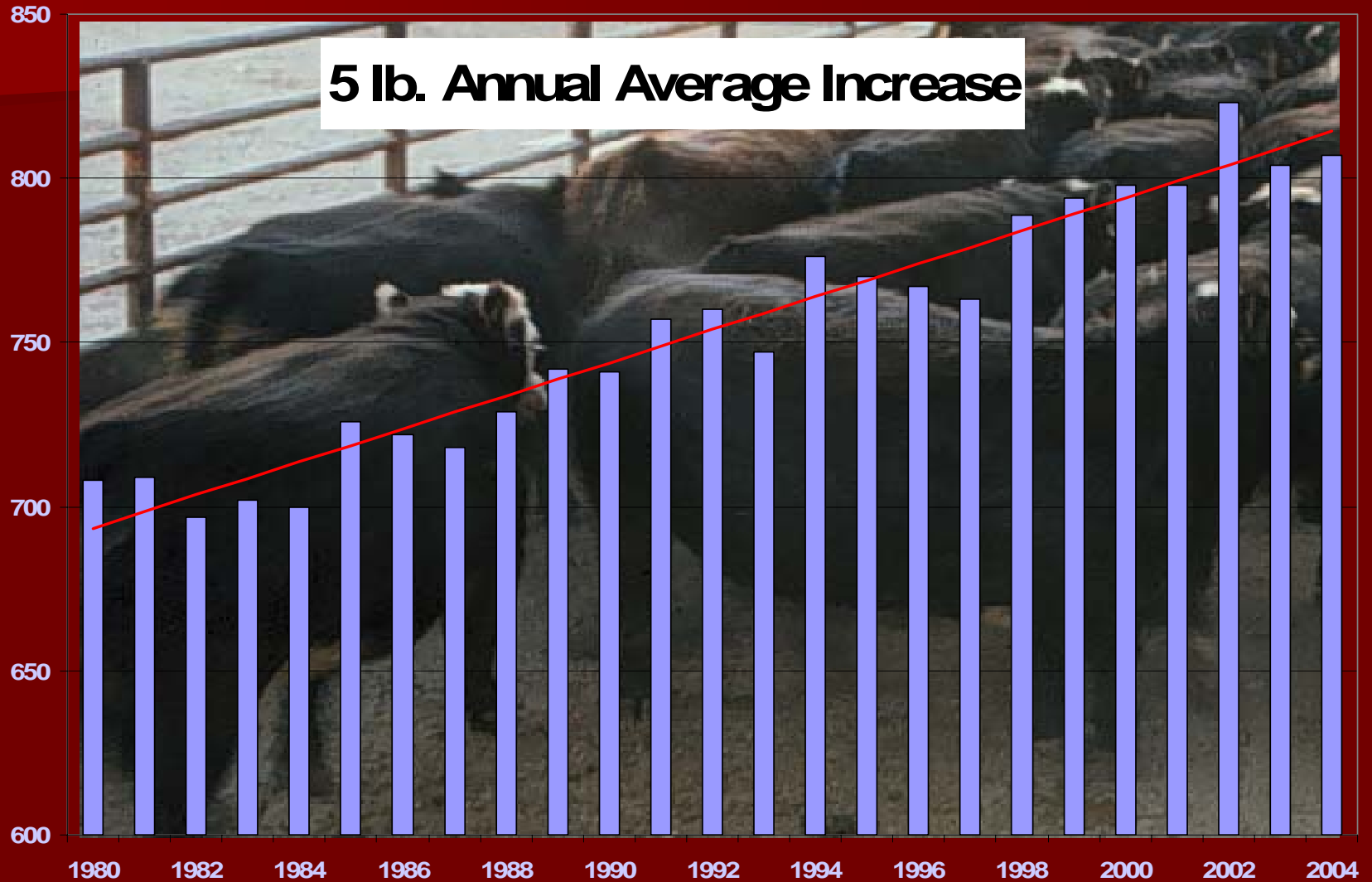


The Economics of Carcass Weight: A Weighty Matter for the Cattle Industry

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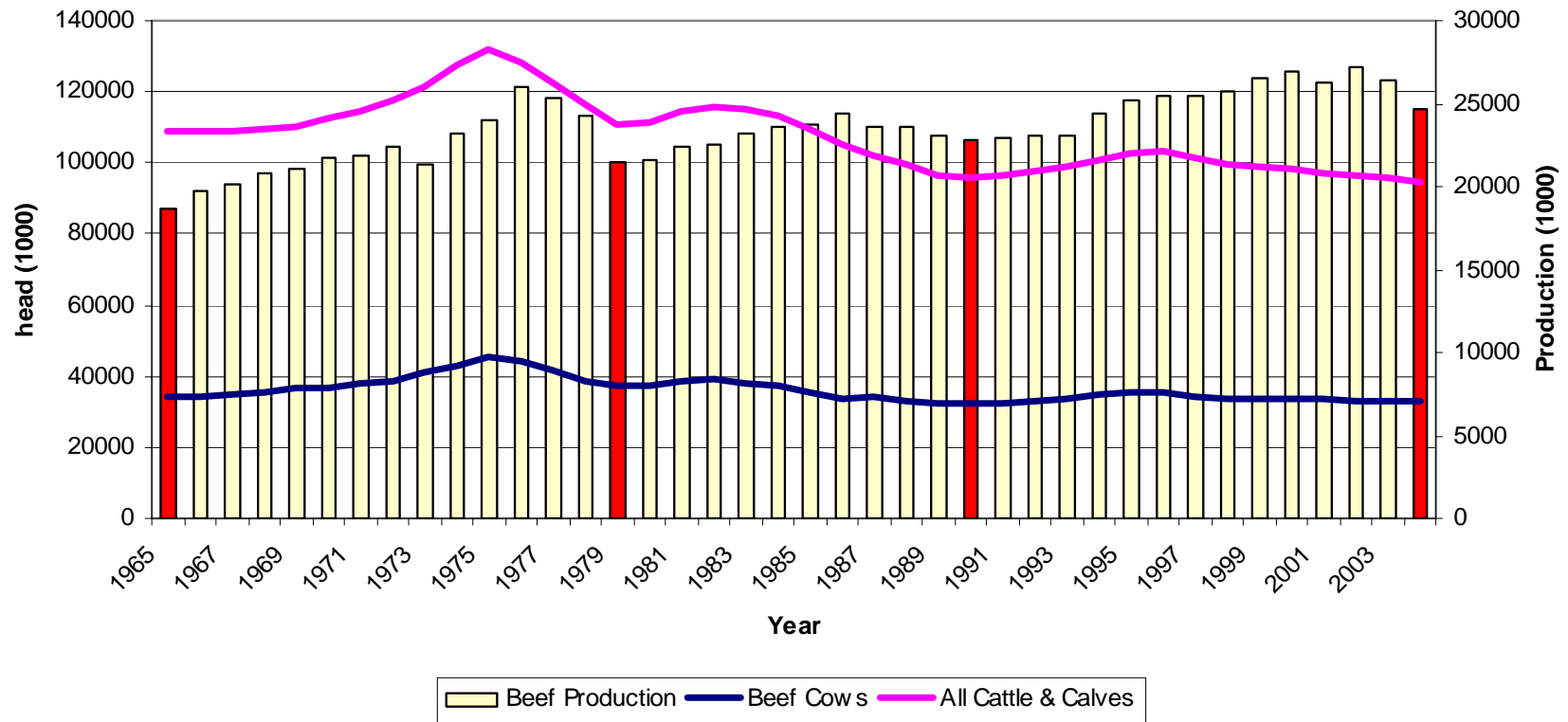
2005 WAEA Annual Meeting
San Francisco, CA

Steer Carcass Weight



Beef Industry Productivity Finished Weights

Inventory vs Production



Objectives

- Identify Producer Incentives to Add Weight
- Determine Industry Impact of Added Weight
- Determine Optimal End Weight

Producer Incentive

- Classical Production Theory
- Add weight up to the point where the Marginal Cost of the additional weight is Equal to the Marginal Revenue of the additional weight

3 Pricing Methods

- Live Weight
 - Dressed (Carcass) Weight
 - Grid
-
- Pricing method impacts Marginal Cost and Marginal Revenue
 - May therefore impact optimal end weight

Live Weight Pricing

- All Cattle in Pen receive same price
- Over large weight range (1100-1400 lbs) or greater, $MR = \text{Average Market Price}$
- $MC = f(\text{ADG}, \text{Feed/Gain}, \text{Feed Cost})$
- $\text{ADG} \ \& \ \text{Feed/Gain} = f(\text{Final Weight})$
- MC increases with additional weight
 - At what rate?



