

Raising Dairy Replacement Heifers on Pasture and Soil Health



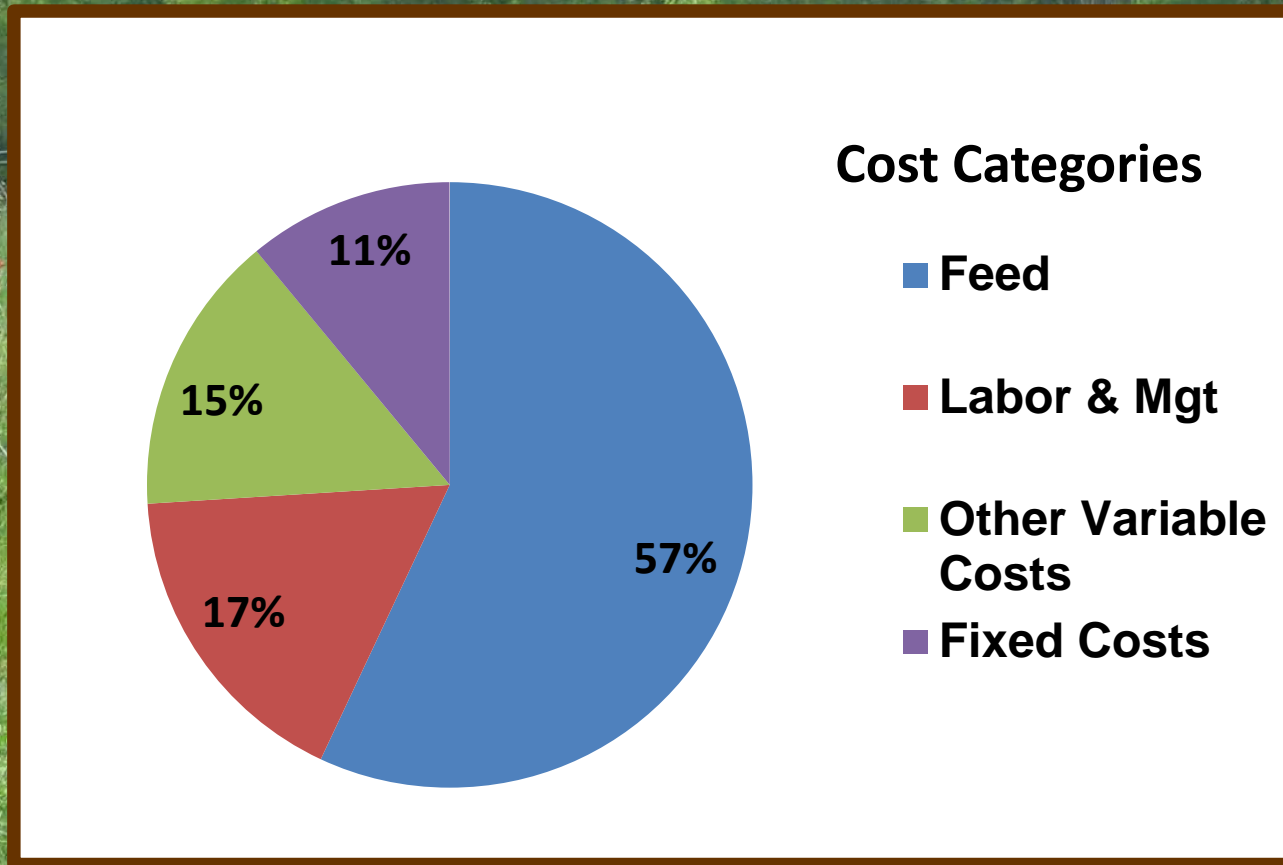
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Cost to Raise a Heifer from Birth to Freshening

	2007	2013
Feed	\$683	\$1,274
Bedding	49	112
Veterinary	33	63
Breeding	49	48
Electric & fuel	34	39
Interest	67	69
Death loss	3	7
Labor (paid & unpaid)	255	372
Management (paid & unpaid)	38	32
Allocated cost (variable + fixed) + labor + mgt	\$1,323	\$2,274

Vanderwerf et al., 2013 UW Extension survey of 32 WI dairy farms & custom heifer growers (no pasture-based farms)

Dairy Heifer Raising Expenses are the Second Highest Expense on Most Farms



Heifer Development Goals

Breed	Birth Weight, lbs	Average Daily Gain, lbs/day	55% Mature Weight, lbs	82% Mature Weight, lbs	Mature Body Weight, lbs
Holstein, Brown Swiss	100	1.7	750 – 850	1200 – 1300	1500
Guernsey, Ayrshire	75	1.4	600 – 700	900 – 1000	1250
Jersey	65	1.3	550 – 600	850 – 950	1100

Kilmer and Tranel. Optimizing Your Heifer Enterprise. Iowa State University.

