

Value Based Marketing of Cattle

Feuz Market Analysis

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Presentation Overview

Feuz Market Analysis

- What is Value based pricing?
- Provide pricing examples
- What is being rewarded/discounted?

Packer Bid Process

Feuz Market Analysis

- Profit = Total Revenue - Total Cost
- Profit/head = $[(P_{\text{meat}} \times Q_{\text{meat}}) + (P_{\text{byproducts}} \times Q_{\text{byproducts}})] - [(P_{\text{cattle}} \times Q_{\text{cattle}}) - \text{Costs}]$
- Bid Price_{cattle} = $[(P_{\text{meat}} \times Q_{\text{meat}}) + (P_{\text{byproducts}} \times Q_{\text{byproducts}}) - \text{Costs} - \text{Profit Target}] / Q_{\text{cattle}}$
- Price of meat = f(quality grade)
- Quantity of meat = f(yield grade, dressing %)

Marketing Methods

Live Weight

Feuz Market Analysis

- Average price based on live animal weight
- All cattle in pen receive the same price
- All cattle in several pens may receive the same price (show list pricing)
- Buyer estimates carcass weight (dressing %)
- Buyer estimates quality grade and yield grade
 - Quality Grade (Prime, Choice, Select, Standard)
 - Yield Grade (1-5)

Live Weight Marketing

Feuz Market Analysis



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Marketing Methods

Dressed Weight

Feuz Market Analysis

- Average price based on actual carcass weight
- Seller bears risk of (dressing %)
- All cattle in pen receive the same price
- All cattle in several pens may receive the same price (show list pricing)
- Buyer estimates quality grade and yield grade
 - Quality Grade (Prime, Choice, Select, Standard)
 - Yield Grade (1-5)

Marketing Method

Value Based Marketing

Feuz Market Analysis

- Price based on individual animal carcass merit
 - Quality Grade
 - Yield Grade
 - Conformance
- Seller bears risk of Dressing Percent
- Seller bears risk of quality grade & yield grade

Carcass Merit Pricing

Feuz Market Analysis

Quality Grades

Marbling
Maturity

Yield Grades

Fat
Muscling
Weight



Example Grid

Prices in \$/cwt Carcass

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	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
Non-Conforming	-20.00				

Premiums

Feuz Market Analysis

- **Yield Grade 1 & 2**
 - **Generally Fixed**
 - **\$0-6**
- **Prime and Upper 2/3 Choice**
 - **Generally Fixed**
 - **\$0-15**

Discounts

Feuz Market Analysis

- **Select**
 - **Varies with market conditions**
 - **\$0-18**
- **Standard or No Roll**
 - **Generally fixed from Select**
 - **\$5-20**
- **Yield Grade 4 & 5**
 - **Varies with market conditions**
 - **\$10-25**

Discounts

Feuz Market Analysis

- **Light Weight or Heavy Weight Carcasses**
 - Less than 550 or greater than 950-1000 lbs.
 - Generally fixed
 - \$10-25
- **Out Cattle**
 - Dark cutters, bullocks, hard bones
 - Generally fixed
 - \$15-25

Alternative Base Prices

More Important than Premiums/Discounts

Feuz Market Analysis

- Based on Plant Averages
- Base on other markets
 - Last Week's Cash
 - Futures Market
 - Box Beef
- Negotiated

Plant Average Base Prices

\$8 Choice-Select Spread \$100 Dressed Price

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	Plant A 50% Choice	Plant B 75% Choice	Pen of Cattle
Prime +\$6	\$110	\$108	2%
CAB +\$1	\$105	\$103	8%
Choice	\$104	\$102	55%
Select	\$96	\$94	33%
Std -\$10	\$86	\$84	2%

Plant A Net Price = \$101.20

Plant B Net Price = \$ 99.20

Plant Average Base Prices

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- Same pen of cattle valued differently at different plants
- Value is established relative to other cattle
- Creates mistrust between cattle producers and packers

Formula Base Prices

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- Are not negotiated
- Do not contribute to price discovery
- Add to “Captive Supplies”

Do you know the value of your feeder cattle?

