Grazing Management - Improving Profitability

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What does the average cow-calf producer make per cow? Most are surprised that the long-term average return per cow is actually negative. In the study it shows it’s actually -$10/cow. But what does average really mean? Then I describe it as if I put one hand in the freezer and the other hand in the oven, then on “average” I’m pretty comfortable. The “average” return tells me almost nothing.
Here's a report of SPA (Standardized Performance Analysis) records of beef producers in Iowa. It shows that the average producer is losing $10/cow. But the top 25% of producers were making $128 and the bottom 25% were losing $145/cow. That's not the top producer and bottom producer, but the top 25% and bottom 25%. Look at the cost per cow or cost per cwt., the top 25% are going to be profitable as long as calf prices stay above $47/cwt. as compared to $108/cwt. for the bottom 25%. Admittedly our cost of production are a lot higher now, but look at the difference between top and bottom.
So there’s a difference between top and bottom – It’s not just average
• IA & IL study to determine what separated them
  • 4 yrs.: 1996-1999
  • Herd size: 20 to 373 cows

So we’re starting to see that “average” really doesn’t tell us much. So Iowa and Illinois decided to put their SPA records together and see if they could determine what was making some operations profitable while others weren’t. When SPA records were combined the herds ranged from 20 to 373 cows per operation.
The SPA records included all of the standard cost & production variables. They even included items such as unpaid family labor. So which variables do you think stood out as the ones that separated the high profitable from the low profitable operations? There again, I make the participants tell me what they think. If you would like to see the full report you can find it at:
http://www.extension.iastate.edu/Pages/ansci/beefreports/asl1750.pdf
What they found was that over 50% of the variation in profits was a direct result of a variation in feed costs. This doesn't mean that feed costs were 50% of the total budget, (this gets a little tricky to explain) but it means that when trying to predict whether or not a producer would be profitable, they only had to look at feed costs to explain over 50% of that predictability. The second largest variable was depreciation. Calf weight was only 2.4% and calf price was 3.2%. Does that mean that these variables are not important? NO. But it means is that you can only change calf weight and calf price so much. Alternatively if you remember from the first study that some producers were paying twice as much to feed a cow through the year. Look at herd size, it was less than 2% and remember the herds ranged from 20 to 373 cows. So herd size wasn’t a good predictor of profitability either. There were large herds that did a good job managing their feed costs and there were small herds that were doing a good job. So why do we focus all our efforts all EPD’s or trying to figure out how to get 10 cents more per cwt. for our calves. Ron Plain once said that of all the marketing options such as hedging, puts, calls, etc. available, if a producer would just cut 50 cents/cwt. off their costs of production it would make them more money than any of these other marketing options.
Our livestock industry is changing as the price of land and fossil fuels increase. We can't survive if we are still dependent on cheap fuel.
I don’t know what this guy makes, but it’s not enough. But this represents the livestock industry, feed costs is a big bolder hanging over our heads about the fall and crush our industry unless we find adjust our production system.
Feed Costs

• Growing Season
  – (Spring, Summer, Fall)

• Dormant Period
  – (Winter)
Growing Season

• What Drives the Costs?
  – Land, Feed, Fuel, & Fertilizer
  – Utilization
Grazing Efficiency  
(How much forage gets in the cows belly)

<table>
<thead>
<tr>
<th># Pastures</th>
<th>Grazing Period</th>
<th>Utilization Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 pasture</td>
<td>Continuous</td>
<td>30%</td>
</tr>
<tr>
<td>4 pasture</td>
<td>7-10 days</td>
<td>35%</td>
</tr>
<tr>
<td>8 pasture</td>
<td>3-5 days</td>
<td>50%</td>
</tr>
<tr>
<td>12 pasture</td>
<td>2-4 days</td>
<td>65%</td>
</tr>
<tr>
<td>24 pasture</td>
<td>1-2 days</td>
<td>70% + %</td>
</tr>
</tbody>
</table>

These slides of increased utilization, how long is it going to take to repay the fencing and water if you are doubling the amount of forage that is actually going through the belly of the animal?
Where is Your Forage Going?

