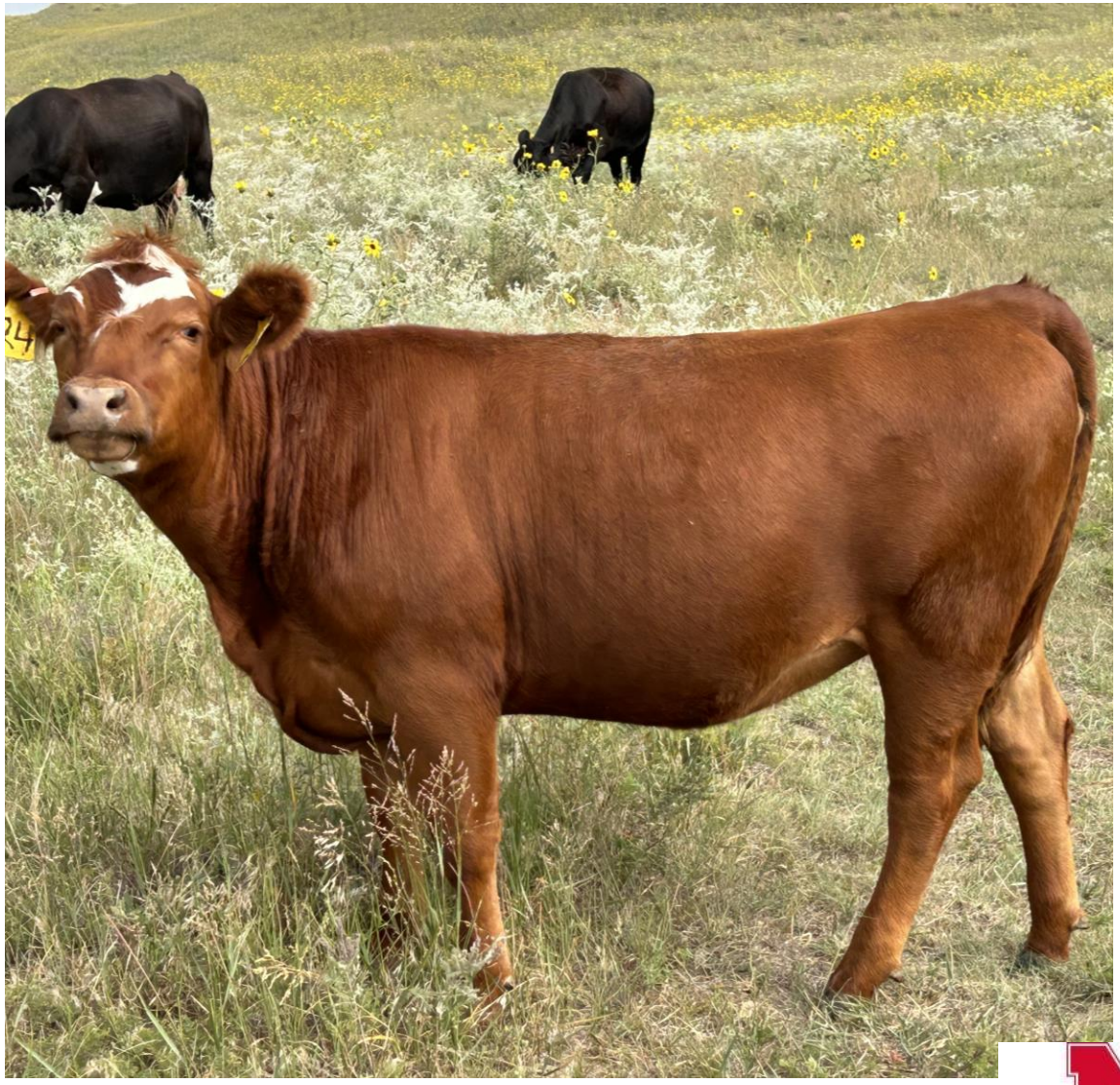
12 items 1 item selected 419 KB Always available on this device