Feuz Market Analysis

- **Feedlot Performance**
- **Carcass Merit**

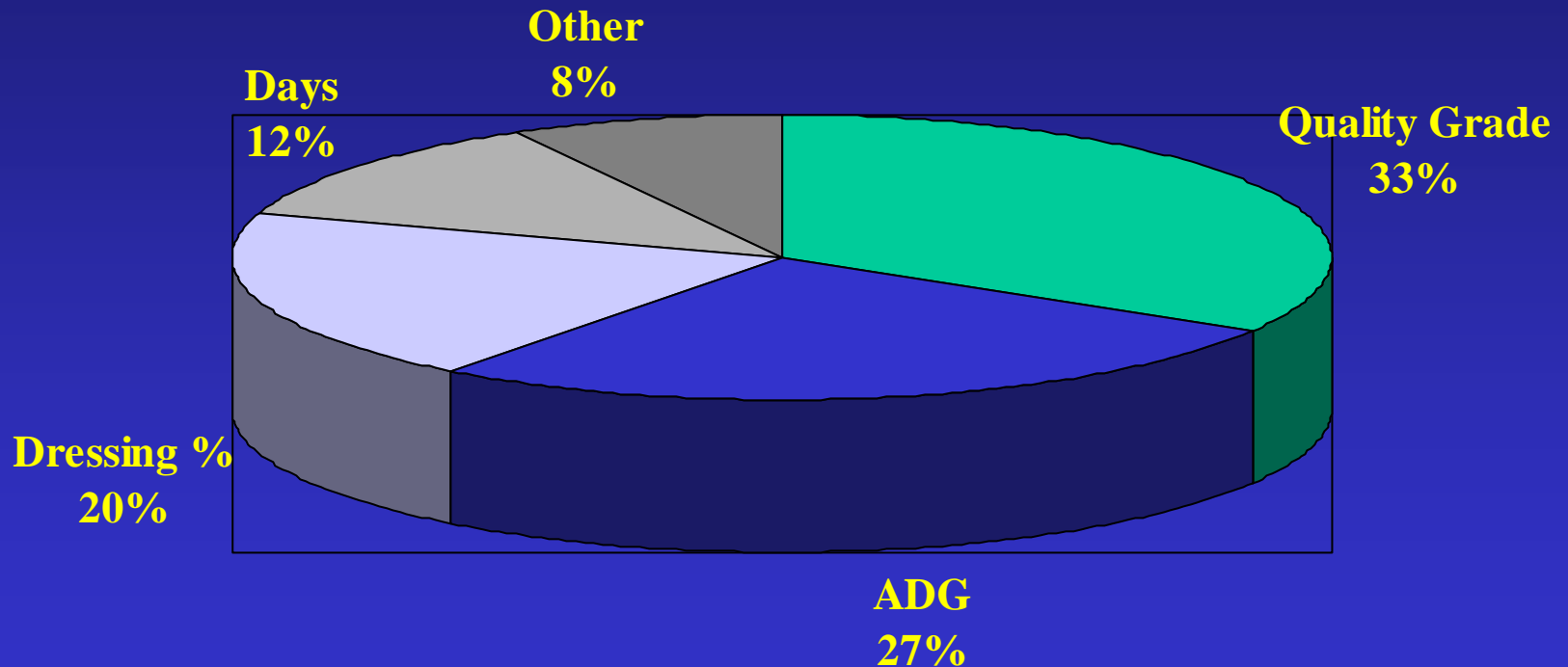
Performance Example

Feuz Market Analysis

	Profit	ADG	Final Weight	Dress Percent	% Choice
Low 1/3	-\$3.33	2.78	1097	62.7	20.3
Middle 1/3	\$50.14	3.06	1135	63.6	45.0
High 1/3	\$99.29	3.20	1179	64.9	66.8

Performance Example

Feuz Market Analysis



Pricing Example

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- **10 pens of calf fed steers**
- **Angus sired - black hided**
- **Fed at one feedlot**
- **Sales simulated over 2 time period**
 - **2 grids**
 - **dressed price**
 - **live price**

Carcass Characteristics

Feuz Market Analysis

	Average	Maximum	Minimum
Live Weight	1115	1147	1048
Carcass Weight	694	721	661
Dressing Percent	62.2	64.0	59.6
Percent Choice	61.7	77.1	44.1
Yield Grade	3.0	3.4	2.8