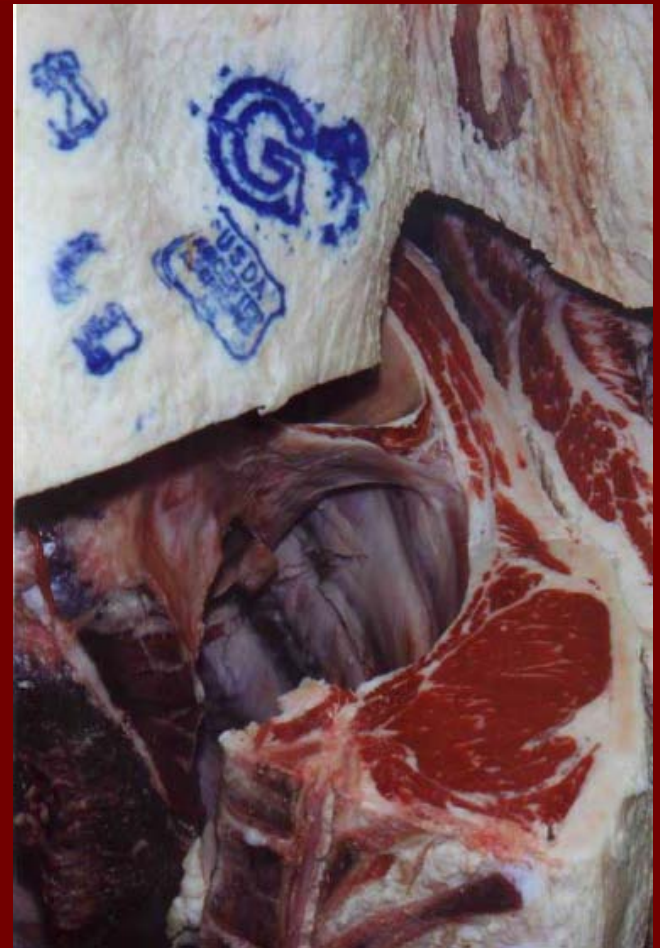
Dressed Weight Pricing

- All Cattle in Pen receive same price
- Over large weight range (550-950 lbs) or greater, MR=Average Market Price
- $MC = f(\text{ADG}, \text{Dressing } \%, \text{Feed/Gain}, \text{Feed Cost})$
- $\text{ADG}, \text{Dressing } \% \ \& \ \text{Feed/Gain} = f(\text{Final Weight})$
- Does MC increase with additional weight?



Grid (Carcass Merit) Pricing

- Each Carcass individually Priced
- $MR = f(\text{Carcass weight, Yield \& Quality Grade})$
- $MC = f(\text{ADG, Dressing \%}, \text{Feed/Gain, Feed Cost})$
- $\text{ADG, Dressing \%}, \text{Feed/Gain, YG \& QG} = f(\text{Final Weight})$
- How Do MR & MC change with additional weight?



Example Grid

Prices in \$/cwt Carcass

	YG 1	YG 2	YG 3	YG 4	YG 5
Prime	8.00	7.00	6.00	-14.00	-19.00
CAB	3.00	2.00	1.00		
Choice	2.00	1.00	Base	-20.00	-25.00
Select	-5.00	-6.00	-7.00	-27.00	-32.00
Standard	-20.00	-21.00	-22.00	-27.00	-32.00
Lt & Hy Weight	-20.00				

Data & Procedures

- Data from 8 serial slaughter experiments
- Standardized the data to 0 days at 1100 pounds of live weight
- OLS Regression to determine impact of added days on feed (added weight) on variables of interest

Data Summary

8 trials (16-27 data points)