Comparison of Three Replacement Heifer Feeding Strategies

- Year-round custom confinement (365 days)
- Year-round on-site confinement (365 days)
- Grazing (180 days: May – October) + on-site confinement (185 days: November – April)

Comparison of Three Replacement Heifer Feeding Strategies

Year-round custom confinement:

- \$2.00 - \$2.50/hd/d*
- \$730 - \$913/hd/yr

Year-round on-site confinement:

- \$1.50 - \$2.00/hd/d*
- \$548 - \$730/hd/yr

*Data from Brown County, WI dairy farmers

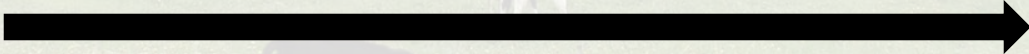
Comparison of Three Replacement Heifer Feeding Strategies

Grazing + on-site confinement:

- Grazing: \$0.43/hd/d*
- \$77/hd for 180 days
- On-site confinement: \$1.50 - \$2/hd/d
- \$278 - \$370/hd for 185 days
- Combined cost
 - \$355/hd/yr (\$1.50 on-site confinement cost)
 - \$447/hd/yr (\$2 on-site confinement cost)

*Data from Hans Breitenmoser records. Reviewed by Farm Credit Services for validation.

What is the Cost Savings for 100 Head per Year?

Year-round custom confinement (\$2/hd/d):	\$73,000
<u>Grazing + on-site confinement (\$1.50/hd/d):</u>	<u>\$35,500</u>
Savings from replacing custom confinement with grazing 	\$37,500

51% Cost Reduction

What is the Cost Savings for 100 Head per Year?

Year-round on-site confinement (\$1.50/hd/d): \$54,800

Grazing + on-site confinement (\$1.50/hd/d): \$35,500

Savings from replacing custom confinement with
grazing 

\$19,300

35% Cost Reduction

Research Study: Heifers Raised on Pasture versus Confinement

- Wisconsin Integrated Cropping Systems Trial at UW-Madison Arlington Research Station (2000 – 2009)
- CIAS Research Brief #89: <http://www.cias.wisc.edu/wp-content/uploads/2013/01/rb89final-2.pdf>
- Data Collected: Average Daily Gain, milk production (1st lactation), health issues, age at first calving
- Heifers: 500 lbs/hd, 6 – 10 months old, mostly Holsteins

Research Study: Heifers Raised on Pasture versus Confinement

Grazing Group:

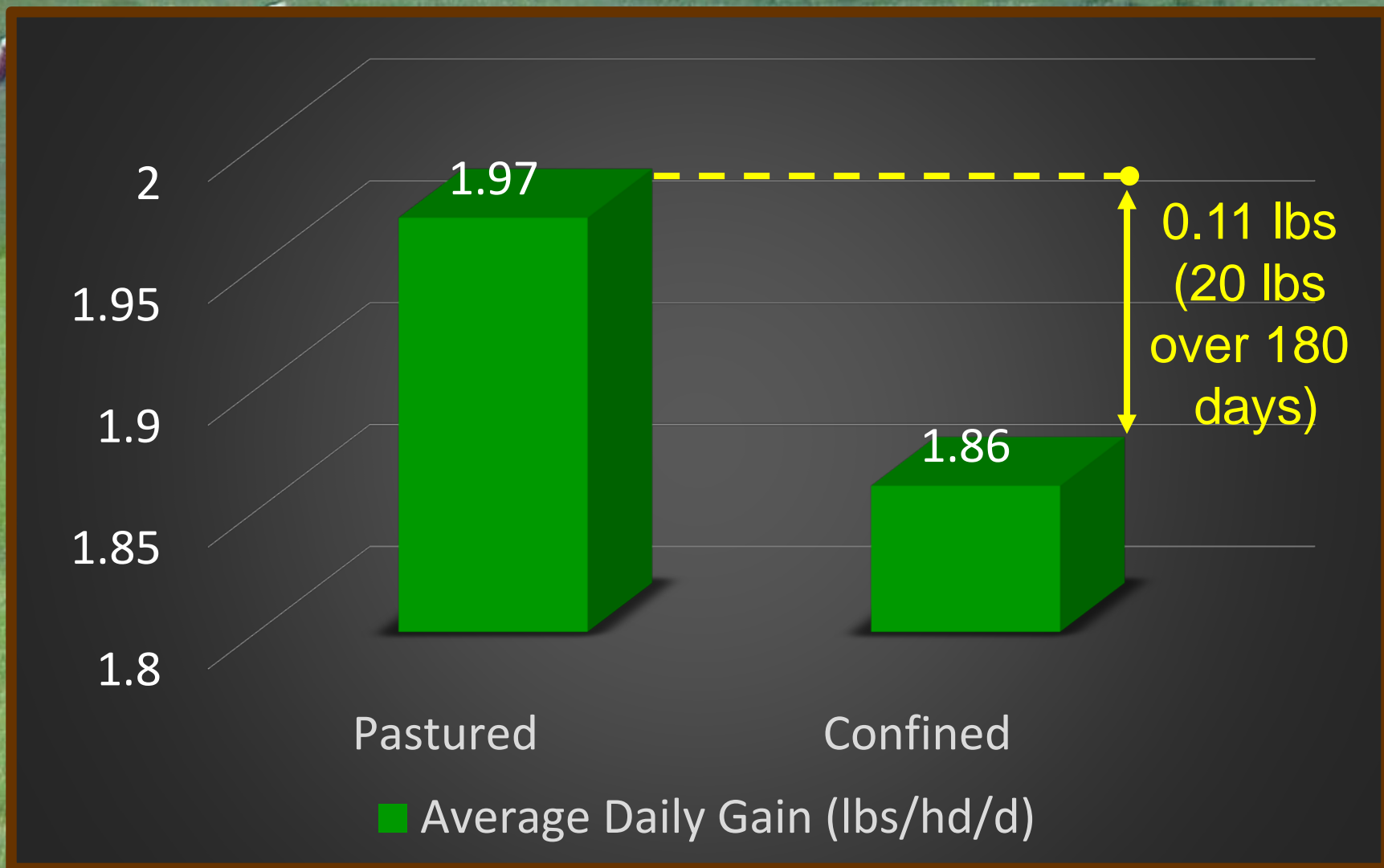
- Pastured May – October
- 4 – 6 hd on 4, 0.7-acre subdivided pastures
- Red clover, Smooth brome, Timothy, Orchardgrass
- Excess pasture growth cut for hay
- Supplemented with hay to maintain adequate pasture regrowth
- Recovery period: 25 – 35 days
- Grain: 2.5 lbs/hd/d