100%

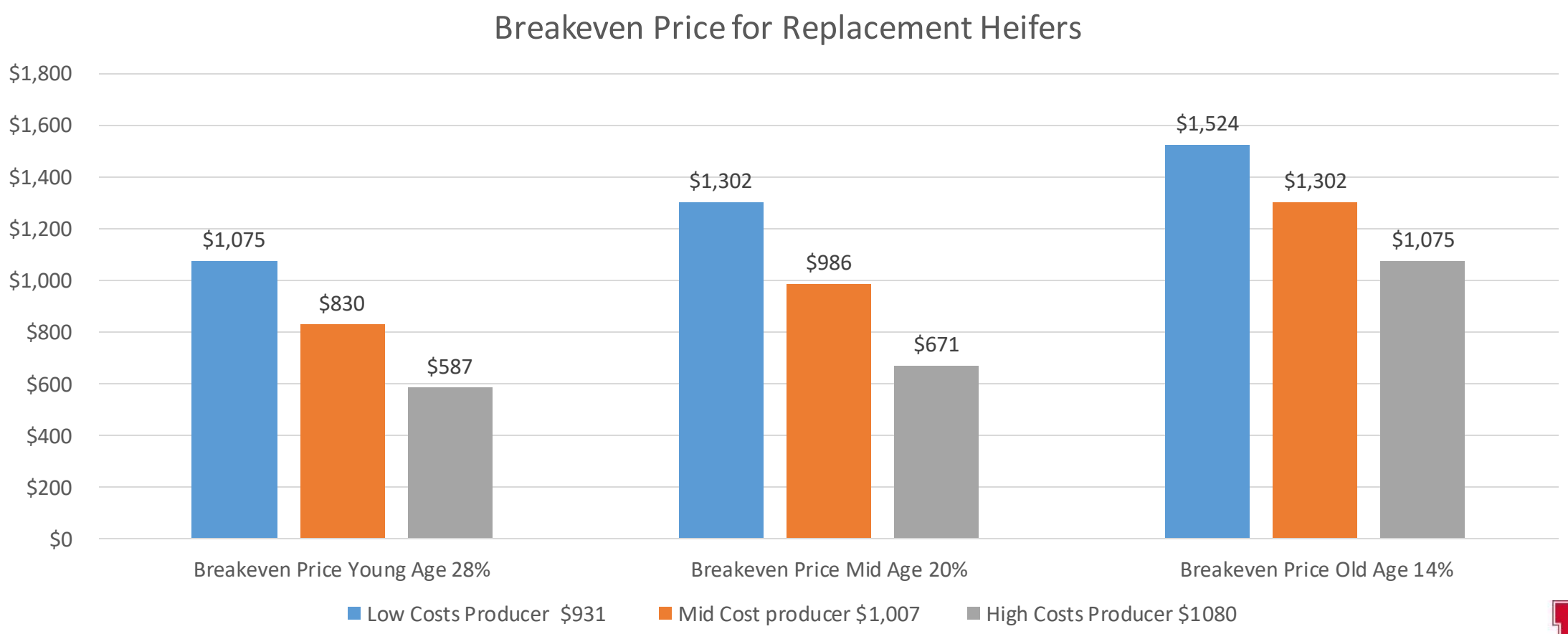
Type here to search Screenshots Inbox - matt.stockt... Cow Purchase CQL... Cow Breakeven Tab... 5 Ways to Take a Sc... 11:44 AM 11/30/2023

Critically Important Factors When Purchasing Heifers

- Heifers' ability to stay in the herd (Longevity)
- Current and future expected difference between costs and revenues (includes cattle cycle)