- 35% - Where’s the other 35%?
- How did it help the cow?
Utilization

- Improving the use of your forage
- Quit wasting grass
- Components needed:
  - Water
  - Fence
Neighbor’s Ranch

• Would you take it?
• But you are required to check the fences every day?
• Anybody want a free ranch?
<table>
<thead>
<tr>
<th>Utilization</th>
<th>0.3</th>
<th>0.35</th>
<th>0.4</th>
<th>0.45</th>
<th>0.5</th>
<th>0.55</th>
<th>0.6</th>
<th>0.65</th>
<th>0.7</th>
<th>0.75</th>
<th>0.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acres Needed</td>
<td>5.18</td>
<td>4.44</td>
<td>3.88</td>
<td>3.45</td>
<td>3.11</td>
<td>2.83</td>
<td>2.59</td>
<td>2.39</td>
<td>2.22</td>
<td>2.07</td>
<td>1.94</td>
</tr>
<tr>
<td>Rent $30</td>
<td>155.39</td>
<td>133.19</td>
<td>116.54</td>
<td>103.59</td>
<td>93.23</td>
<td>84.76</td>
<td>77.69</td>
<td>71.72</td>
<td>66.59</td>
<td>62.15</td>
<td>58.27</td>
</tr>
<tr>
<td>Rent $35</td>
<td>181.28</td>
<td>155.39</td>
<td>135.96</td>
<td>120.86</td>
<td>108.77</td>
<td>98.88</td>
<td>90.64</td>
<td>83.67</td>
<td>77.69</td>
<td>72.51</td>
<td>67.98</td>
</tr>
<tr>
<td>Rent $40</td>
<td>207.18</td>
<td>177.58</td>
<td>155.39</td>
<td>138.12</td>
<td>124.31</td>
<td>113.01</td>
<td>103.59</td>
<td>95.62</td>
<td>88.79</td>
<td>82.87</td>
<td>77.69</td>
</tr>
<tr>
<td>Rent $45</td>
<td>233.08</td>
<td>199.78</td>
<td>174.81</td>
<td>155.39</td>
<td>139.85</td>
<td>127.13</td>
<td>116.54</td>
<td>107.58</td>
<td>99.89</td>
<td>93.23</td>
<td>87.41</td>
</tr>
<tr>
<td>Rent $50</td>
<td>258.98</td>
<td>221.98</td>
<td>194.23</td>
<td>172.65</td>
<td>155.39</td>
<td>141.26</td>
<td>129.49</td>
<td>119.53</td>
<td>110.99</td>
<td>103.59</td>
<td>97.12</td>
</tr>
</tbody>
</table>
Winter – Dormant Period

- What Drives the Costs?
  - Feed & Hay
  - Days Grazing
Reducing Winter Feed Costs

- Hay is expensive costing $1-1.50 hd/day
  1. Equipment cost
  2. Transportation cost
  3. Storage cost (Horner, 2005)

- Stockpiled tall fescue is inexpensive
  Costing $0.45 hd/day
  1. Extends the grazing season (Fribourg and Bell, 1984)
  2. Reduces winter labor cost (Van Keuren, 1970)
  3. Almost eliminates the need for hay (Clark, 2003)

However, tall fescue is commonly infected with a fungal endophyte, known to caused animal health disorders

Cheapest way to reduce costs, extend the grazing season with stockpiled fescue.
Tall Fescue in Autumn

- Almost entirely leaf
- Grows rapidly from early September until November – 1 to 2 tons per acre with good management
- More fall growth than other CSG’s
- Waxy layer on leaves slows deterioration
You can practically double the amount of usable forage you get simply by stripgrazing in the fall. If your neighbor offered you the use of his farm for free with the only requirement that you had to go check your cows 20 minutes a day, would you do it? Of course you would. Stripgrazing can essentially get you a free farm for a very minimal investment.
Figure 1. Comparison of stockpiled tall fescue quality to average hay quality.

Nutrient comparison of stockpiled fescue to typical hay.
Cow, sheep, goat, or horse can all harvest forages cheaper than you can!

Why do animals have 4 legs? Because they were meant to balance while they walk and eat. Every day they are standing and you are hauling their forage to them, whether it be a bag of grain or a bale of hay, is a day you are losing money.

No matter what you produce, cattle, sheep, goats, or horses, they can always harvest the forages cheaper than you can with equipment.
Consider the costs associated with pasture production. Usually the largest single cost is the land itself, whether renting, paying principle and interest, or figuring an opportunity cost. Besides land cost, we have pasture establishment; annual maintenance such as fertilizer and clipping; fence and water developments; and taxes. Let’s assign an index value of 100 to the cost of providing a unit of energy from pasture.
Relative Cost of Supplying a Unit of Energy to Ruminants (cont.)