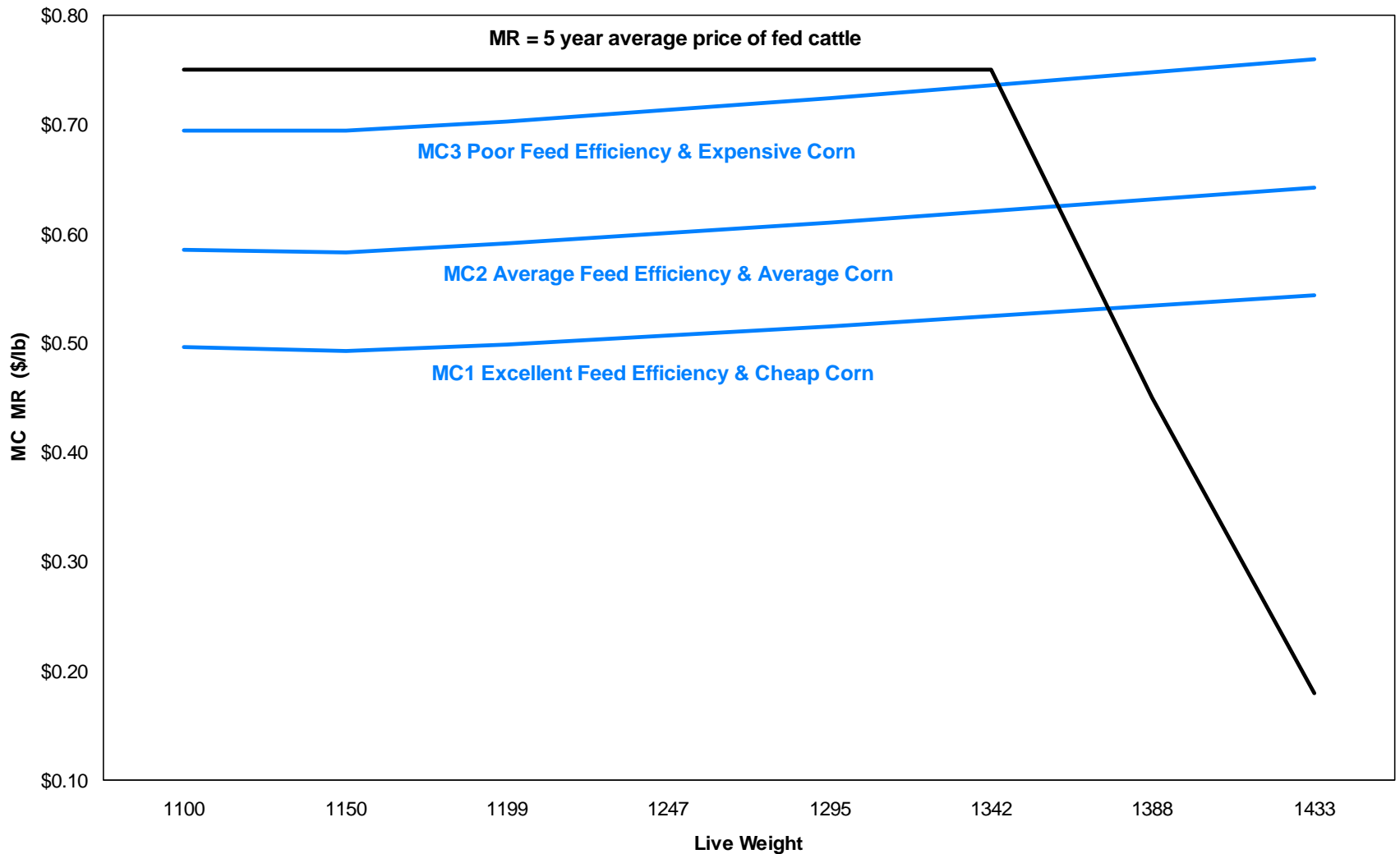
	Mean	Min	Max
Days	34	-12	113
ADG _{live}	3.46	2.80	4.12
ADG _{carcass}	2.67	2.21	3.79
Feed/Gain	5.88	5.23	6.47
Dressing %	64.15	61.60	67.00
Fat	0.52	0.14	0.83
Marbling	424	372	472
Yield Grade	2.88	2.12	4.00