Confinement Group: TMR → 11 lbs alfalfa haylage, 5 lbs corn silage, 5 lbs (corn, soybean meal, oats, molasses)

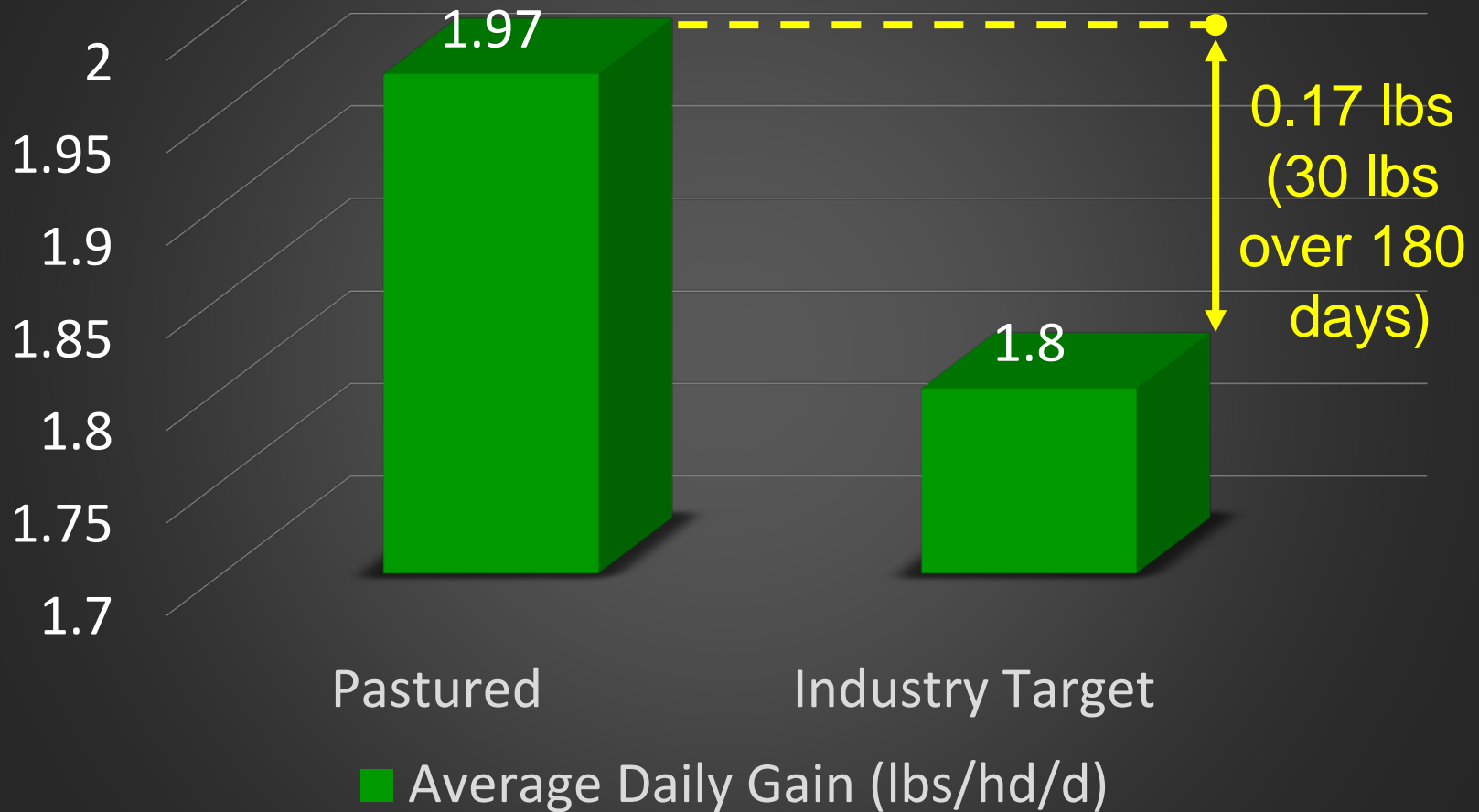
Research Study: Heifers Raised on Pasture versus Confinement

- ADG: 54 heifers on pasture, 61 confined
- First lactation performance: 37 heifers on pasture, 48 confined

