Livestock Marketing

- Size and trends in meat markets
- Farmer marketing decisions
  - When to sell
  - Where to sell
  - What to sell
- Buying feeder livestock

Livestock Markets 2003

<table>
<thead>
<tr>
<th></th>
<th>Billion lbs(^1)</th>
<th>Per Cap lbs(^2)</th>
<th>Price $/cwt</th>
<th>Export %</th>
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<tbody>
<tr>
<td>Beef</td>
<td>26.2</td>
<td>64.8</td>
<td>84.69</td>
<td>9.6</td>
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<tr>
<td>Pork</td>
<td>20.0</td>
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<td>39.45</td>
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<td>Broilers</td>
<td>32.7</td>
<td>81.4</td>
<td>62.00</td>
<td>15.1</td>
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<td>Turkeys</td>
<td>5.7</td>
<td>17.4</td>
<td>62.10</td>
<td>8.5</td>
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</table>

\(^1\)/ Billion carcass pounds of US production
\(^2\)/ Retail pounds consumed per person per year

Retail Per Capita Meat Consumption

- Beef
- Pork
- Chicken
- Turkey
Measuring consumption

- Balance sheet approach
  - Beginning inventories
  - + Production
  - + Imports
  - - Exports
  - - Ending inventory
  - = Disappearance
- Per Capita consumption = Disappearance / Population
- A measure of quantity supplied rather than quantity demanded
**Livestock Marketing Decisions**

- **When to sell**
  - Weight, grade, costs
- **What to sell**
  - Live, carcass, grid
- **Where to sell**
  - Type of market
  - Location
When to sell

- Classic production function
  - Optimal selling weight is where MC = MR
  - The cost of the next pound = the price of the next pound
- Cost per pound decrease then increase with weight
  - Costs are a function of
    - Genetic potential
    - Cost of diet
    - Opportunity costs of future production
- Price per pound increases then decreases
  - Weight discounts outside optimal range
  - Fatter carcasses are discounted
  - Adding extra weight

- Marginal Revenue
  - Uncertain about price if you wait to sell (price trends)
  - Typically animals increase the portion of fat relative to muscle produced as they get heavier.
  - There is an optimal weight range by packers
    - Discounts if too light or too heavy
  - Optimal degree of “finish”
    - Different for hogs versus cattle
    - Both can be too fat
When to sell

- MC increases at an increasing rate as the animal nears the optimal market time
  - Function of animal efficiency related to genetics
  - Is impacted by feed prices
    - For the same efficiency the MC is higher if feed is 10 cents per pound than when feed is five cents per pound.
When to sell

- Marginal Revenue
  - MR increases then decreases due to premiums and discounts associated with grades
  - Is also a function of seasonal price trends that could be higher or lower

Hog Carcass Weight Discounts ($/cwt)

Average of the reported range of price discount for carcass weights.

Hog Carcass Upper and Lower Price by Backfat Thickness in Inches for 7.0 sq in Loin Eye, ISM, Aug 26, 2005

5-Day Rolling Average Market Hog: 193.50 lb carcass, 0.75 inch back-fat, 6.90 square inch loin/2.30 inch loin depth, FFLI: 51.28%
Hog Carcass Upper and Lower Prices by Loin Eye Area for 0.7 Inches of Backfat, ISM August 26, 2005

Seasonal Price Index for Iowa Fed Cattle and Hogs

When to sell

- Complicated decision based on
  - Season
  - Current leanness and efficiency
  - Packer buying program
- Also influenced by
  - Production schedule
  - Cost of replacement animal
Where to sell

- Terminal markets have declined
- Auction markets important when assembly is needed
  - Feeder cattle and cull cows
  - Growing interest in fed cattle in fringe areas
- Direct sales
  - Slaughter cattle and hogs
  - Feeder pigs
  - Growing in feeder cattle where source verification is important

Slaughter Cattle and Hogs

- Direct sales most common
  - Animals are delivered directly to the packing plant
- Spot or cash market
  - Seller contacts buyer when ready to sell
  - Negotiate price and terms on each group
- Contract market
  - May be for one group or an ongoing agreement between buyer and seller
  - Terms and pricing method determined ahead of marketing date

<table>
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<tr>
<th></th>
<th>Negotiated</th>
<th>Other Market Formula</th>
<th>Swine or Pork Market Formula</th>
<th>Other Purchase Agreement</th>
<th>Total Wh</th>
<th>Avg</th>
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<td>HEAD COUNT</td>
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<td>LOWEST NET LOT</td>
<td>43.77</td>
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<td>198.97</td>
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<td>AVERAGE LOIN DEPTH (LD)</td>
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<td>2.47</td>
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<td>6.81</td>
<td>7.58</td>
<td>7.43</td>
<td>6.85</td>
<td>7.26</td>
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Producer Sold Hogs: Percent of Hogs Bought by Purchase Type