Regression Results

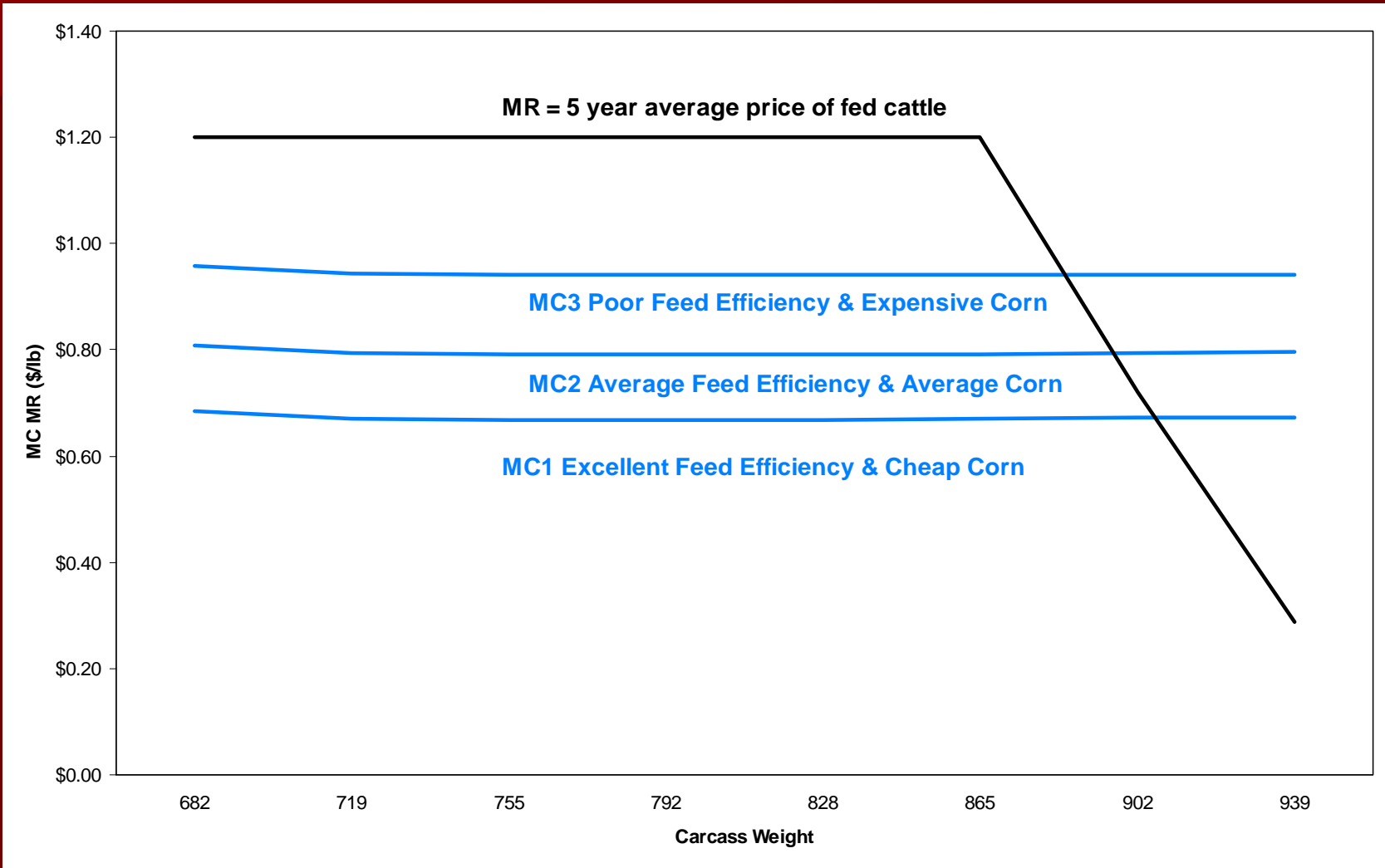
Independent Variable=Days

Dependent Variable	Significant Impact	Coefficient	2 wk 50 lb Coefficient
ADG _{live}	- Linear	-0.003	-0.047
ADG _{carcass}	None		
Dressing %	+ Linear	0.036	0.499
Feed/Gain	+ Linear	0.008	0.118
Fat	+ Linear	0.004	0.051
Marbling	Quadratic	1.761 -0.010	15.814
Yield Grade	+ Linear	0.015	0.211