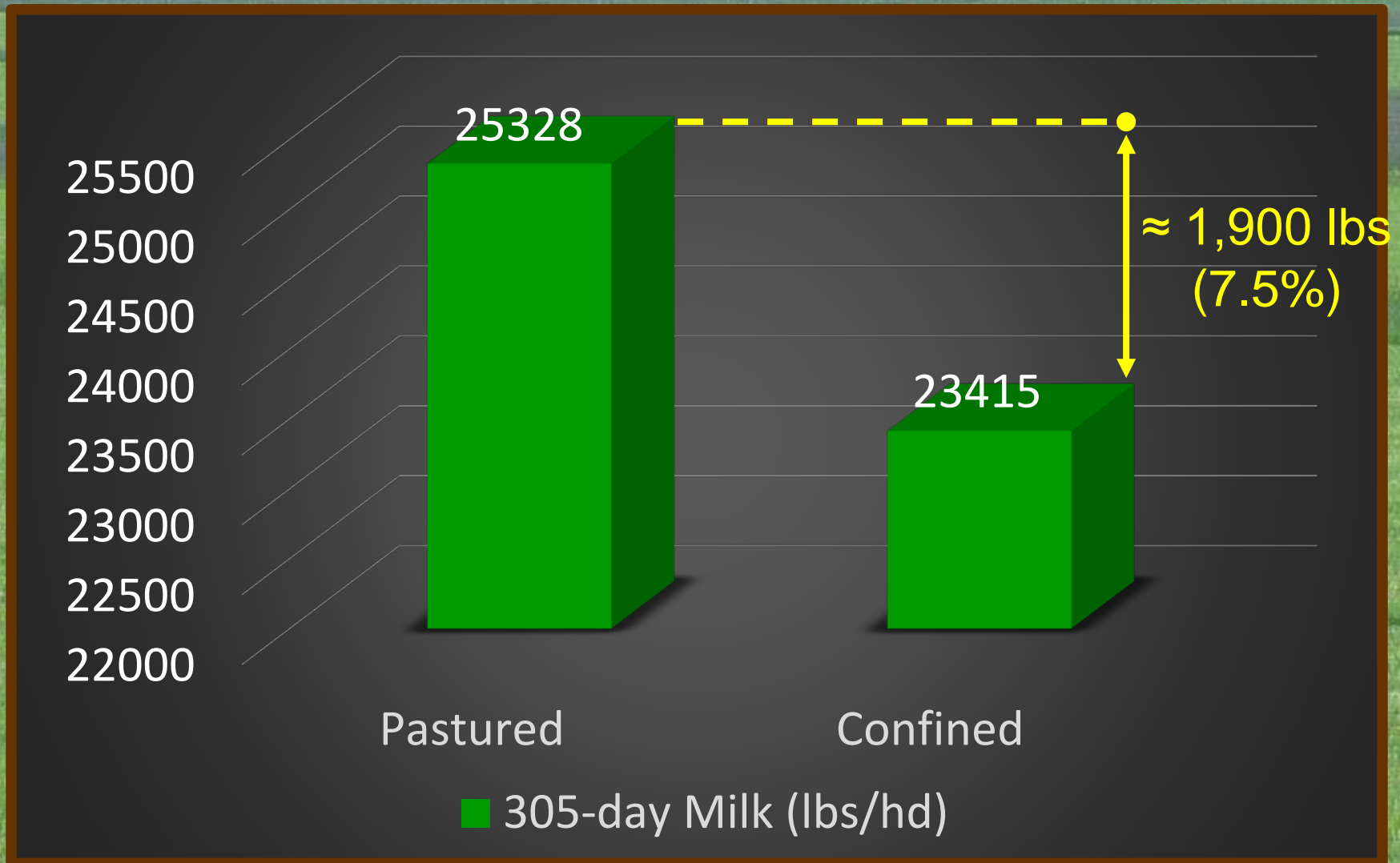
Heifer Weight Gain (11 year average)



Heifer Weight Gain (11 year average)



First Lactation Performance (10 year average)





Potential Revenue Increase from First Lactation Performance

- For 100 heifers, 190,000+ lbs more milk if raised on pasture versus confinement
- $190,000 \text{ lbs} \times \$15/\text{cwt} = \$28,500$ (gross)

UW Study Summary

- Pasture-raised heifers can:
 - Exceed target industry standards for ADG
 - Exceed ADG than confined heifers
 - Produce more milk in first lactation
- Stocking rate, pasture management, and amount of grain fed will affect ADG, but can be easily modified depending on goals and resources.
- No significant difference versus confined heifers for:
 - Age at first calving
 - Frequency of displaced abomasums
 - Retained placentas at first calving

Cattle Relative Forage Quality Needs*

Quality Required

Dairy, 1st trimester
Dairy calves

Dairy: last 200 days
Heifers: 3-12 mo.
Stocker cattle

Heifers: 12-18 mo.
Lactating Beef
Cow

Heifer, 18-24 mo.
Dry cows



*Ball et al. 2008. Extending Grazing and Reducing Stored Feed Needs

Local Success Story

Hans Breitenmoser 400 Head Dairy

Merrill, WI




Breitenmoser Farms Heifer Weight Summary

Rate of Gain per day: (actual average daily gains from weighed animals)

<u>28-April-09</u> 2.112	<u>01-July-09</u> 0.849	<u>30-July-09</u> 2.62	<u>04-Sept-09</u> 1.74	<u>01-Oct-09</u> 3.35	<u>31-Oct-09</u> 2.39
<u>02-Dec-09</u> 2.08	<u>30-Jan-10</u> 1.89	<u>03-April-10</u> 1.79	<u>05-May-10</u> 1.51	<u>06-June-10</u> 1.86	<u>05-July-10</u> 2.25





“I am finding after 5 years of managed grazing...I can raise heifers on pasture for about \$0.40 per animal per day and reach all of the Industry standards for weight and height rates of gains. They are strong and in good condition when they come into my freestall. This still saves me about \$40,000 per year over having them custom raised.”

