

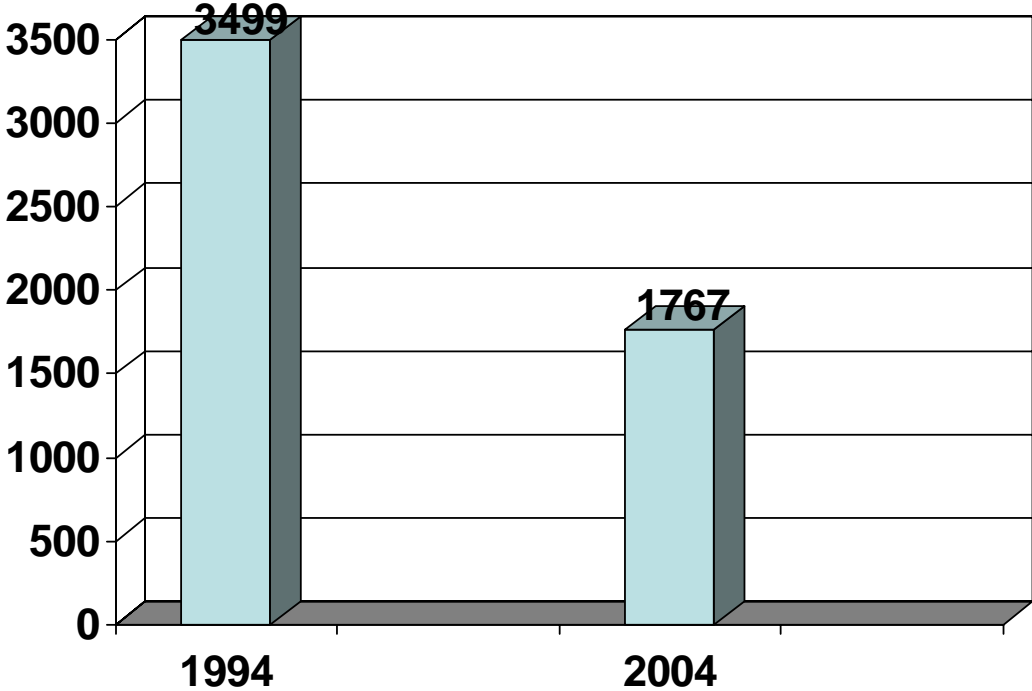
Economic Opportunities of Pasture-Based Dairying in Missouri



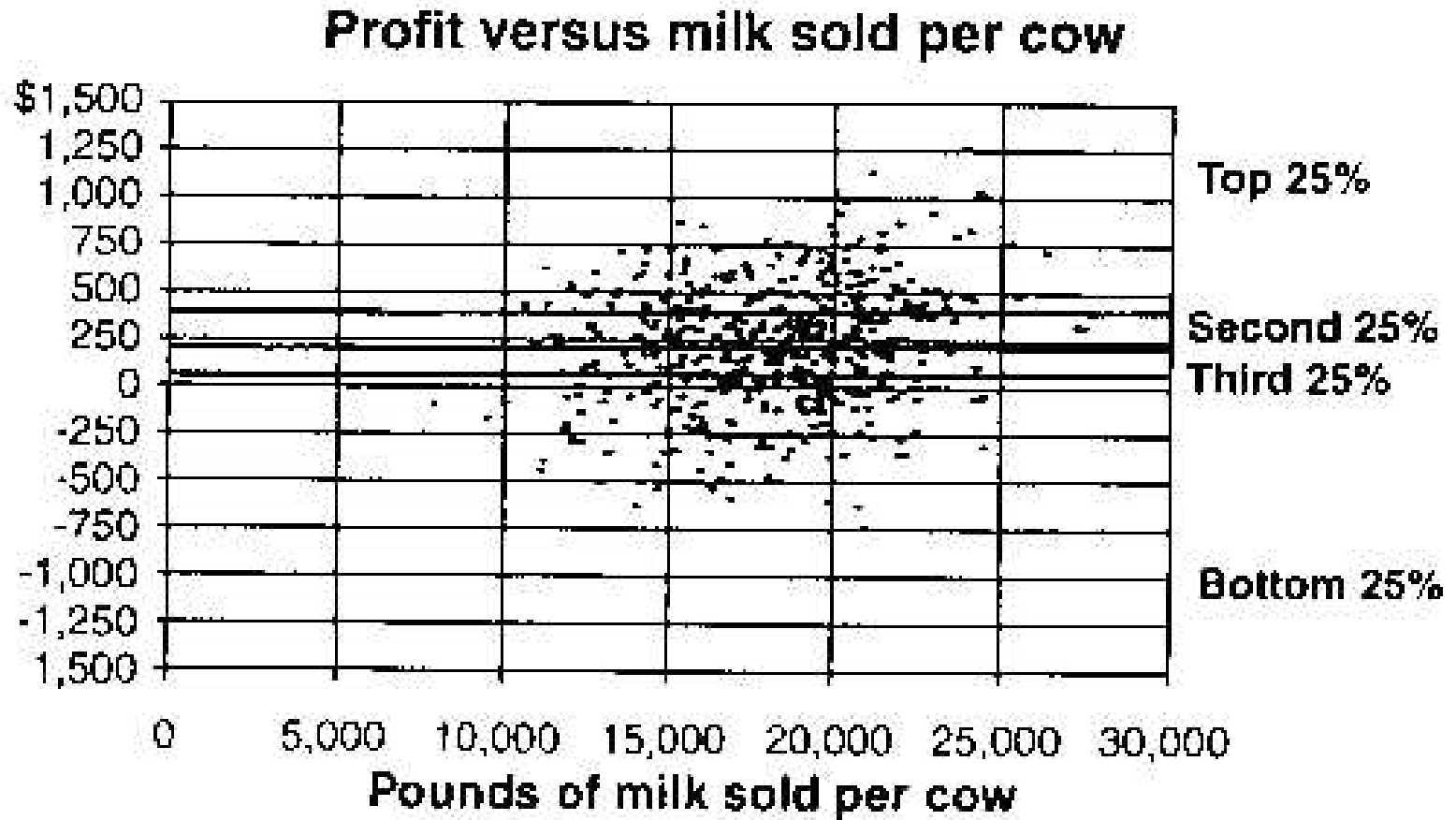
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University of Missouri Extension
University of Missouri Southwest Center

The Situation

Permits Issued
to Grade A and
Manufacturing
Dairies in
Missouri



Maximum Milk or Profit?