- Pasture 100
- Alfalfa hay 192
- All types of hay 222

The comparison shown is actually 1981 data. Consider how much the price of equipment, repairs, and labor has increased since 1981. Many comparisons based on today’s costs show hay being three times more expensive than pasture. There is no reason to believe that the cost of harvested forage will get any lower. With each passing year, the importance of extending the grazing season increases.
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Another review slide, what does it take to produce grass? Why is there a $100 bill sticking in the manure pile, because it has value. What I’m about to tell you may sound stupid but it’s going to help you remember it. When you go out to your field tomorrow and you see your cow, or horse, or goat lift it’s tail and start defecating, I want you to remember the old time cash register going “cha-ching.” Old Bessie there just reduced your fertilizer bill for next year. Some producers have asked to buy my cow that producers that $100 bill, everyone of you have that cow. Actually the manure value of each of your cows is much more than that.
### Fertility Removed by Haying vs. Grazing

<table>
<thead>
<tr>
<th>Nutrient Removal (lbs./acre)</th>
<th>2 Tons of Hay</th>
<th>Cow/Calf Pairs or Stockers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>100 N</td>
<td>10 N</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>30 lb. P$_2$O$_5$</td>
<td>7 lb. P$_2$O$_5$</td>
</tr>
<tr>
<td>Potassium</td>
<td>80 lb. K$_2$O</td>
<td>1 lb. K$_2$O</td>
</tr>
</tbody>
</table>

Source: Dr. John A. Lory, Environmental Nutrient Management Specialist, University of Missouri
Nutrients in Hay

1000 lb. bale of grass hay

- 25 lb. of N
- 7.5 lb. P₂O₅
- 20 lb. K₂O
What’s It Worth?

1000 lb. bale of grass hay

- 25 lb. of N (30%)
- 7.5 lb. P₂O₅ (100%)
- 20 lb. K₂O (100%)

- N - $5.32
- P₂O₅ - $4.12
- K₂O - $11.00

Total = $20.44

N =$0.71, P =$0.55, K = $0.55
Nutrient Management is More than Just Hay

One paddock of 3–pasture rotation

- 10 - 20
- 20 - 30
- 30 - 40
- > 40

Piles per 500 ft²

Feet south from water

Feet east from water

One paddock of 24–pasture rotation

- 30 - 40
- 40 - 50
- 50 - 60
- 60 - 70
- > 70

Piles per 500 ft²

Feet south from water

Feet west from water
If you get a manure pile every square yard in 2 years what is that going to do to your fertilizer bill? This will pay for itself in a hurry.
Cows will intensively graze by nature, only you can intensively manage. Cows don’t worry about making the farm payment or sending the kids to college. If you let cows make important business decisions, you will have a business that meets the cows objectives, not yours. Management is what we are trying to intensify, not just grazing.
Why Management-intensive Grazing?

We place emphasis on the word “MANAGEMENT” when we speak of Management-intensive Grazing (MiG) to make it clear that it is the management aspect of the system that is being intensified, not simply the grazing.

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What is Management-intensive Grazing?

• A goal driven approach to managing grassland resources for long term sustainability

In order to manage effectively, we need to have goals. Those goals should be recorded, attainable, and measurable.
What is Management-intensive Grazing? (cont.)

- A goal driven approach to managing grassland resources
  - Lifestyle
  - Financial
  - Resource condition
  - Production strategies

We like to think about goals as being multiple objective or dealing with more than just one facet of the business.
Begin by thinking how you want to live. Where do you want to live? What sort of creature comforts do you and your family require? How many hours a week do you want to work? Do you want to be able to leave the operation for a week or two of vacation? These considerations go into developing a lifestyle goal.

After you decide how you want to live, the next question is how much money do you need to live that lifestyle? What does the net farm income need to be? Is it achievable with the resources available to you?

The next goal deals with managing your resources. What kind of condition are they in now and what do you want them to be like in 5, 10, 20, or 50 years? A very simple resource goal is the statement, “I want this farm to be in better condition for my kids than when I got it.”