Revenue Comparison

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Period 1

Period 2

Pricing Method	Average Revenue	# of pens most profitable	Average Revenue	# of pens most profitable
Grid A	764.59	1	765.26	2
Grid B	771.09	3	762.87	1
Dressed	764.30	4	761.59	3
Live	755.38	2	768.42	4

Pricing Example

Feuz Market Analysis

6 Pens of Cattle (Net Grid Prices, \$/cwt)						
%Choice	%YG1-2	%Outs	HCW	Com Grid	YG Grid	QG Grid
80	62	4	658	\$103.57	\$103.37	\$103.90
81	37	0	749	\$103.10	\$102.80	\$103.17
58	72	0	745	\$101.78	\$102.47	\$101.24
60	37	0	776	\$101.63	\$101.55	\$101.39
30	92	14	842	\$97.52	\$99.20	\$95.84
16	79	36	875	\$93.69	\$95.72	\$91.55

Research Question

Feuz Market Analysis

- What economic signals are being sent to producers who are selling on alternative value based “grid” pricing systems?
- 3 value based pricing systems analyzed over 6 marketing dates

Methodology

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$$\text{Profit}_{\text{Showlist}} = \text{Dressed Price} \times \text{Dressed Weight} \\ - \text{Feeding Costs} - \text{Feeder Price} \times \text{Feeder Weight}$$

$$\text{Profit}_{\text{Grid}} = \text{Grid Price } f(\text{Carcass Characteristics}) \times \text{Dressed Weight} \\ - \text{Feeding Costs} - \text{Feeder Price} \times \text{Feeder Weight}$$

$$\text{Grid Price} = \text{Dressed Price} \\ + \text{Price Premium/Discount } f(\text{Carcass Characteristics})$$

Methodology

Feuz Market Analysis

$$\text{Profit}_{\text{Grid}} - \text{Profit}_{\text{Showlist}} =$$

Price Premium/Discount $f(\text{Carcass Characteristics}) \times \text{Dressed Weight}$

Profit Differential

----- = Price Premium/Discount $f(\text{Carcass Characteristics})$

Dressed Weight

This is a short-run analysis

Methodology

Feuz Market Analysis

$$\text{Profit}_{\text{Grid}} - \text{Profit}_{\text{Showlist}} =$$

$$\begin{aligned} & [\text{Grid Price } f(\text{Carcass Characteristics}) \times \text{Dressed Weight } f(\text{Mgmt}) \\ & \quad - \text{Feeding Costs } f(\text{Mgmt}) \\ & \quad - \text{Feeder Price } f(\text{Mgmt}) \times \text{Feeder Weight } f(\text{Mgmt})] \end{aligned}$$

$$\begin{aligned} - & [\text{Dressed Price} \times \text{Dressed Weight } f(\text{Mgmt}) - \text{Feeding Costs } f(\text{Mgmt}) \\ & \quad - \text{Feeder Price } f(\text{Mgmt}) \times \text{Feeder Weight } f(\text{Mgmt})] \end{aligned}$$

This would be the long-run situation

Data

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- 85 pens of cattle (5,520 head)
- Individual carcass data
 - weight, marbling, fat, rib eye, KPH, outs
- Three different value based pricing systems
- Six different marketing dates
 - Choice - Select price spread

Prices & Grading

Feuz Market Analysis

	2/6/98	2/21/97	6/20/97	12/19/97	10/24/97	12/6/96
Nebraska Dressed Price	\$98.47	\$106.25	\$105.17	\$104.84	\$107.85	\$114.76
Choice-Select Carcass Spread	\$1.15	\$3.26	\$5.62	\$7.85	\$10.13	\$15.81
US Carcass % Grading Choice	63.58	52.71	48.75	51.86	45.34	44.44
USDA Rg7-8 % Grading Choice	61.30	59.68	54.49	57.75	55.63	52.35
USDA Rg7-8 % Yield Grade 1-2	50.70	55.59	55.54	54.50	49.13	56.42
USDA Rg7-8 % Yield Grade 4-5	1.56	1.09	1.16	1.00	1.19	1.01

Premiums & Discounts

(\$/cwt.)