• Hlubik and Smith	Penn	1988	\$85
• Pillsbury and Burns	Vermont	1989	\$152
• Emmick	Penn	1991	\$153
• Tranel and Frank	Wisconsin	1991	\$133
• Sheppard	Penn	1991	\$168
• Emmick and Toomer	NY	1991	\$147
• Klemme	Wisconsin	1992	\$215
• Parker et al	Penn	1992	\$121
• Parker et al	Penn	1993	\$78
• Rotz and Rodgers	Penn	1994	\$161-182
• Smith	NY	1994	\$135
• Ford and Hanson	Penn	1994	\$137-158
• Ford	Penn	1995	\$250
• Rust et al	Minnesota	1995	\$49
• Bower-Spence	Penn	1995	\$160
• Elbehri and Ford	Penn	1995	\$140-206
• Smith and Knoblauch	NY	1996	\$63
• Jackson-Smith et al	Wisconsin	1996	\$265
• Frank et al	Minnesota	1996	\$57-92
• Winsten and Petrucci	Vermont	1996	\$92-294
• Nichols and Knoblauch	NY	1996	\$47
• Ford	Penn	1996	\$48-248

\$142

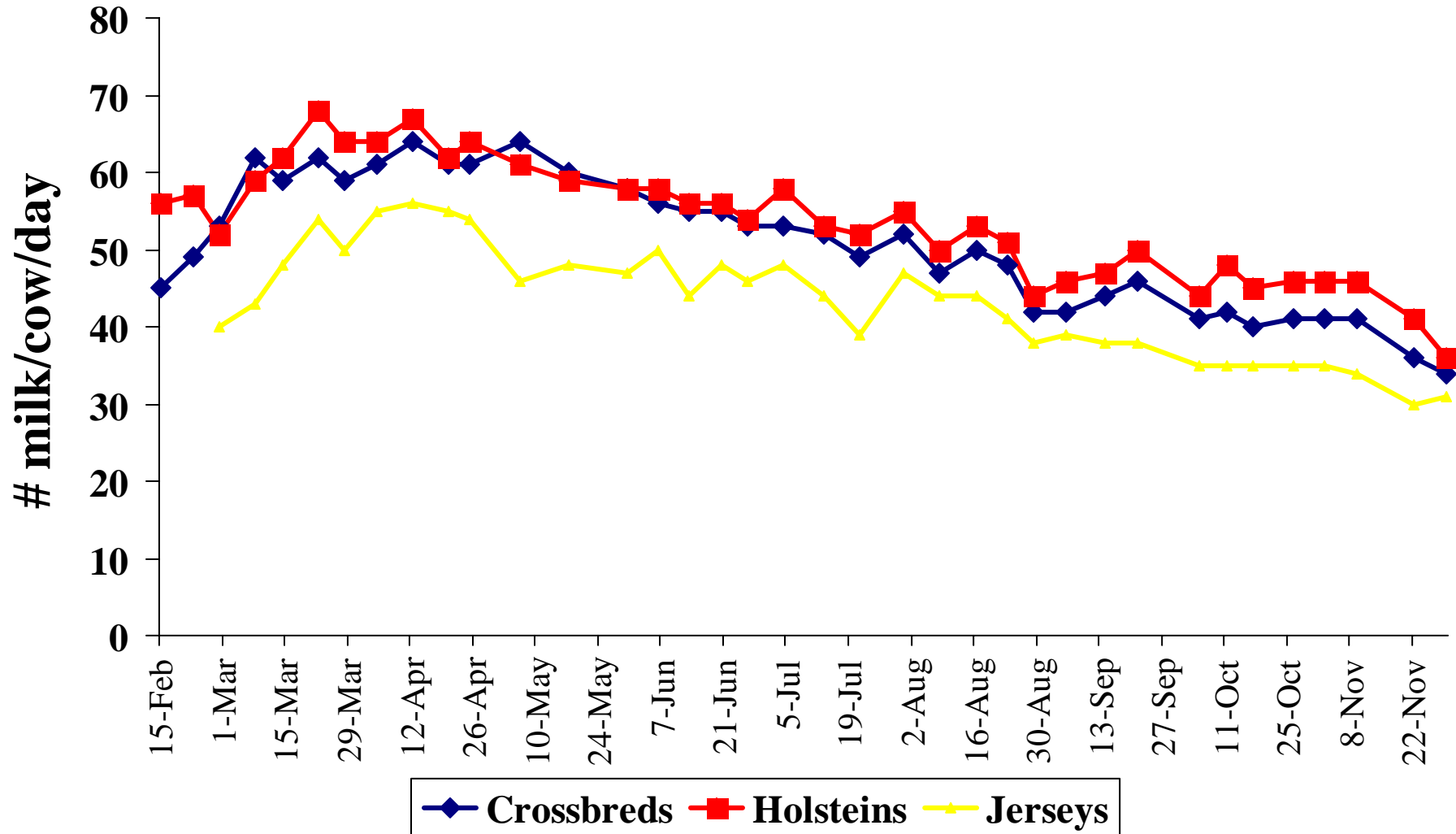
Common Perceptions Regarding Grazing

- We did that 20 years ago!