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<thead>
<tr>
<th>Year</th>
<th>Negotiated</th>
<th>Other Mkt Formula</th>
<th>Swine/pork Mkt Formula</th>
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<tr>
<td>2001</td>
<td>18%</td>
<td>18%</td>
<td>52%</td>
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<td>10%</td>
<td>49%</td>
<td>27%</td>
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<td>2004</td>
<td>11%</td>
<td>14%</td>
<td>52%</td>
<td>23%</td>
</tr>
<tr>
<td>2005</td>
<td>11%</td>
<td>16%</td>
<td>53%</td>
<td>21%</td>
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2001: May-Dec, 2005: Jan-Aug

Producer Sold Hogs: Price by Purchase Type Relative to the Average Price

<table>
<thead>
<tr>
<th>Year</th>
<th>Negotiated</th>
<th>Other Mkt Formula</th>
<th>Swine/pork Mkt Formula</th>
<th>Other Purchase Arrangement</th>
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<td>2001</td>
<td>100%</td>
<td>95%</td>
<td>100%</td>
<td>98%</td>
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<tr>
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<td>96%</td>
<td>112%</td>
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<td>2003</td>
<td>98%</td>
<td>102%</td>
<td>97%</td>
<td>105%</td>
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<td>2004</td>
<td>104%</td>
<td>91%</td>
<td>102%</td>
<td>99%</td>
</tr>
<tr>
<td>2005</td>
<td>104%</td>
<td>95%</td>
<td>101%</td>
<td>98%</td>
</tr>
</tbody>
</table>

2001: May-Dec, 2005: Jan-Aug

Feeder cattle sales

- Live weight sales
  - Various weight classes
  - In general, lower $/# and heavier weights
- Auction is major market
  - Assembly function important
- Video auctions
- Direct trade
- Premium paid for
  - Large uniform lots
  - Certification/verification ???????

Feeder pig sales

- Price/head or live weight
  - 40-60 pound classes
  - Weaned pigs (10-12 pounds)
- Primarily direct trade
  - Rapidly declining auctions
  - Health and stress concerns
- Premiums for
  - Large uniform, single source
  - Genetic history

<table>
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<tr>
<th>Year</th>
<th>EW</th>
<th>40</th>
<th>50</th>
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<tr>
<td>2000</td>
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<td>2003</td>
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</tr>
<tr>
<td>2004</td>
<td>40</td>
<td>35</td>
<td>30</td>
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</tbody>
</table>

Feeder pig sales

- Spot market price
  - Often through a broker
  - USDA report
- Formula pricing
  - Based on observable price
  - Spot market
  - Hog futures maybe corn and SBM
What to sell

- Live weight
  - One average price for all live pounds
  - Negotiated price before delivery or at auction
  - Weighing conditions important
    - Mud, shrink (fill, time, stress)
  - Was most common for hogs but not now
  - Still common in large cattle feedlots, less in Iowa
  - Used for feeder cattle and feeder pigs
What to sell

◆ Carcass weight (“in-the-meat”)
  • One average price for all carcass pounds
  • Negotiated price before delivery
  • Dressing percent (also called yield)
    » Important to compare bids
    » Not important in determining value
  • Farmer stands risk of trimming and condemnation
  • Common for fed cattle in Midwest

What to sell

◆ Dressing percent
  • DP = carcass weight / live weight
  • DP hogs approximately 73-76%
  • DP cattle approximately 61-64%
◆ DP impacted by:
  • Weighing conditions
  • Shrink
  • Fat thickness
  • Genetics

What to sell

◆ Value-based marketing
  • Each carcass evaluated and priced individually
  • Premiums and discounts determined ahead of delivery
  • Base price may be negotiated or come from formula
  • Carcasses are graded and values assigned
  • Farmer stands grading risk
  • Different buyers have different systems
  • Nearly all hogs
  • Increasingly popular for fed cattle
Value-based Hog Marketing

- Two factors impact premiums
  - Carcass weight and leanness
  - Fixed premiums (known dollar amount)
  - Relative premiums (percent adjustment)
- Not USDA graded
  - Packer employee measures
  - Objective measures
    - Fat-O-Meter, ruler, ultra-sound

### Hog Carcass Weight Discounts

<table>
<thead>
<tr>
<th>Carcass Weight</th>
<th>Range</th>
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<tr>
<td>145#</td>
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<td>155#</td>
<td>-27.70</td>
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<td>165#</td>
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<td>175#</td>
<td>-3.40</td>
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<td>185#</td>
<td>-1.36</td>
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<tr>
<td>195#</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td>205#</td>
<td>-3.00</td>
<td>1.36</td>
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<td>215#</td>
<td>-5.26</td>
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IOWA-MINNESOTA DAILY DIRECT NEGOTIATED HOG PURCHASE MATRIX
LM_HG204, Fri, Aug 26, 2005, USDA Market News Des Moines, Iowa