Finally, when all other goals are set, it is time to determine what production system will best let you achieve those goals. Don’t get caught in the trap of keeping the same production system that has always been on the ranch and hope that it will allow you to achieve your goals. Sometimes it will, sometimes it won’t.
Let’s look at the goals of grazing management. Our first goal is to meet the nutritive needs of livestock from standing pasture as many days of the year as possible. Standing pasture is almost always the cheapest source of both protein and energy for ruminant livestock.
We want to try to optimize pasture yield, quality, and persistence. Rarely do we ever try to maximize pasture yield. Why not? Because you probably can’t afford it. We usually don’t try to maximize pasture quality. Why not? Because most classes of livestock do not need the maximum quality that pasture can provide. Excessively high pasture quality can actually be a detriment to animal performance.
We are always trying to balance forage pasture and quality. This figure shows the compromise between yield and quality that takes place with every pasture growth cycle. As pastures are allowed to grow during a rest period, yield increases, but quality declines. The optimum balance depends on type of livestock and physiological stage of production. This is why it is impossible to say that a rest period should always be so many days or that a pasture should always be so many inches tall before
grazing begins. Knowing how to balance yield and quality for the livestock requirements is a critical skill in MiG.
HOW GRASSES GROW

• 95% of plant food is taken from the Air
  Leaves are Food Factories

• 5% of plant food is taken from the soil
  Roots gather raw materials (water, nitrates, minerals) which are converted into plant food by the leaves

• OVERGRAZING WILL DESTROY BOTH THE LEAVES AND THE ROOTS!
The basic process of photosynthesis is what takes solar energy and makes cattle feed. Only green, growing leaves carry out photosynthesis. Bare soil doesn't do it. Dead, brown plants don't do it. Thus, one of the first objectives of grazing management should be to grow more leaves on more acres as many days of the year as possible. Think of the pasture as a big solar panel and try to make the solar panel as efficient as possible.
The Root System is Almost a Mirror Image of the Top Growth

Short, weak plants = short, weak roots
Removing leaves also affects the plant below ground. If too many leaves are removed, all the stored energy goes to making new leaves; the roots do not grow. As a rule, "taking half and leaving half" allows some leaves to be removed while not slowing down root growth.
A third objective is to maintain or enhance the natural resource base of the farm or ranch.
Our objectives should call for healthy, productive soils with increasing levels of soil organic matter. A water cycle that features a high degree of infiltration and minimal runoff even in intense precipitation events. A stable, well adapted plant community will help both soil health and the water cycle, as well as supplying balanced nutrition to grazing animals. Quality wildlife habitat which allows a diversity of animal species to coexist with our livestock is also desirable.
Infiltration and Runoff

3 inches of rainfall in 90 minutes, 10% slope, silt loam soil

(University of Nebraska & USDA-SCS, 1937)

Excellent pasture | 95% ground cover
Fair pasture      | 75% ground cover
Poor pasture      | 50% ground cover

Soil loss (tons/A)  Percent runoff
The basic process of photosynthesis is what takes solar energy and makes cattle feed. Only green, growing leaves carry out photosynthesis. Bare soil doesn’t do it. Dead, brown plants don’t do it. Thus, one of the first objectives of grazing management should be to grow more leaves on more acres as many days of the year as possible. Think of the pasture as a big solar panel and try to make the solar panel as efficient as possible.
One of the tools we use to grow more leaves is choosing the proper stocking rate. If three cows are waiting for every blade of grass as it comes up, the solar panel will never develop. On the other hand, if grazing pressure is too light and the plants grow up and are left ungrazed, dead material accumulates and the solar panel loses efficiency. As with most things in life, balance is the key.
Plant species diversity is another tool we use for growing more leaves. A pasture with a single species growing in it has a very limited window of use. As more species occur in the pasture, the more likely we are to have something with green growing leaves on more days of the year. Mixtures of coo-season and warm-season species provide more days of active photosynthesis than either type alone. Layering of vertical grass leaves and horizontal legume leaves creates a more efficient solar panel.
Annuals in a pasture can extend the grazing season beyond what just the perennials provide.
Basic Ingredients for Making Beef (cont.)