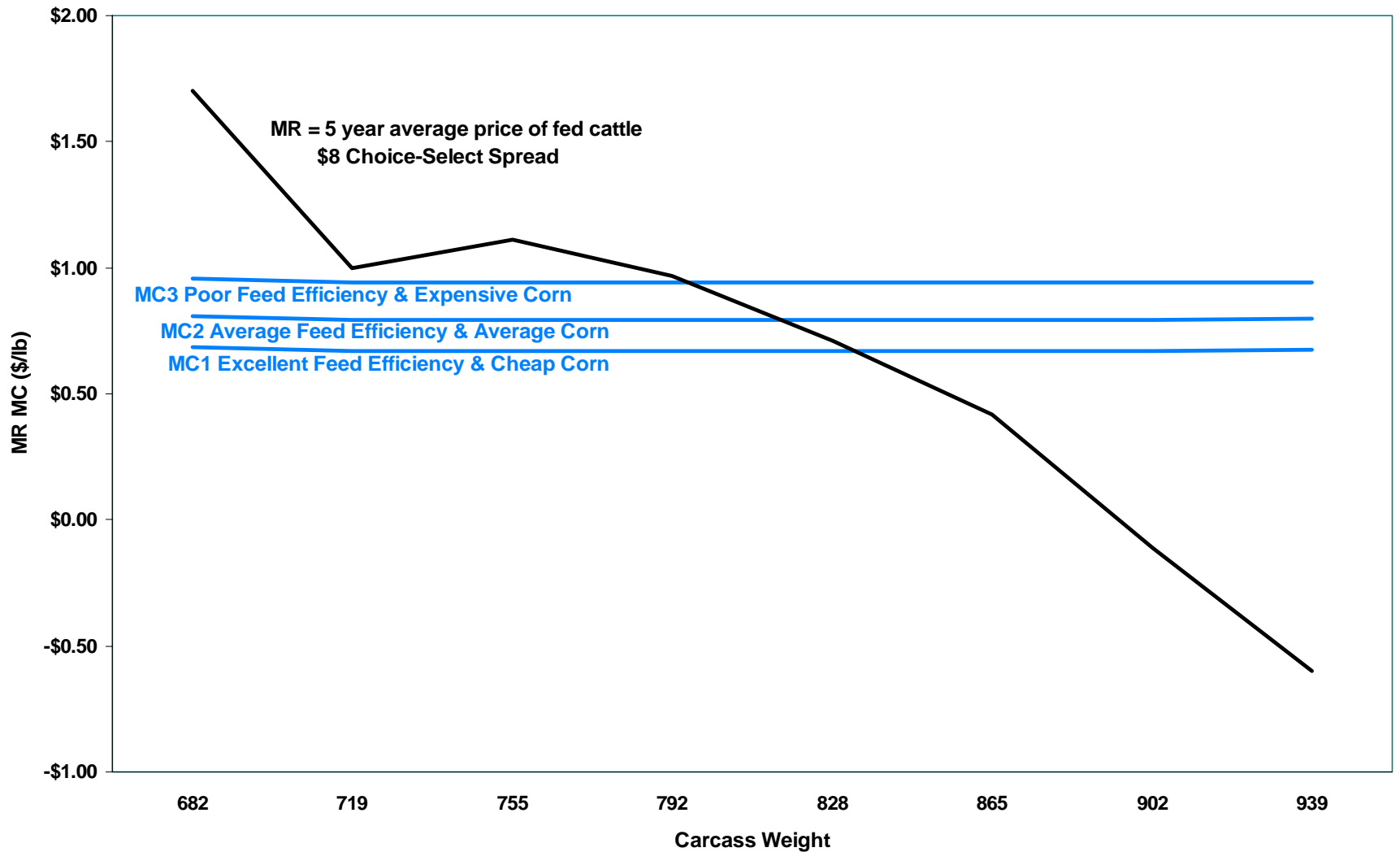
Live Weight Decision Rule



Dressed Weight Decision Rule



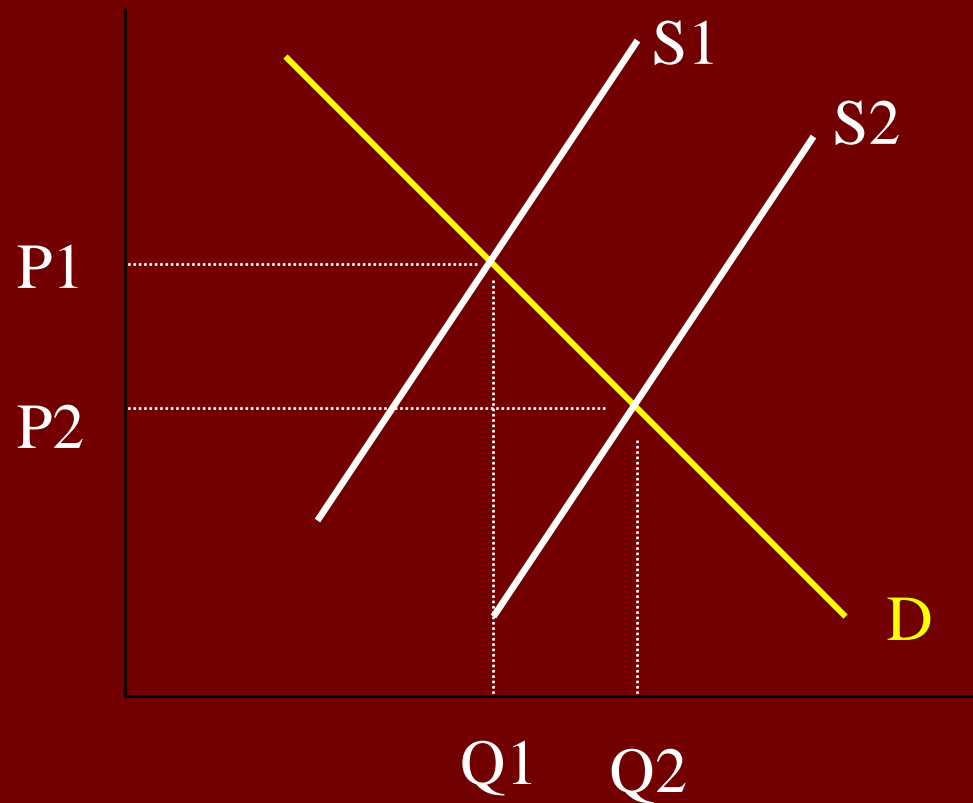
Grid Price Decision Rule



Summary Producer Incentive

- Current Weight (1300 Live 820 Carcass)
- Economic incentive to add another 50 lb if selling live weight
- Economic incentive to add another 60-80 lb if selling dressed weight
- Economic incentive to sort and increase weights if selling on a grid

Industry Impact Increased Supply



Industry Impact Increased Supply

- How much does price decrease when supply increases?
- Price Flexibility =
$$\frac{\% \text{Change Price}}{\% \text{Change Quantity}}$$
- Previous Economic Estimates
- -1.4 to -2.5%

Industry Impact

- 1250 to 1300 pound live weight increase
- A 4% increase in supply
- Would lead to a 5.6 to 10% decrease in price

- On a \$75 fed cattle market that is a decrease of \$4.20 to \$7.50 per cwt.

Industry Impact

- 1250 lb Steer X \$75/cwt = \$938
- 1300 lb Steer X \$70/cwt = \$910
- Gross Return \$-28
- Less Cost of Gain
- 50 lbs X \$.60/lb = \$30

- Net Loss \$58 per head

Implications

- Individually the best decision is to feed to heavier weights
- Collectively added weight decreases price and decreases net return

- Is there a solution?
- Micro – Macro Paradox in Agriculture

Beef– Its what's for dinner