### Hog Carcass Price by Backfat and Loin Eye Area

<table>
<thead>
<tr>
<th>Backfat</th>
<th>4.0/1.4</th>
<th>5.0/1.7</th>
<th>6.0/2.0</th>
<th>7.0/2.3</th>
<th>8.0/2.7</th>
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<tr>
<td>0.40</td>
<td>62.00</td>
<td>75.00</td>
<td>75.00</td>
<td>75.00</td>
<td>76.00</td>
</tr>
<tr>
<td>0.50</td>
<td>59.50</td>
<td>75.00</td>
<td>75.00</td>
<td>75.00</td>
<td>76.00</td>
</tr>
<tr>
<td>0.60</td>
<td>59.50</td>
<td>75.00</td>
<td>75.00</td>
<td>75.00</td>
<td>76.00</td>
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<td>59.50</td>
<td>75.00</td>
<td>75.00</td>
<td>75.00</td>
<td>76.00</td>
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<td>0.80</td>
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<td>75.00</td>
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<td>76.00</td>
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<td>0.90</td>
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IOWA-MINNESOTA DAILY DIRECT NEGOTIATED HOG PURCHASE MATRIX
LM_HG204, Fri, Aug 26, 2005, USDA Market News Des Moines, Iowa
Comparing bids

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<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
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<tbody>
<tr>
<td>Price in appropriate $/cwt</td>
<td>$44.50</td>
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<tr>
<td>Bid Price (live)</td>
<td>$44.50</td>
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</tr>
<tr>
<td>Bid Price (carcass)</td>
<td>---</td>
<td>$59.50</td>
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<tr>
<td>Lean premium</td>
<td>---</td>
<td>+1.25</td>
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<tr>
<td>Sort discount</td>
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<td>-.70</td>
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<tr>
<td>Dressing percentage</td>
<td>74.5</td>
<td>74.5</td>
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<tr>
<td>Adjusted to live</td>
<td>44.50</td>
<td>44.73</td>
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<tr>
<td>Transportation</td>
<td>-.85</td>
<td>-.35</td>
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<tr>
<td>Net farm gate price</td>
<td>$43.65</td>
<td>$44.38</td>
</tr>
</tbody>
</table>

Value-Based Cattle Marketing

Three factor impact premiums
1. Carcass Weights
2. Quality Grade Distribution (USDA Grader)
   Based on marbling, proxy for eating experience
3. Yield Grade Distribution (USDA Grader)
   Based on lean meat yield
4. Other specs:
   Product safety & quality assurance
   Acceptable color
   Youthfulness

Percent of Beef Grading Prime, Choice, or Select

- Prime
- Choice
- Select
Beef Yield Grade Percentages

Value-Based Cattle Marketing

**Common Ground for Targets**

1. Carcass Weights 550 - 950 lbs
2. Quality Grade ≥ Se⁺ or ≥ Ch⁰
3. Yield Grade 1’s and 2’s

Carcass Merit Grid and Premium Trends

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<th>Quality</th>
<th>Yield Grade</th>
<th>Grade</th>
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<th>2</th>
<th>3</th>
<th>4 &amp; 5</th>
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<td>Prime</td>
<td>+$$$$$</td>
<td>+$$$$</td>
<td>+$$$</td>
<td>-$$</td>
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<tr>
<td>Choice⁺ and Choice⁰</td>
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<td>+$$</td>
<td>+$$</td>
<td>-$$</td>
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<tr>
<td>Choice⁺</td>
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<td>+$$</td>
<td>Base</td>
<td>-$$$</td>
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<tr>
<td>Select</td>
<td>-$$</td>
<td>-$$</td>
<td>-$$$</td>
<td>-$$ $$</td>
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<tr>
<td>Standard</td>
<td>-$$$</td>
<td>-$$$</td>
<td>-$$$</td>
<td>-$$ $$</td>
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<tr>
<td>Out Cattle</td>
<td>-$$$$</td>
<td>-$$$$</td>
<td>-$$$$</td>
<td>-$$ $$</td>
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<td></td>
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Where are the Grid Rewards & Discounts?
Iowa Quality Beef Grid 2005

- Base: NE Wted Avg 65-80% Choice
- Par: Ch YG3 =Base + $2.00 or Plant clean up which ever is greater
- Quality Grade $/cwt
  - Prime: $6.00
  - Certified Angus: $3.50
  - Select USDA
  - Standard - $15.00
  - Commercial - $30.00
  - Dark Cutters - $30.00
  - Other - $30.00
- Yield Grade $/cwt
  - 1: $4.00
  - 2: $3.00
  - 3: Par
  - 4: -$20.00
  - 5: -$25.00
- Carcass weights $/cwt
  - Under 500 - $40.00
  - 500-549 - $15.00
  - 950-999 - $8.00
  - 1000 & up - $35.00