Feuz Market Analysis

	2/6/98	2/21/97	6/20/97	12/19/97	10/24/97	12/6/96
Nebraska Dressed Price	98.47	106.25	105.17	104.84	107.85	114.76
Grid A Base	99.47	107.25	106.56	106.8	111.27	120.25
Average Premium/Discount	0.80	-0.14	-0.67	-0.97	-0.40	-0.55
Maximum Premium/Discount	4.61	4.18	4.47	4.94	6.29	8.11
Minimum Premium/Discount	-9.22	-11.13	-12.72	-14.02	-14.47	-17.17
Grid B Base	98.99	106.77	105.69	105.36	108.37	115.28
Average Premium/Discount	0.99	-0.03	1.36	1.00	1.53	2.37
Maximum Premium/Discount	3.04	2.69	4.09	4.56	5.65	8.43
Minimum Premium/Discount	-5.18	-8.38	-6.82	-8.57	-8.68	-10.30
Grid C Base	98.47	106.25	105.17	104.84	107.85	114.76
Average Premium/Discount	0.99	1.79	3.47	1.00	1.08	1.13
Maximum Premium/Discount	2.59	3.42	8.00	4.82	5.78	7.79
Minimum Premium/Discount	-4.24	-3.49	-5.56	-7.36	-8.18	-10.68

Procedure

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$$VBP = b_0 + b_1 \text{Marbling} + b_2 \text{Marbling}^2 + b_3 \text{Marbling}^3 + b_4 \text{Fat} + b_5 \text{Fat}^2 + b_6 \text{Ribeye} + b_7 \text{KPH} + b_8 \text{Weight} + b_9 \text{Out} + e$$

Estimated this equation for each grid and each time period
Used Seemingly Unrelated Regression Procedure
to correct for contemporaneously correlated errors across grids