-Hans Breitenmoser, 2013

Corn Grain versus Heifers on Pasture

Corn Grain	
Revenue (160 bu/ac, \$6.00/bu, 71 ac):	\$68,160
Expenses	
Operating:	\$29,820
Fixed (\$225/ac land rent):	\$20,377
Total:	\$50,197
Profit:	\$17,963

Corn Grain versus Heifers on Pasture

Cost per day to have heifers custom raised	2
Number of animals	125
Days of grazing	180
Hours of labor per day	1.25
Labor cost/hr	\$15.00
Land rent per acre	\$225.00
Acres	71
Cost of grazing development per year on 20 yr amortization	20,580 \$1,841.00

Amortization & Maintenance	\$3,379.00
Vet. Services (\$5/animal)	\$625.00
Land rent total	\$15,975.00
Cost of labor during season	\$3,375.00
Total cost for grazing season	\$23,354.00
Cost per day per animal	\$1.0380

Savings per year to graze heifers **\$21,646.00**

University of Minnesota: Laura Torbert 2000 – 2002

Heifers on Pasture versus Confinement: Results at First Calving

- More than 50% reduction in D.A.
- 40% less calving difficulty
- 33% less ketosis

Bottom Line for Heifers on Pasture

- 
- A photograph of a herd of cows grazing in a green pasture, serving as the background for the slide. The cows are of various colors, including black, white, and brown. They are scattered across the field, some standing and some grazing.
- Gain at industry standards
 - Improved first lactation production
 - Greater longevity
 - Higher fertility rates
 - Produced at lower cost than comparable custom raising
 - Clean and well-conditioned animals
 - Greater calmness from daily interaction

Bottom Line for Heifers on Pasture


- Aggressive eaters in pasture and feed bunk
- Improved fitness/athleticism
- Reduced leg and hoof problems
- Reduced D.A. problems
- Reduced calving difficulty
- Reduced milk fever
- Good PR

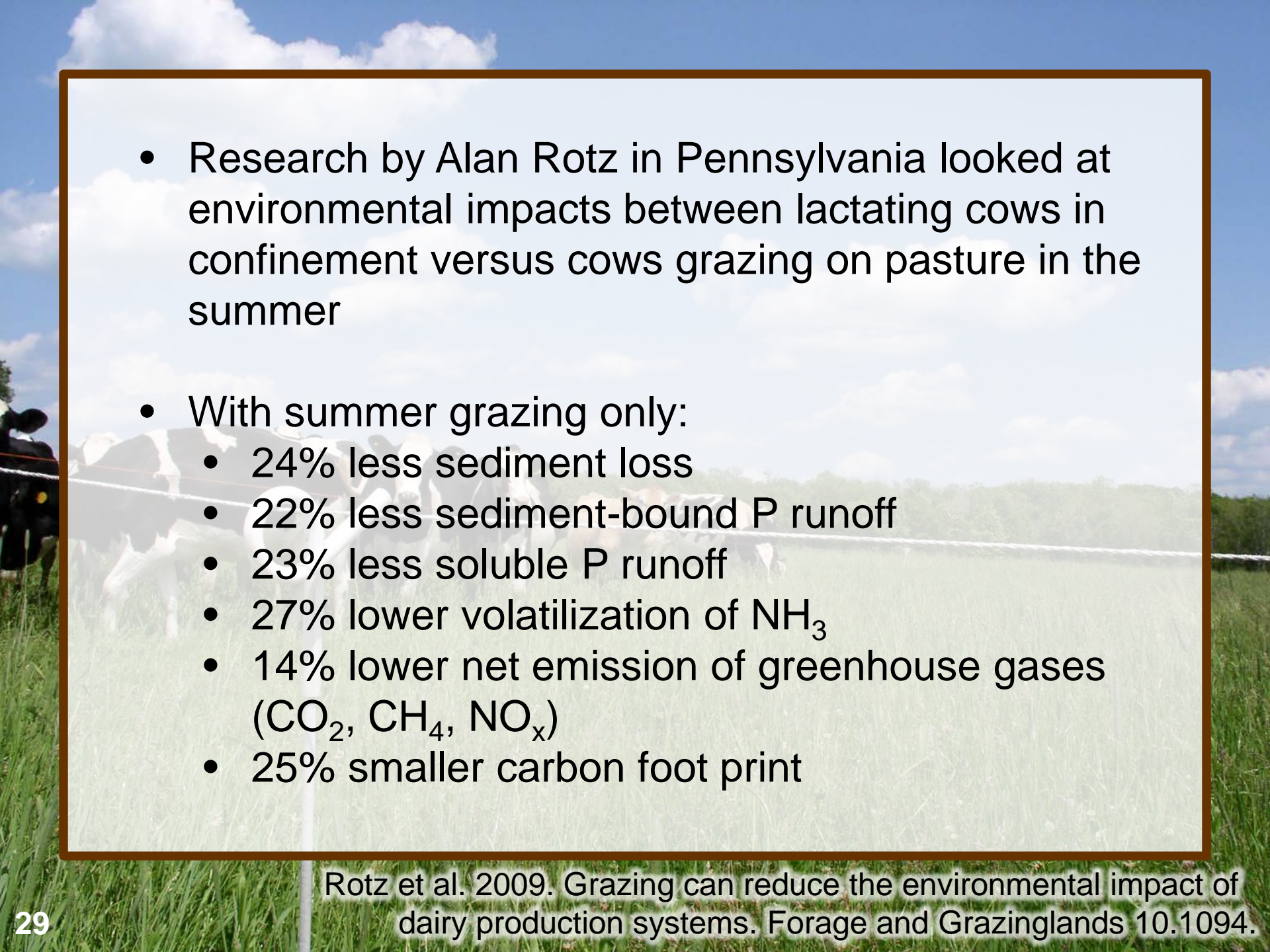
What do we mean when we say Adaptively-Managed Grazing?