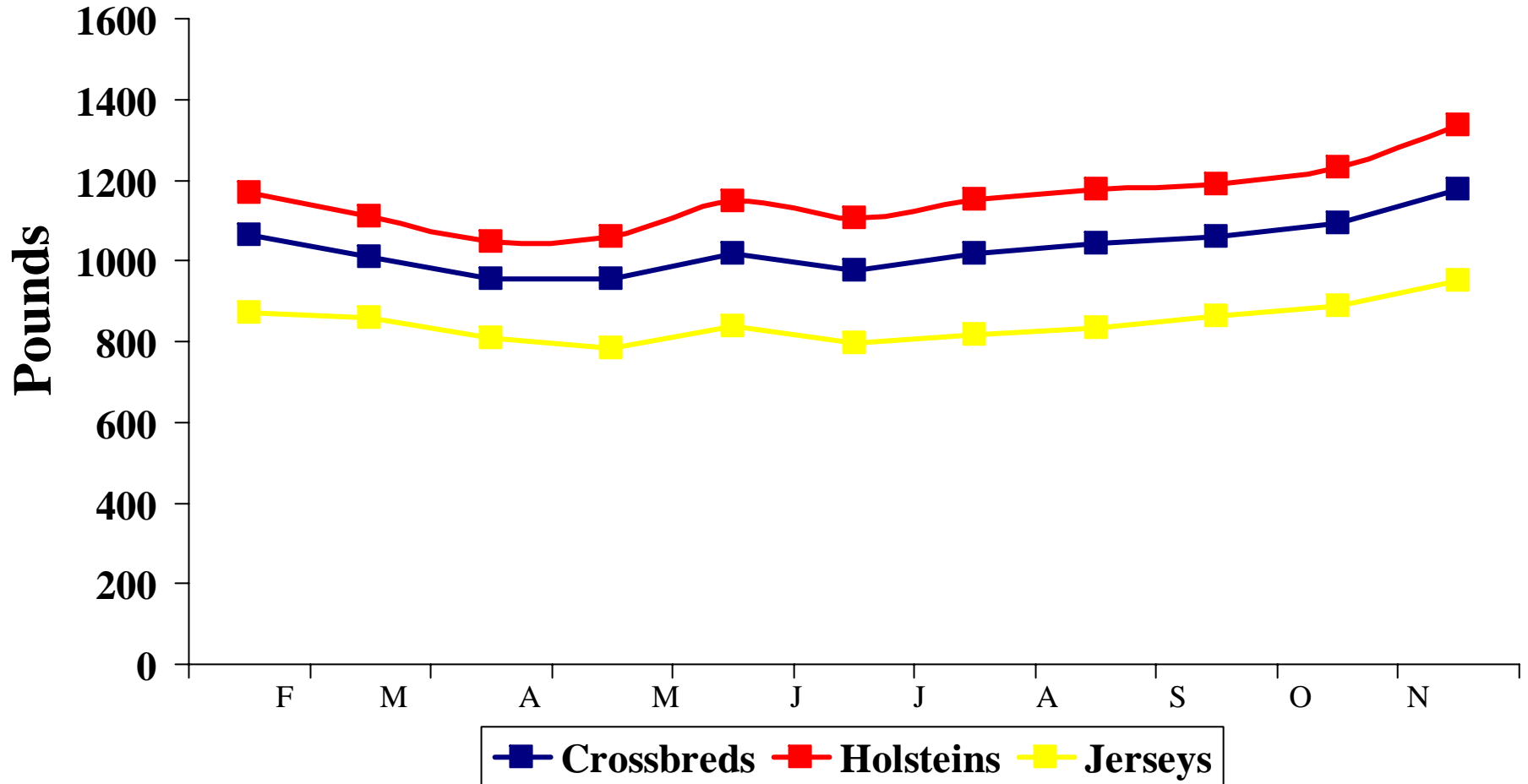
Common Perceptions Regarding Grazing

- We did that 20 years ago!
- Cows will
 - Lose weight
 - Not breed back
 - Not milk