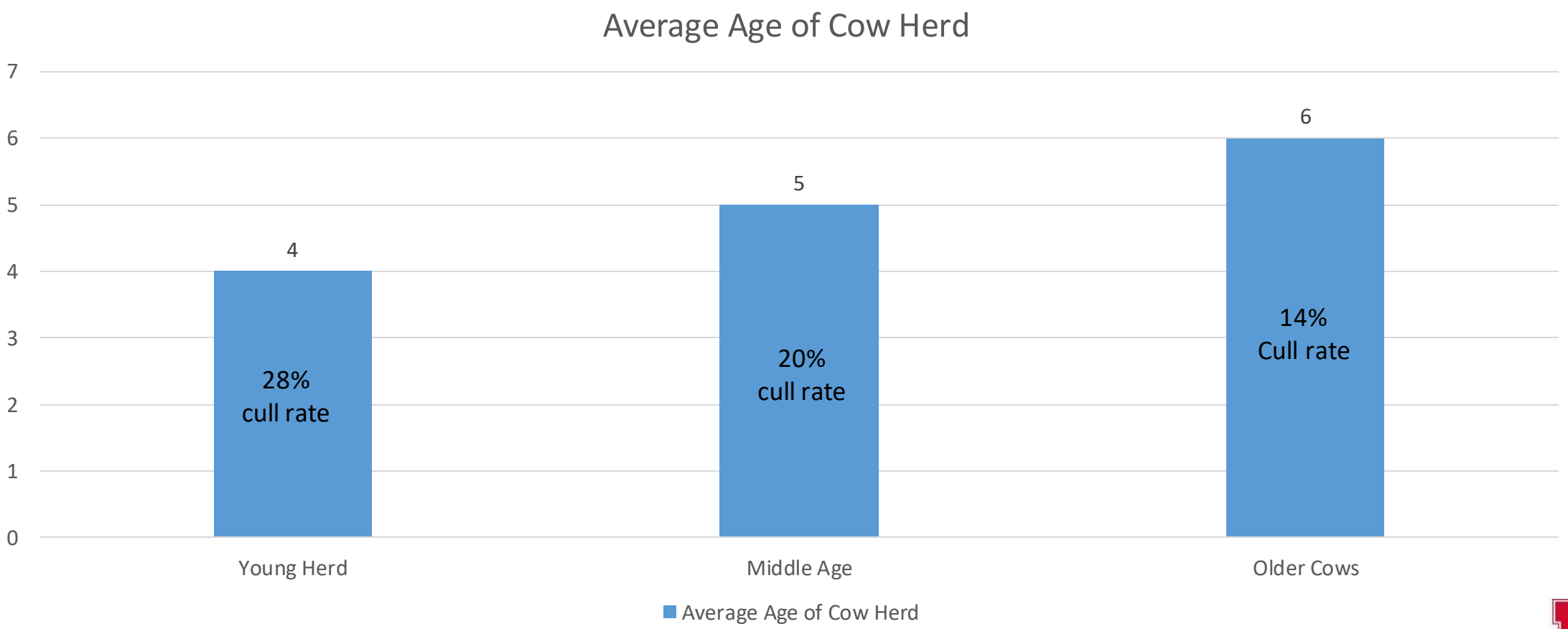


Heifer Replacement Cost & Breakeven Scenario



EXTENSION

Average of Cow Herd



EXTENSION

Breakeven Table by replacement rate and cost/hd								
Cost/hd		14%	15%	16%	17%	18%	19%	20%
Low	$930.96	$1,524.64	$1,487.56	$1,450.49	$1,413.42	$1,376.34	$1,339.27	$1,302.20
	$941.80	$1,466.55	$1,431.63	$1,396.71	$1,361.79	$1,326.87	$1,291.95	$1,257.03
	$952.65	$1,408.46	$1,375.70	$1,342.93	$1,310.17	$1,277.40	$1,244.64	$1,211.87
	$963.49	$1,350.37	$1,319.76	$1,289.15	$1,258.54	$1,227.93	$1,197.32	$1,166.71
	$974.33	$1,292.28	$1,263.83	$1,235.37	$1,206.92	$1,178.46	$1,150.01	$1,121.55
	$985.17	$1,234.19	$1,207.89	$1,181.59	$1,155.29	$1,128.99	$1,102.69	$1,076.39
	$996.02	$1,176.11	$1,151.96	$1,127.81	$1,103.67	$1,079.52	$1,055.38	$1,031.23
Med	$1,006.86	$1,118.02	$1,096.03	$1,074.03	$1,052.04	$1,030.05	$1,008.06	$986.07
	$1,017.33	$1,060.52	$1,040.61	$1,020.71	$1,000.80	$980.90	$960.99	$941.09
	$1,027.81	$1,003.01	$985.19	$967.38	$949.56	$931.74	$913.92	$896.10
	$1,038.28	$945.51	$929.78	$914.05	$898.31	$882.58	$866.85	$851.11
	$1,048.76	$888.01	$874.36	$860.72	$847.07	$833.42	$819.77	$806.13
	$1,059.23	$830.51	$818.95	$807.39	$795.83	$784.26	$772.70	$761.14
	$1,069.71	$773.01	$763.53	$754.06	$744.58	$735.11	$725.63	$716.15
High	$1,080.18	715.51	$708.12	$700.73	$693.34	$685.95	$678.56	$671.17

EXTENSION

Breakeven Table by replacement rate and cost/hd									
Cost/hd		21%	22%	23%	24%	25%	26%	27%	28%
Low	$930.96	$1,273.81	$1,245.43	$1,217.05	$1,188.67	$1,160.29	$1,131.91	$1,103.53	$1,075.15
	$941.80	$1,229.93	$1,202.82	$1,175.71	$1,148.61	$1,121.50	$1,094.39	$1,067.29	$1,040.18
	$952.65	$1,186.04	$1,160.21	$1,134.37	$1,108.54	$1,082.71	$1,056.87	$1,031.04	$1,005.21
	$963.49	$1,142.15	$1,117.59	$1,093.03	$1,068.48	$1,043.92	$1,019.36	$994.80	$970.24
	$974.33	$1,098.27	$1,074.98	$1,051.70	$1,028.41	$1,005.12	$981.84	$958.55	$935.27
	$985.17	$1,054.38	$1,032.37	$1,010.36	$988.34	$966.33	$944.32	$922.31	$900.29
	$996.02	$1,010.49	$989.75	$969.02	$948.28	$927.54	$906.80	$886.06	$865.32
Med	$1,006.86	$966.61	$947.14	$927.68	$908.21	$888.75	$869.28	$849.82	$830.35
	$1,017.33	$922.90	$904.71	$886.53	$868.34	$850.16	$831.97	$813.79	$795.60
	$1,027.81	$879.19	$862.29	$845.38	$828.47	$811.57	$794.66	$777.75	$760.85
	$1,038.28	$835.49	$819.86	$804.23	$788.60	$772.98	$757.35	$741.72	$726.10
	$1,048.76	$791.78	$777.43	$763.08	$748.73	$734.39	$720.04	$705.69	$691.34
	$1,059.23	$748.07	$735.00	$721.93	$708.87	$695.80	$682.73	$669.66	$656.59
	$1,069.71	$704.37	$692.58	$680.79	$669.00	$657.21	$645.42	$633.63	$621.84
High	$1,080.18	$660.66	$650.15	$639.64	$629.13	$618.62	$608.11	$597.60	$587.09

EXTENSION

Probability of paying off the $1940.50 expected $/hd. costs

$/hd	Cost type	14% culling rate	20% culling rate	28% culling rate
$931	Low	35.3%	22.1%	12%
$1007	Medium	3.2%	1.9%	1%
$1,081	High	.016%	.024%	.008%


Questions?