Grazing that is both managed and adaptive!

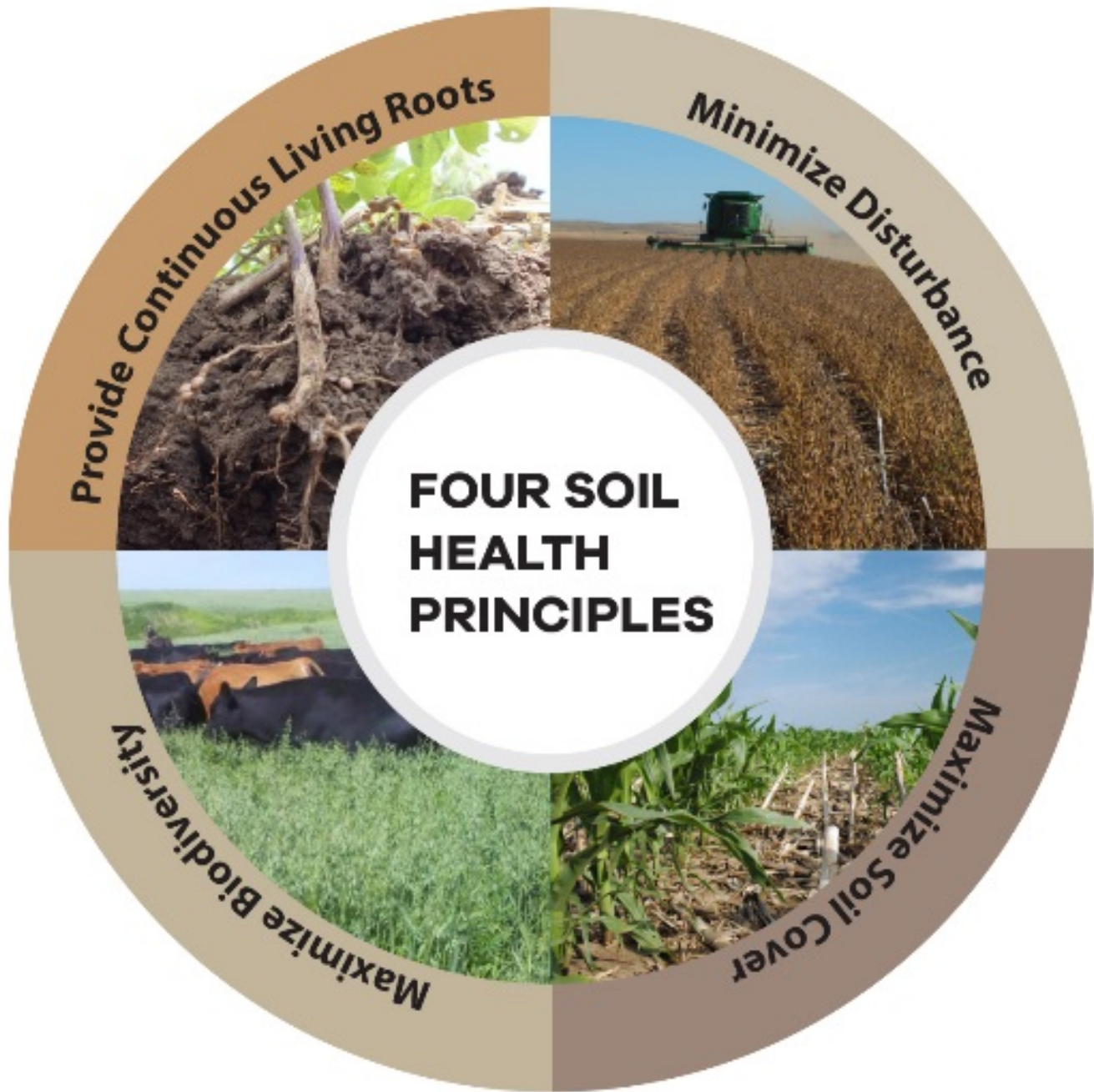
Managed	<ul style="list-style-type: none">• Livestock are strategically placed to improve the health of the entire farm ecosystem• Includes all animals, plants, soil life, and landowner objectives• Continuous grazing <i>is not</i> managed grazing
Adaptive	<ul style="list-style-type: none">• Changing conditions in weather, forage growth rates, livestock numbers, livestock nutrient requirements, and landowner needs• Influences graze period, recovery period, paddock size, and stock density

Why do we as land stewards want Adaptively-Managed Grazing on the land?