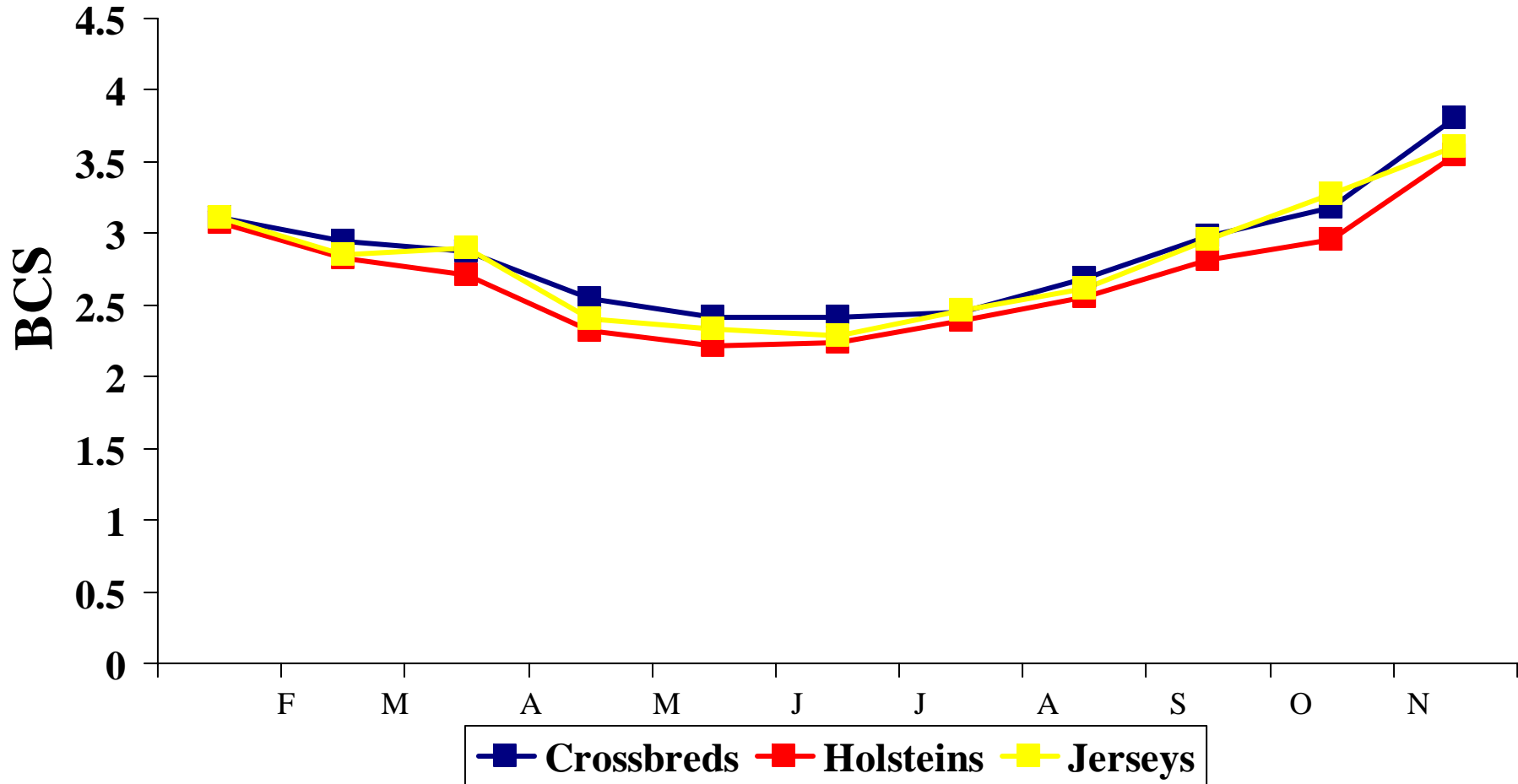
Lactation Curve for Breeds



Body Weights Throughout Lactation



Body Condition Score



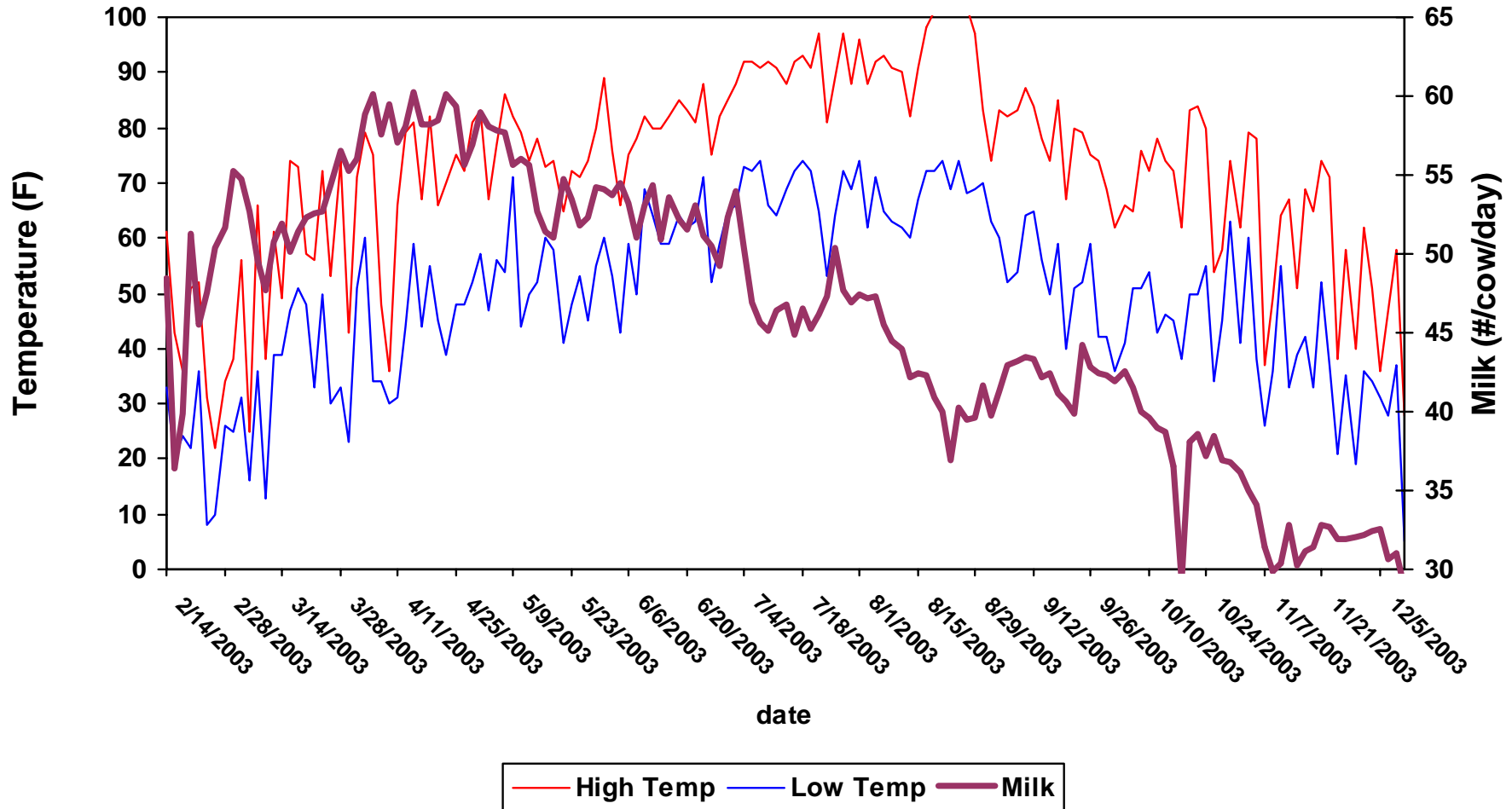
Common Perceptions Regarding Grazing

- We did that 20 years ago!
- Cows will
 - Lose weight
 - Not breed back
 - Not milk
- What about drought and heat stress?