Comparing Bids ($/carcass cwt)

<table>
<thead>
<tr>
<th>Price in appropriate $/cwt</th>
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<td>Prime</td>
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<tr>
<td>Top 2/3 Ch</td>
<td>45%</td>
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<tr>
<td>Select</td>
<td>30%</td>
<td>---</td>
</tr>
<tr>
<td>Yield 1&amp;2</td>
<td>60%</td>
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</tr>
<tr>
<td>Off weight</td>
<td>3%</td>
<td>---</td>
</tr>
<tr>
<td>Transportation</td>
<td>-65</td>
<td>-1.25</td>
</tr>
<tr>
<td>Net farm gate price</td>
<td>120.35</td>
<td>120.16</td>
</tr>
</tbody>
</table>

Bid A is a straight in the meat bid, Bid B is a valued-based bid.

Summary
- When to sell is complicated
  - Perishable, non-storable
  - Rising cost and changing value
- What to sell is complicated
  - Understanding shrink
  - Know what is under the hide
- Where to sell
  - Transportation
  - Buyer programs
  - Number of bidders
Making Pricing Decisions

- Regardless of what, when and where to sell the farmer must decide when to price.
- Typically, animals priced at delivery
- Can be priced before delivery with futures or forward contracts
- How to decide if to price early?

Price Objectives

- Express cost and profit in $/cwt terms
  - Same units as price
- Start with cost of production
  - Variable cost
  - Total costs
- Set multiple objectives
  - Return over variable cost
  - Return over total cost
  - Desired profit margin

Cost of Production

- Raised livestock
  - Farrow to finish, Cowherd to finish
  - Accumulate cost from birth through finish
  - Relatively stable cost over time
  - Impacted by input prices and production
    » Feed is typically 60-70% of cost
    » Low productivity increases the cost of those that make it to finish because the fixed costs are divided by a smaller number.
Cost of Production

- Purchased feeder livestock
  - Derived demand for feeder animal
  - Highly variable price
  - Depends upon
    » Expected selling price for finished animal
    » Feed costs

Objective Based Pricing Strategy

<table>
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<tr>
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<th>Cost/hd</th>
<th>$/cwt</th>
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<tbody>
<tr>
<td>Feeder &amp; Financing</td>
<td>729.24</td>
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<td>+ Feed Costs</td>
<td>186.71</td>
<td>76.33</td>
</tr>
<tr>
<td>+ Operating Costs</td>
<td>30.46</td>
<td>78.87</td>
</tr>
<tr>
<td>+ Labor Costs</td>
<td>36.55</td>
<td>81.91</td>
</tr>
<tr>
<td>+ Fixed Costs</td>
<td>24.63</td>
<td>83.96</td>
</tr>
<tr>
<td>+ Desired Return</td>
<td>25.00</td>
<td>86.05</td>
</tr>
</tbody>
</table>

550# steer calf fed to 1200 slaughter weight

Objective Based Pricing

- Compare price objectives to price offered
  - Basis adjusted futures
  - Basis adjusted options floor price
  - Forward contract price from packer
  - Price forecast of cash prices
How much to pay for feeder animal

- Work back from total revenue

<table>
<thead>
<tr>
<th>Cost/hd</th>
<th>$/cwt</th>
</tr>
</thead>
</table>

550# steer calf fed to 1200 slaughter weight

Breakeven Purchase Price for 550# Steers

<table>
<thead>
<tr>
<th>FOG</th>
<th>Fed Cattle Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$81</td>
</tr>
<tr>
<td>24.72</td>
<td>119</td>
</tr>
<tr>
<td>26.72</td>
<td>117</td>
</tr>
<tr>
<td>28.72</td>
<td>114</td>
</tr>
<tr>
<td>30.72</td>
<td>112</td>
</tr>
<tr>
<td>32.72</td>
<td>110</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Corn</th>
<th>WDGS</th>
<th>hay</th>
<th>int</th>
<th>yard</th>
<th>other</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1.75</td>
<td>$32.00</td>
<td>$50</td>
<td>7%</td>
<td>$0.30</td>
<td>$30</td>
</tr>
</tbody>
</table>

Livestock Marketing Summary

- When to sell decisions
  - Non-storable
  - Increasing cost from waiting
  - Seasonal and cyclical price patterns
- What to sell
  - Live, carcass, or grid
  - Grid premiums and discounts
- Cost of production
  - Margin cost – marginal revenue
  - Cost of feeder animal