- 
- Wisconsin Integrated Cropping System Trial at UW-Madison Arlington Agricultural Research Station (1999 – 2008)
 - Significantly greater earthworm counts: improve infiltration, aeration, nitrogen mineralization
 - Significantly greater percent of water stable aggregates: soil particles bound more tightly to withstand tillage, water, or wind erosion

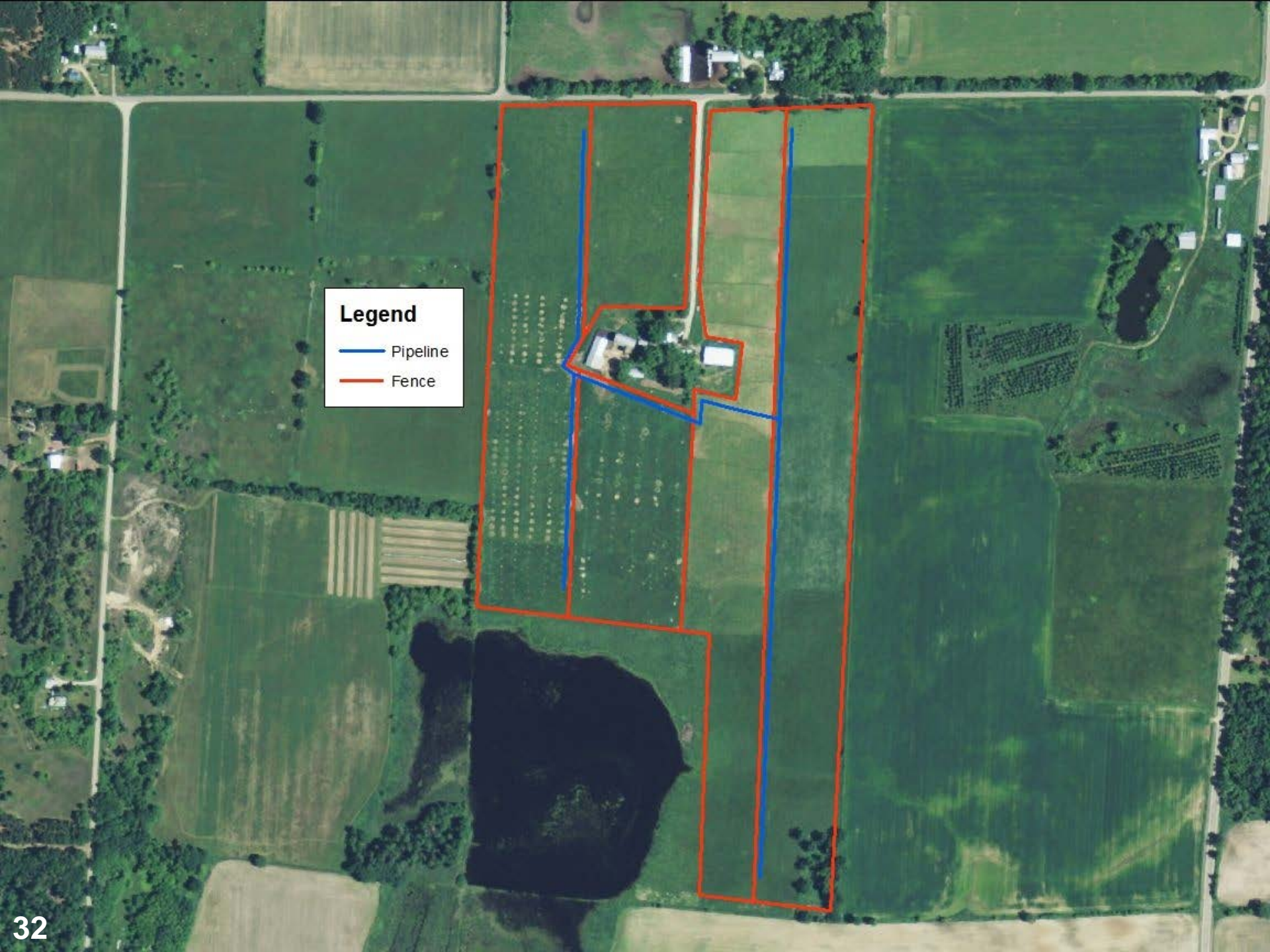
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- Research by Alan Rotz in Pennsylvania looked at environmental impacts between lactating cows in confinement versus cows grazing on pasture in the summer
 - With summer grazing only:
 - 24% less sediment loss
 - 22% less sediment-bound P runoff
 - 23% less soluble P runoff
 - 27% lower volatilization of NH_3
 - 14% lower net emission of greenhouse gases (CO_2 , CH_4 , NO_x)
 - 25% smaller carbon foot print

Rotz et al. 2009. Grazing can reduce the environmental impact of dairy production systems. *Forage and Grazinglands* 10.1094.



How do you set up a successful grazing system?