Plan on 3 lb hay/d during the grazing season



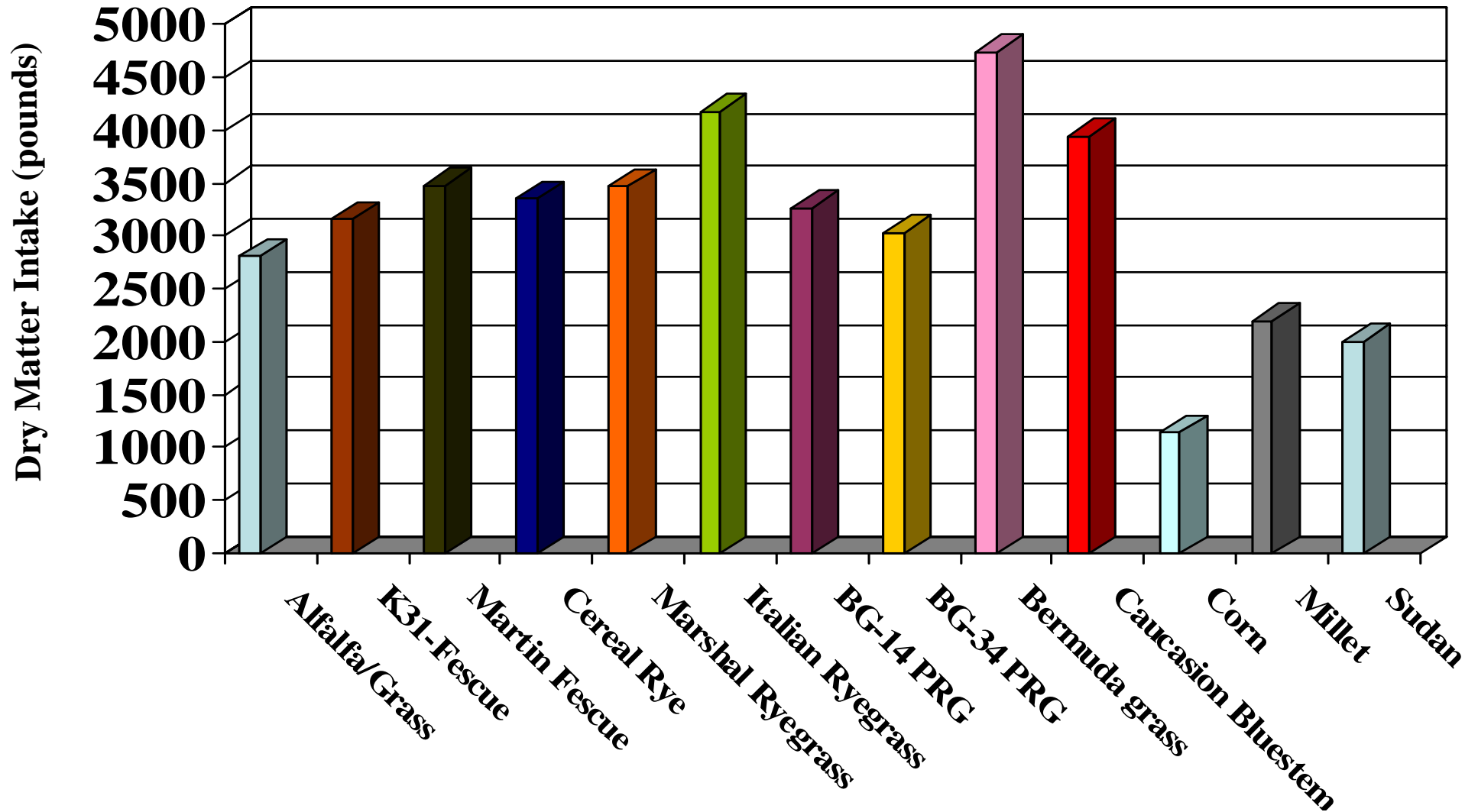
Milk/Temperature Relationship 2003



Common Perceptions Regarding Grazing

- We did that 20 years ago!
- Cows will
 - Lose weight
 - Not breed back
 - Not milk
- What about drought?
- It's a mystical voodoo art..where's the science

Dry Matter Intake for Forages in 2003



Mooney Dairy Farm Data

	1993	1994
# Milk/day/cow	58.6	59.0
\$/cow/day received	\$7.51	\$7.30
# grain/cow/day	18.0	18.8
Grain cost/cow/day	\$1.35	\$1.64
Forage cost/cow/day	\$0.64	\$0.72
I/FC/cow/day	\$5.52	\$4.94
Feed Cost/CWT milk	\$3.40	\$4.00

Data from Ron Young, University of Missouri

Summary of Mooney Data

- Grazing \$0.88/day advantage
- Grazing period...April 1- November 24
- 269 days x \$0.88 = \$237/cow
- 55 cows x \$237 = \$13,035 year

- Grazing \$0.84/day advantage
- Grazing period...April 1 - December 4
- 279 days x \$0.84 = \$234/cow
- 55 cows x \$234 = \$12,870 year

The Data...the disclaimer!

- May not make economist happy
- Was designed by Farmers for Farmers
- Is being utilized by producers and lenders alike in remodels and start-ups
- We do not calculate
 - Unpaid family labor
 - Depreciation
 - Fed/State taxes
 - P&I

Overview and Structure of Missouri Grazing Dairies

	1998	1999	2000	2001	2002	2003	2004	2005
Cow numbers	83	96	92	96	113	153	156	157
Total farm area (acres)	325	303	318	287	315	266	266	301
Dairy grazing area (acres)	122	90.8	99.3	150	154	180	187	200
Grain fed during year (lb/cow/day)	16.3	17.2	17.6	16	17	15	15	13
Hay fed during year (lb/cow/day)	9.4	12	11.2	12	10	9	10	12
Other forage fed during year (lb/cow/day)	1.2	1.2	2.4	0	0	2	1	0
Numbers of days grazed	245	239	235	221	216	237	232	230
Weight of cows (lb)	1190	1205	1219	1108	1118	1107	1100	1114
Age of cows (months)	52	57.7	55.2	57	58	60	59	53
Cull rate (percent)	20	20	18	20	19	17	17	17
Milk shipped per cow (lb)	14,022	13,660	13,682	12,187	12,064	12,671	12,510	13,380
Milkfat (percent)	3.66	3.63	3.74	3.94	4.00	3.93	3.89	3.9
Protein (percent)	3.21	3.27	3.22	3.3	3.3	3.23	3.23	3.25
Somatic cell count	334,480	335,250	369,986	374,083	402,400	340,714	300,714	298,464

Income for Missouri pasture-based dairy producers

Income on per Cow Basis

	1998	1999	2000	2001	2002	2003	2004	2005
	\$/cow	\$/cow	\$/cow	\$/cow	\$/cow	\$/cow	\$/cow	\$/cow
Income:								
Milk sales	2098	1942	1743	1913	1540	1745	2113	2102
Cattle sales	140	167	192	177	200	120	187	182
Misc./Dividends	28	44	84	99	142	162	45	26
Total Income	2266	2153	2019	2189	1882	2027	2345	2310

Income on CWT Basis

	1998	1999	2000	2001	2002	2003	2004	2005
	\$/cwt	\$/cwt	\$/cwt	\$/cwt	\$/cwt	\$/cwt	\$/cwt	\$/cwt
Income:								
Milk sales	14.96	14.22	12.74	15.70	12.88	13.77	16.89	15.71
Cattle sales	1.00	1.22	1.40	1.45	1.66	0.95	1.48	1.36
Misc./Dividends	0.20	0.33	0.61	0.81	1.19	1.28	0.36	0.19
Total Income	16.16	15.77	14.75	17.96	15.73	16.00	18.73	17.26