Regression Results

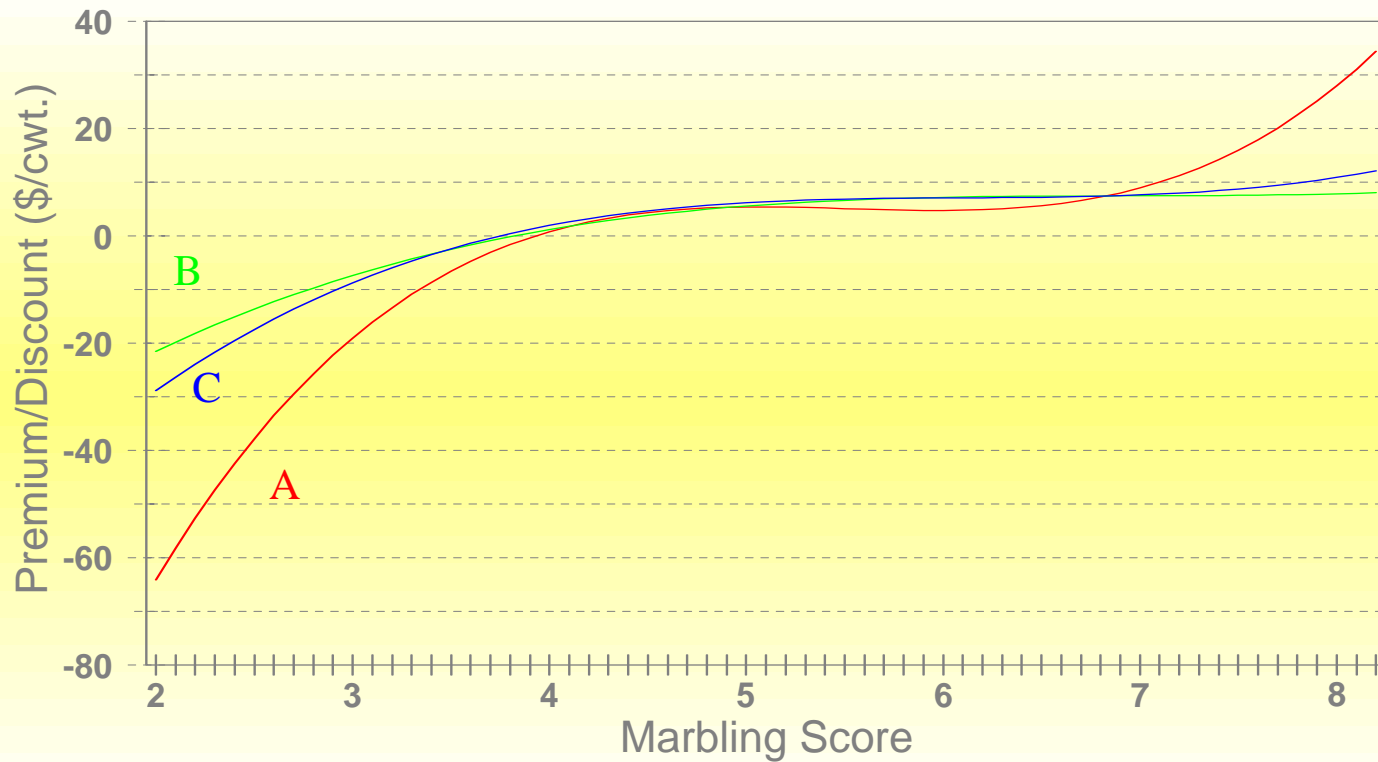
Marbling

Feuz Market Analysis

- Significant, Positive, Non-linear
- Varies across grid
- Varies over time

Impact of Marbling on Premiums/Discounts

Feuz Market Analysis

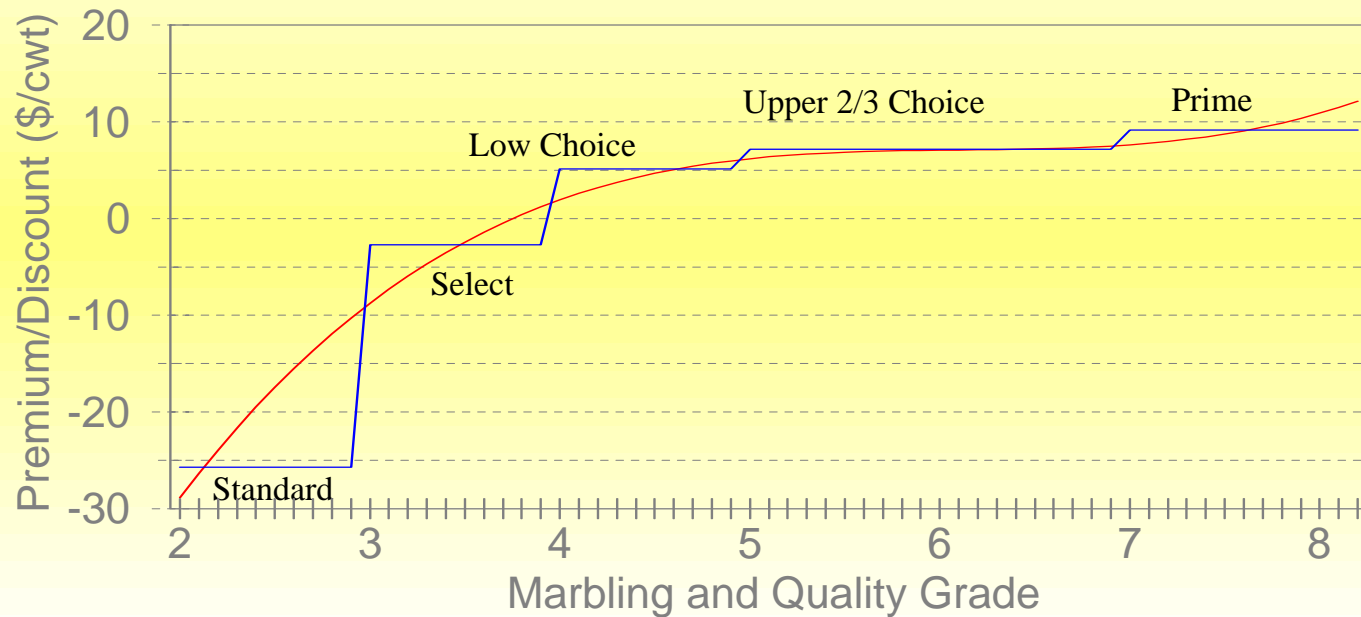


Current Grading System

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Impact of Marbling on Price

Predicted Response vs Grid Prices



Regression Results

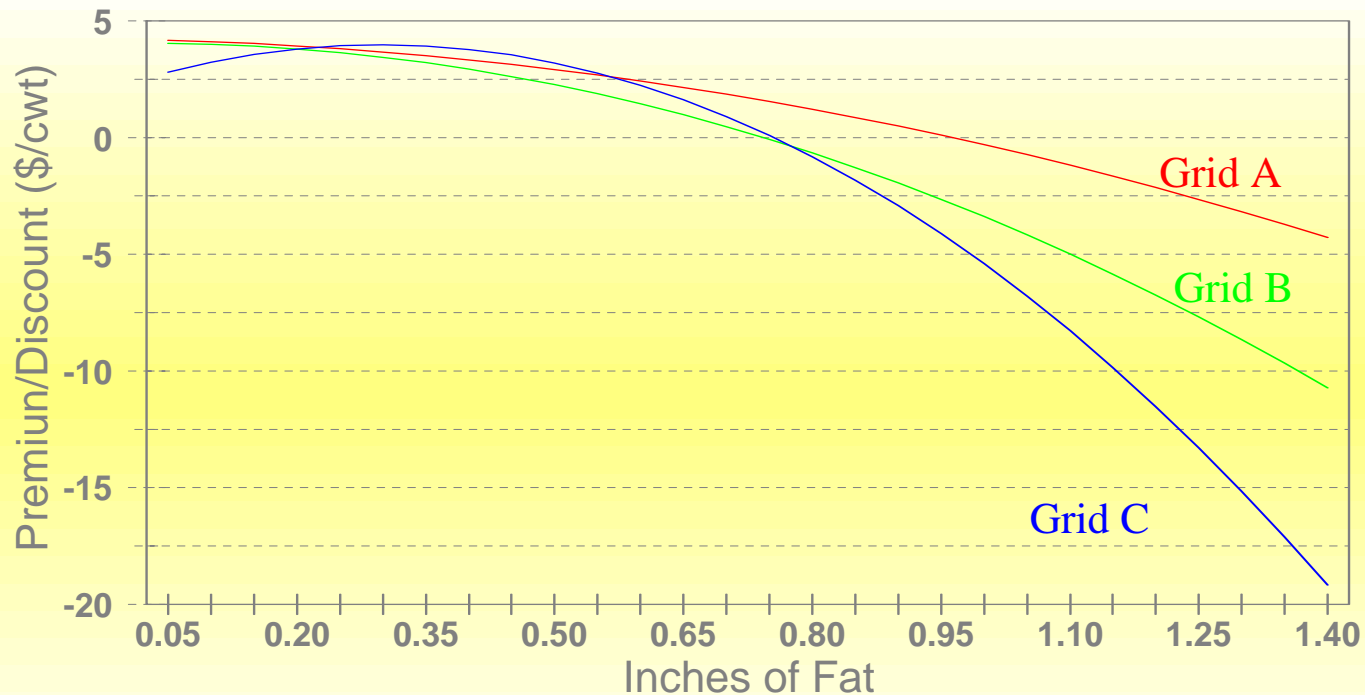
Fat Thickness

Feuz Market Analysis

- Significant, Negative, Non-linear
- Fairly stable over time
- Varies across grids

Impact of Fat on Premiums/Discounts

Feuz Market Analysis



Regression Results

Rib Eye Area

Feuz Market Analysis

- Significant (grid B & C), Positive
- Stable over time
- Varies across grid

Regression Results

Kidney-Pelvic-Heart Fat

Feuz Market Analysis

- Non-Significant

Regression Results

Carcass Weight

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- Statistically Significant (some of the time)
- This analysis looked at Price Differences, not Revenue or Profit Differences
- Carcass Weight very important in Revenue and Profit comparisons

Regression Results

Out Cattle (Non-Conformance)

Feuz Market Analysis

- Significant, Negative
- Stable over time
- Grid B different than Grids A & C

Summary

Feuz Market Analysis

- Are value based pricing systems the answer?
 - They do send the appropriate signals
 - Signals vary over time and across systems
- Increase risk to cattle sellers
- If base is not negotiated, contributes to captive supply