1. Solar energy
   • Only green, growing leaves capture solar energy, and make cattle feed.
   • Grow more leaves through:
     1. Proper stocking rate
     2. Species diversity
     3. Rest period

The main purpose of a rest period in pasture management is to allow the plants to grow more leaves. More leaves provide more energy for root growth and carbohydrate storage and plant vigor is maintained. Rest periods should be of appropriate length to create an efficient solar panel but shorter enough to prevent the plants from becoming decadent.
Plant Growth and Management: Plant Persistence

**During grazing periods:** control stubble height
- not too low — keep growing points
- not too low — good photosynthesis
- not too low — keep roots growing

**Between grazing periods:** schedule rest periods
- allow photosynthesis
- allow leaves to regrow
- allow “vegetative reproduction” (spreading plants)

The 3-day grazing period, as well as the 33-day rest period will affect individual plants. If paddocks are grazed at the proper height, plants will retain some growing points, chloroplasts, and roots. This will help the plants recover during the rest period. During a long rest (assuming grazing has not been too severe), new tillers will emerge, leaves will make and store carbohydrates, and roots will keep growing.
Grazing Period Needs

Goal:
- Grass plant begins regrowth in 5 to 7 days.
- Do not graze the regrowth in the same grazing period

- Plant based:
  - 2 - 5 days fast grow
  - 5 - 9 days moderate
  - 9 - 12 days slow growth

- Animal performance:
  - 0.5 - 1 day dairy cows
  - 1 - 2 days growing/fattening
  - 2 - 4 days lactating beef cattle, sheep, goats, horses
  - 4 - 7 days dry animals
Rest Period needs

- Rest period needs:
  - 15 - 20 days during rapid growth
  - 20 - 30 days during moderate growth
  - 30 - 40 days during slow growth
  - 40 - 60 days very slow growth
Here is a system that is grazed seven times. Note several things:

First, note the spring cycles are brief. Because the grass is growing rapidly, cattle cycle through the paddocks rapidly. This prevents the grass from “getting away” from the producer. Second, note the principle discussed on the previous slide--with each cycle, the cattle graze a different mix.

In early spring, cattle may begin the grazing season by consuming tall fescue and red clover. Because the forage is growing and maturing quickly at this time of year, cattle may move through the paddocks in 12 days. Each time they return to a paddock, they are presented with a different fescue:clover ratio. They consume forage present, in so doing, they “level the playing field.” Plants that may have been “shaded out” will begin to grow.

By late spring, cattle are also presented with a different set of forages species; legumes such as birdsfoot trefoil have greened up. By early summer, cattle will be grazing more legume and less cool-season grass.

The important thing to note, a system like this has potential to provide leafy forage throughout most of the growing season. And even after the October killing frost, cattle have leafy stockpiled grass to consume.
Good pasture management is based on the simple principles of plant growth covered earlier. To illustrate, we will consider management of a 12-paddock system; this system will have 3 days of grazing on each paddock, so it will provide 33 days rest for each paddock.

The livestock rotation in this example will show how appropriate leaf removal and rest periods will help plants and pastures thrive.
How many paddocks are needed to provide adequate rest for a pasture? This figure shows the percent of time a pasture is resting relative to the number of paddocks within the pasture. Note that just four paddocks provide 75% rest opportunity and eight paddocks provide 87% rest. Most of the rest benefit of rotational grazing is achieved with just four to eight paddocks. This is enough to keep pastures more vigorous.
Basic Ingredients for Making Beef (cont.)

1. Solar energy
2. Water
   - Water for the pasture
   - Water for the livestock
Basic Ingredients for Making Beef (cont.)

1. Solar energy
2. Water
3. Soil nutrients

Something bought in town?
Basic Ingredients for Making Beef (cont.)

1. Solar energy
2. Water
3. Soil nutrients

Something bought in town, or an on-farm resource?
Basic Ingredients for Making Beef (cont.)

1. Solar energy
2. Water
3. Soil nutrients
4. One harvester (grazing animal)
Grazing Management Objectives

• Have grazing animals take 1 large bite or mouthful (intake – bite size) off of as many plants as possible in a pasture (utilization)
• Remove the animals from the pasture before any regrowth occurs and by the time 50% of the current growth has been removed (plant persistence/health)
• Have enough pastures to allow sufficient regrowth and rest before being grazed again (rest/plant health) (intake)

Mark Kennedy, Ozarkian, 2007
"The more metal and fuel you put between solar energy and a cow's belly the less profitable you will be."

Jim Gerrish

Quote by Jim Gerrish that I love.
Summary

• Management-intensive Grazing:
  – A method of utilizing the forage resource to maximize return, while maintaining the productivity of the resource base for the long term
  – Aims at managing the soil, water, plants and animals together as a whole in a systems approach
  – You, the manager, are in control of time and space
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