Cost per cow for pasture-based dairy systems

	1998	1999	2000	2001	2002	2003	2004	2005
Expenditures:								
Concentrates	561	535	520	453	448	502	484	522
Harvested forages	156	146	190	245	196	212	207	235
Hired labor	63	60	57	80	66	92	109	195
Rent	4	4	21	3	10	0	0	5
DHIA	9	7	7	4	4	4	6	9
Semen/Breeding	5	8	11	14	13	9	13	17
R.E/P.P. taxes	8	7	7	8	7	6	6	6
Milk marketing	113	106	110	96	84	84	85	91
Repairs/Truck/Fuel	81	77	58	93	97	56	69	75
Vet/Medicine	35	39	31	39	33	58	54	50
Parlor supplies	54	44	54	51	40	40	46	47
Utilities	51	47	54	62	51	49	48	48
Insurance	20	19	26	24	21	20	21	20
Farm Supplies	14	9	26	28	15	32	41	53
Total Cow Expenditures	1174	1108	1172	1200	1085	1164	1189	1373
Forage Expenses:								
Rent	5	8	11	16	13	10	10	12
Fertilizer	50	44	51	62	56	55	54	60
Seed/Spray	25	17	40	45	18	22	23	28
Custom	8	21	17	12	21	11	59	66
Fuel	3	10	12	22	11	9	10	29
R.E./P.P. taxes	6	6	6	8	7	4	4	6
Fence/Water	9	13	24	19	20	28	18	13
Total Forage Expenditures	106	119	162	184	146	139	178	214
Total Operating Expenditures	1280	1227	1334	1384	1231	1303	1367	1587
Operating Margin	986	927	685	805	651	724	978	723

Cost per CWT milk for pasture-based dairy systems

	1998	1999	2000	2001	2002	2003	2004	2005
Expenditures:								
Concentrates	4	3.92	3.8	3.72	3.71	3.97	3.87	3.9
Harvested forages	1.11	1.07	1.39	2.01	1.63	1.67	1.65	1.76
Hired labor	0.45	0.44	0.41	0.65	0.54	0.72	0.88	1.46
Rent	0.03	0.03	0.15	0.03	0.08	0	0	0.04
DHIA	0.07	0.05	0.05	0.04	0.03	0.03	0.05	0.07
Semen/Breeding	0.03	0.06	0.08	0.11	0.11	0.07	0.1	0.13
R.E/P.P. taxes	0.06	0.05	0.06	0.07	0.07	0.05	0.05	0.04
Milk marketing	0.8	0.78	0.81	0.79	0.71	0.67	0.68	0.68
Repairs/Truck/Fuel	0.58	0.56	0.43	0.77	0.81	0.45	0.55	0.56
Vet/Medicine	0.25	0.28	0.23	0.32	0.27	0.46	0.43	0.38
Parlor supplies	0.39	0.32	0.4	0.42	0.33	0.32	0.36	0.35
Utilities	0.36	0.34	0.4	0.51	0.42	0.39	0.39	0.36
Insurance	0.14	0.14	0.19	0.2	0.18	0.16	0.16	0.16
Farm Supplies	0.1	0.07	0.19	0.23	0.12	0.25	0.33	0.4
Total Cow Expenditures	8.37	8.11	8.59	9.87	9.01	9.21	9.50	10.29
Forage Expenses:								
Rent	0.04	0.06	0.08	0.13	0.10	0.08	0.08	0.09
Fertilizer	0.36	0.32	0.37	0.51	0.47	0.44	0.43	0.44
Seed/Spray	0.17	0.12	0.29	0.37	0.15	0.17	0.18	0.21
Custom	0.06	0.15	0.12	0.1	0.17	0.09	0.48	0.49
Fuel	0.02	0.07	0.09	0.18	0.09	0.07	0.08	0.21
R.E./P.P. taxes	0.05	0.05	0.04	0.06	0.07	0.04	0.04	0.04
Fence/Water	0.06	0.09	0.18	0.16	0.16	0.22	0.15	0.09
Total Forage Expenditures	0.76	0.86	1.17	1.51	1.21	1.11	1.44	1.57
Total Operating Expenditures	9.13	8.97	9.76	11.38	10.22	10.32	10.94	11.86
Operating Margin	7.03	6.8	4.99	6.58	5.51	5.68	7.79	5.40

Is Labor an Issue...Yet?

- 1999
 - 48.7 cows/employee
- 2005
 - 53.2 cows/employee
- \$180/cow difference or
 - \$28,260 on 156 cow operation!
 - Reasons for high labor costs
 - Expansion?
 - Cultural...the way Dad did it?
 - Family?
 - Not recognized as an issue?
 - Fear of success?

Comparison of Missouri MIG dairies to large conventional operations

	2002		2003		2004		2005	
	Grazing	Conv.	Grazing	Conv.	Grazing	Conv.	Grazing	Conv.
# Milk shipped/cow	12,064	25,505	12,671	24,270	12,510	24,472	13,380	25,668
Cost/CWT Milk	\$10.22	\$11.01	\$10.32	\$11.30	\$10.94	\$12.12	\$11.86	\$12.01
Operating Margin	\$651	\$265	\$724	\$92	\$978	\$831	\$723	\$786
# Cows	113	1578	153	2496	156	2031	157	2343
% Cull Rate	19	32	17	41	17	30	17	27

Conv. Data derived from
G&M data; Washington State

Structure and basic production data of University of Missouri SW Research Center Seasonal MIG Dairy

		1999	2000	2001	2002	2003	2004	2005
Cow #		49.1	59.1	60.4	63.7	70.4	71.7	74.1
Farm Ac		84	84	84	87	97	97	97
Ac Grazed		79	79	79	82	92	92	92
Grain/d		12.4	14.2	12.1	15.6	14.5	14.4	12.1
Hay/d		11.4	11.5	11.2	13.6	13.7	11.5	13.7
Other Forages/d		0	0	0	0	0	0	0
Days Grazed		188	244	230	198	235	263	245
Weight		1022	1030	1061	1097	1011	1042	1035
Age Mo.		25	32	38	44	43	47	50
Total Cull %		32	19	22	26	26	36.4	18.3
Outside Window %		12	16	16	17	10	18.2	8.5
Other Cull %		20	3	6	9	16	11.7	9.8
Vol Dairy Culls %							6.5	
Milk/cow		10,146	12,714	12,952	13,711	12,731	13,807	12,940
BF %		3.95	3.96	3.74	4.12	4.2	4.19	4.14
Protein %		3.4	3.24	3.22	3.28	3.35	3.32	3.25
SCC		223,000	51,800	129,182	112,727	106,454	185,909	117,437