- Go to pasture walks and ask lots of questions
- Plant recovery of 30+ days to regenerate the shoot and the root
- Graze periods no longer than 3 days
- Sufficient residual heights for faster plant regrowth and keep soil covered
- Convenient and flexible layout
- Adequate water; portable if possible



Legend

- Pipeline
- Fence

Perimeter Fences

- Use high-quality materials, don't go for the cheap stuff
- High-tensile, smooth wire fences, not barbed
- High-quality, low impedance, and sufficiently grounded energizer
- At least three wires

Temporary Fences

- High-quality materials that will handle easier and last longer than the cheap stuff
- Polywire with as many stainless steel conductors in it for greater breaking strength, greater conductivity, and maximum life
- Step-in posts (pigtail, plastic, and coated fiberglass)
- Geared reels with 300 feet of polywire or less
- Have an extra 50 feet of polywire on each reel

Electric Fences are Mental Boundaries that Require Training



Watering Systems

- For new pastures, expect there's going to be damage to the pasture and the new seeding
- Two, smaller tanks per paddock can reduce pasture damage versus one, larger tank
- As the forage sward thickens, pasture damage should decrease
- Place portable waterer in a different location each time

Lanes

- Build them to NRCS standards
- Take water flow into consideration; don't construct where they'll become a dam
- In undulating terrain, make sure lane is at least 18 inches above grade and crowned
- Direct water to ditch or grassed waterway

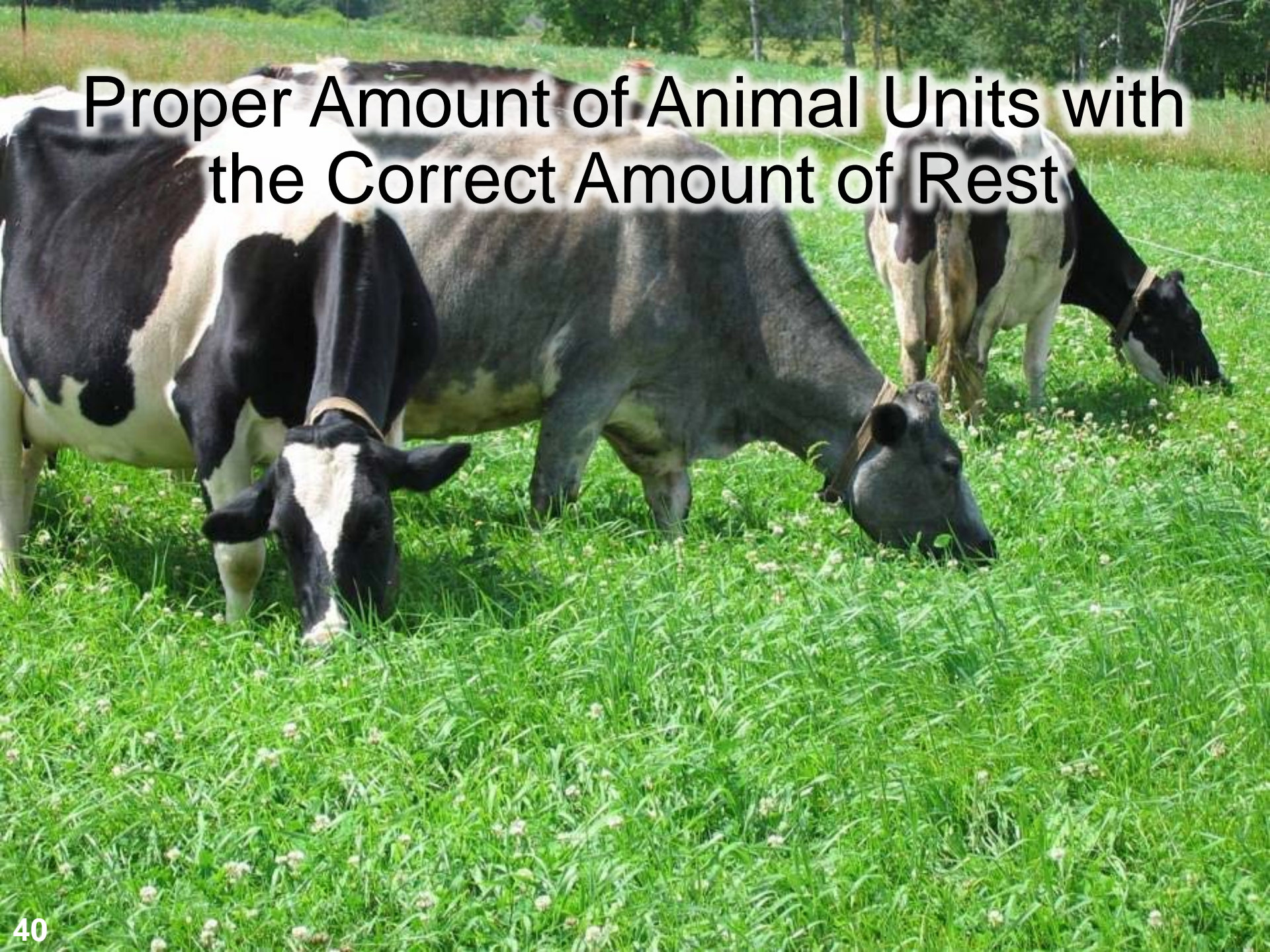
Forages

- Graze what grows
- Follow a good nutrient management plan
- Learn how to graze your forages
- Plant species that are suited to your farm

Too Many Animal Units with too Little Rest



Proper Amount of Animal Units with the Correct Amount of Rest



Basic Operation and Maintenance for Adaptively-Managed Grazing

- Pasture recovery is extremely important
- Do not over graze
- Square paddocks
- Always work on improving fertility

Other Things to Consider

- Feed Budget
- Nutrient Management
- Plan for the Weather
- Animal Feeding Sites
- Harvest Strategies
- Out-wintering
- Heavy Use Area

For More Information

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