Expenditure for University of Missouri SW Research Center seasonal MIG dairy

	1999	2000	2001	2002	2003	2004	2005	
	\$/cow	\$/cow	\$/cow	\$/cow	\$/cow	\$/cow	\$/cow	CWT
Expenditures								
Concentrate	299	330	305	388	392	428	352	2.72
Forages	106	174	254	240	253	139	173	1.33
Labor*	54	54	51	54	69	49	98**	0.75**
DHIA	0	14	12	13	12	16	18	0.14
Semen/Breeding	23	21	14	29	19	66	43	0.33
R.E./P.P Taxes*	7	6	7	7	7	9	6	0.05
Milk Marketing	90	114	117	102	81	103	100	0.77
Repairs/Truck/Fuel*	107	66	74	69	63	91	75	0.58
Vet/Med	41	53	37	31	48	59	38	0.3
Parlor Supplies	52	55	38	43	51	39	70	0.54
Utilities	46	38	41	49	40	48	43	0.33
Insurance*	17	17	24	29	21	26	20	0.15
Miscellaneous	33	15	42	42	38	11	13	0.1
Total Cow								
Expenditures/cow	875	957	1016	1096	1094	1084	951	
/cwt	8.61	7.53	7.84	7.99	8.59	7.85		8.1
Forage Expenses								
Fertilizer	7	29	70	48	58	45	45	0.35
Seed/Spray	27	32	39	47	40	25	26	0.2
Custom Hire*	0	19	15	12	23	14	33	0.26
Fuel*	3	9	11	23	11	21	29	0.22
R.E./P.P. Taxes*	5	5	6	9	7	8	6	0.05
Fence/Water	5	4	9	13	18	10	14	0.1
Total Forage								
Expenditures/cow	47	98	150	152	157	123	153	
CWT	0.46	0.78	1.16	1.11	1.23	0.89		1.18
milk/cow	10,146	12,714	12,952	13,711	12,731	13,807	12,940	

Income for University of Missouri SW Research Center seasonal MIG dairy

		1999	2000	2001	2002	2003	2004	2005	
								\$cow	CWT
Income									
Milk Sales		13.29	13.67	16.53	12.85	13.10	17.94	\$2,070	15.99
Cattle Sales		1.76	1.61	1.84	1.56	1.34	2.66	\$224	1.74
Govt./Dividends					1.27	2.31	0.04	\$3	0.02
Total Income/cwt		15.05	15.28	18.37	15.68	16.75	20.64	\$2,297	
	/cow	1527	1943	2380	2150	2132	2849		17.75
Total Expenditures									
	\$/cwt	9.07	8.31	9	9.1	9.82	8.74		9.28
	\$/cow	921	1055	1166	1248	1251	1207	1202	
Operating Margin									
	\$/cwt	5.98	6.97	9.37	6.58	6.93	11.9		8.47
	\$/cow	606	888	1214	902	881	1642	1095	

Heifer expenses not included

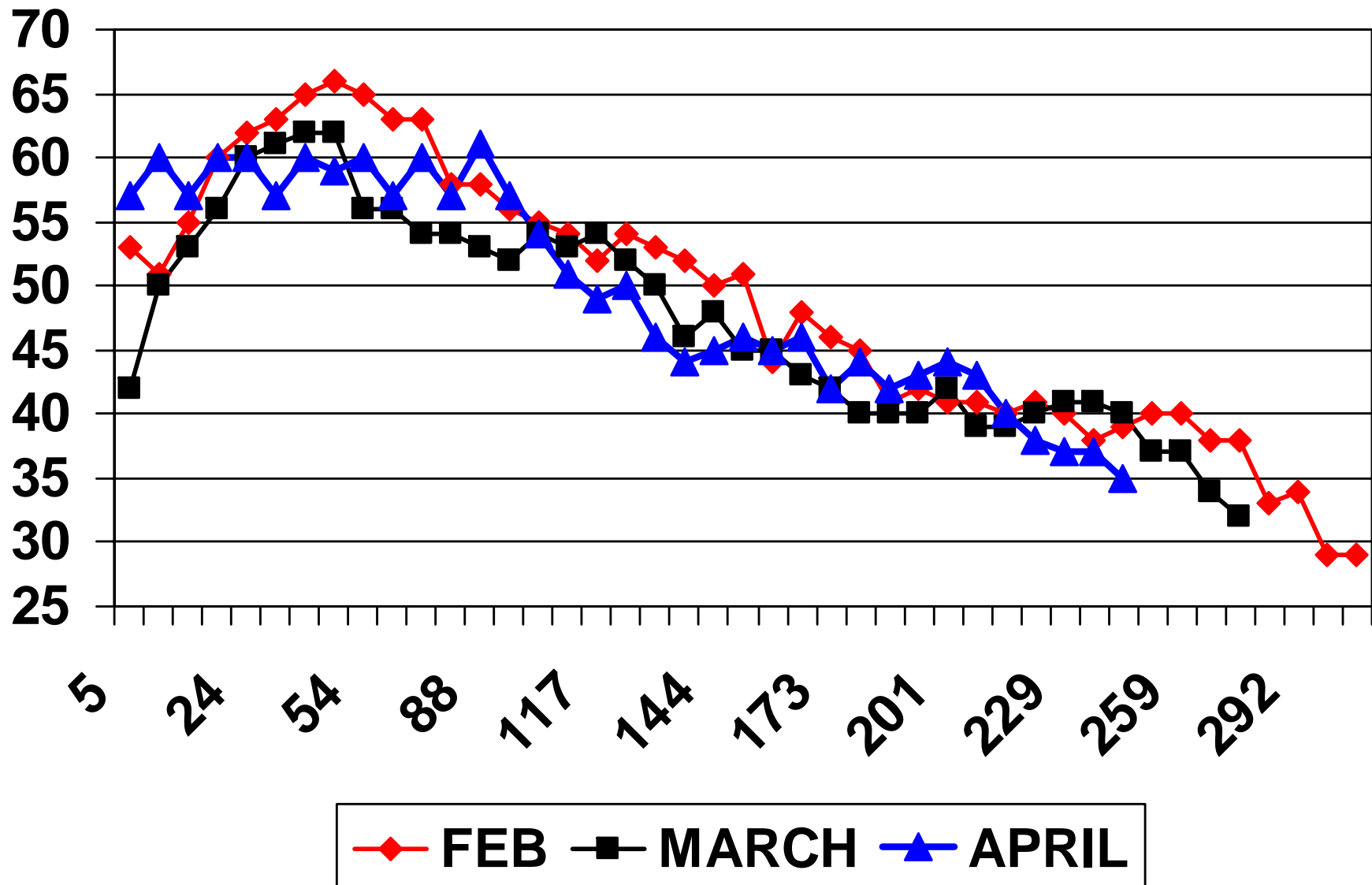
Capital Investments

- 1.11 tractor/loader
- .61 tractor
- 1.08 brush hog
- .22 skidsteer
- 1.05 truck
- .64 manure spreader
- .28 blade
- .25 post hole digger
- .58 mower/haybine
- .5 rake
- .38 baler
- .64 ATV
- .25 seeder
- .08 bale wrapper
- .47 wagon
- .42 trailer
- .22 bale grabber
- .33 tillage equipment

Investment less than \$70,000

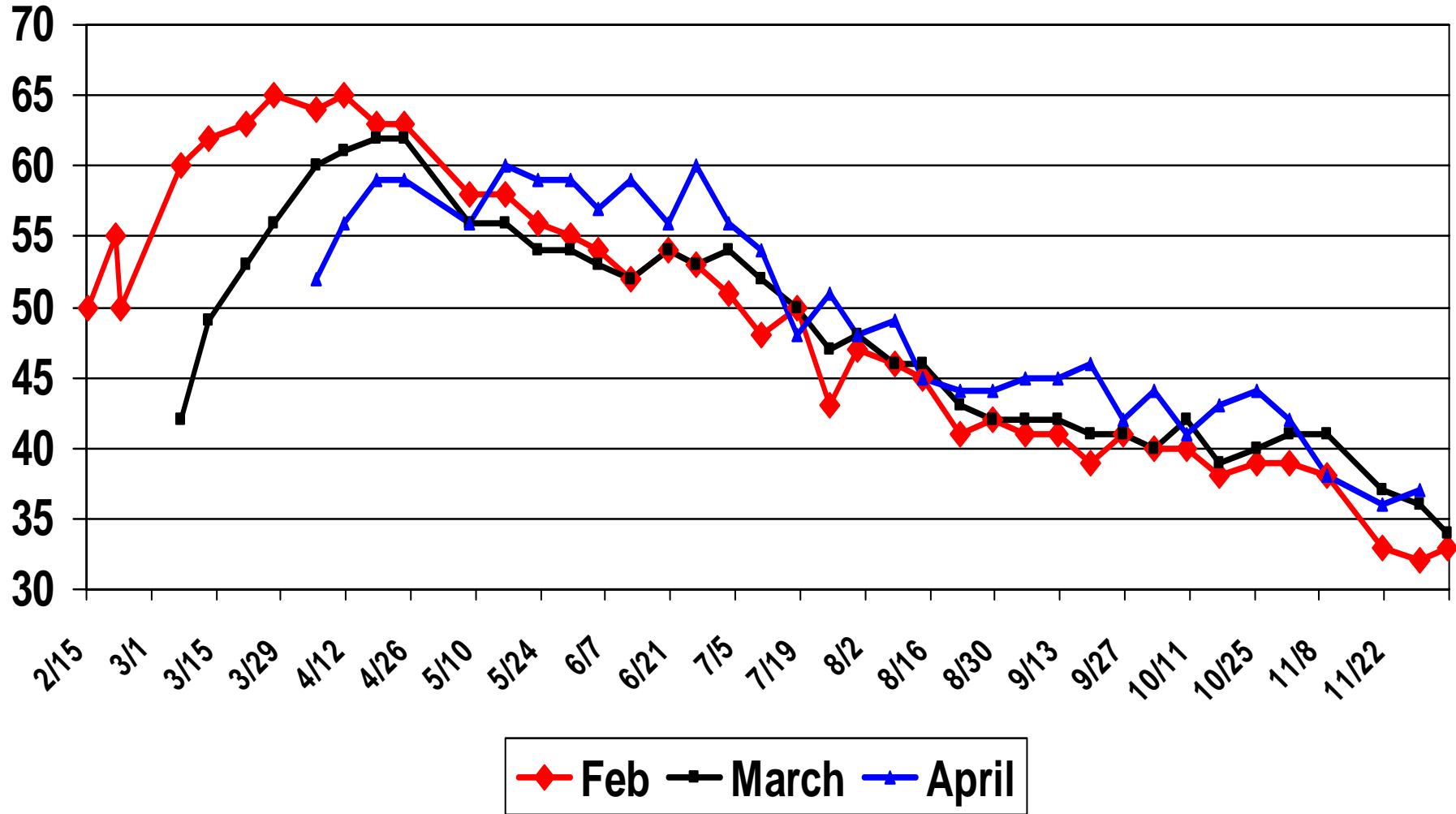
Lactation Curve by DIM

cows calving in Feb, March and April



Lactation Curve by month

cows calving in Feb, March and April



When to calve?

- Feb calvers produce 3480# more milk before mean calving date of April calvers
- Feb calvers produce 2552# more milk overall versus mean calving date of April calvers
- Additional Costs
 - Around \$180
 - Additional income \$331
 - Advantage of \$151
 - Advantage of rebreeding schedule



So what are the Opportunities of Pasture-based Dairying in Missouri?

- Existing infrastructure
 - Grazing dairies
 - Research Centers
 - Industry
- Multiple forage species
- Forage feed cost
 - 2-2.75 cents per DM pound
- Southeast milk order
- Weather
 - 60-70 days summer
 - 60 days winter
- Location and land price