

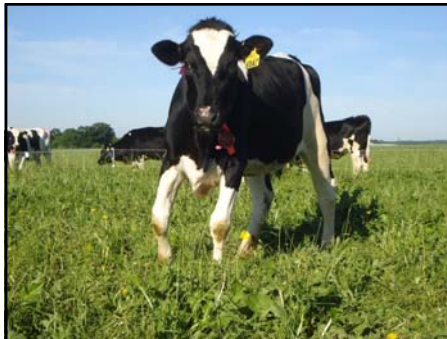
## Benefits of Raising Heifers on Pasture

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Heifers are an investment in the future



- ✓ Need for high quality replacements
- ✓ Second largest expenditure on dairy farms



'Classic Goals' :            Keep heifers alive and healthy  
   Grow fast enough to breed at 13-15 months of age

Combs' revised Goals:    Manage growth to optimize production as lactating cows  
   Control costs of production

## Manage growth to optimize production as lactating cows

- Prewaning feeding programs
  
- Genomic Testing

## First Lactation Milk Yield Response to Intensified Calf Nutrition

| Trial                    | Treatment difference, lbs |
|--------------------------|---------------------------|
| Foldager and Krohn, 1994 | 3092                      |
| Bar-Peled et al., 1998   | 998                       |
| Foldager et al., 1997    | 1143                      |
| Ballard et al., 2005     | 1543                      |
| Shamay et al., 2005      | 2162                      |
| Rincker et al., 2006     | 1100                      |
| Drackley et al., 2007    | 1841                      |
| Morrison et al., 2009    | 0                         |
| Moallem et al., 2010     | 1613                      |

“An analysis of all the lactation data and the pre-weaning growth rates .... suggest that to achieve these milk yield responses from early life nutrition, calves must double their birth weight...by weaning (56 days).“

*Van Amburgh et al., 2010. Western Dairy Management Conference. Reno, NV*

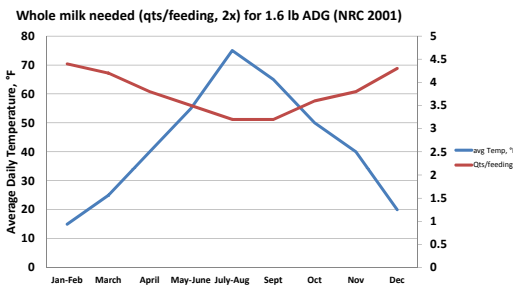
- 90 lb birth wt calf → 180 lb at 8 weeks of age
- 90 lb/56d → 1.6 lb ADG during the pre-weaning period.



Estimated daily gain (ADG) for a 100 lb calf fed whole milk or a 20-20( %CP, % fat) milk replacer

| Item                   | Gain Predicted from Energy | Gain Predicted from Protein |
|------------------------|----------------------------|-----------------------------|
| Milk Replacer 1 lb/d   | 0.39 lb ADG                | 0.52 lb ADG                 |
| Whole milk, 1 gal/d    | 1.15 lb ADG                | 0.91 lb ADG                 |
| Milk Replacer 1.5 lb/d | .78 lb ADG                 | 0.84 lb ADG                 |
| Whole Milk 1.5 gal/d   | 1.63 lb ADG                | 1.38 lb ADG                 |

*Need to feed at least 1.5 gallons/d (3 quarts/feeding) of whole milk to attain goal of 1.6 lb/d ADG (assuming little starter intake until 3 wk of age).*



Free choice starter vs limited starter feeding: comparing costs of feeding two levels of waste milk to calves. (assuming milk @ \$15.00/hundred lbs)

| Item                           | 2 quarts/feeding whole milk and starter free choice | 3-4 quarts/feeding whole milk and limited starter pre-weaning |
|--------------------------------|---|---|
| Milk fed, lb                   | 349   | 581   |
| Starter fed lb                 | 91  | 57  |
| Milk cost, \$/calf/d           | \$1.19  | \$1.55  |
| Total milk cost                | \$49.98   | \$65.10   |
| Starter cost                   | \$23.99   | \$14.99   |
| Total feed cost through 12 wks | \$73.97   | \$80.09   |
| Feed cost/lb gain              | \$0.76  | \$0.80  |

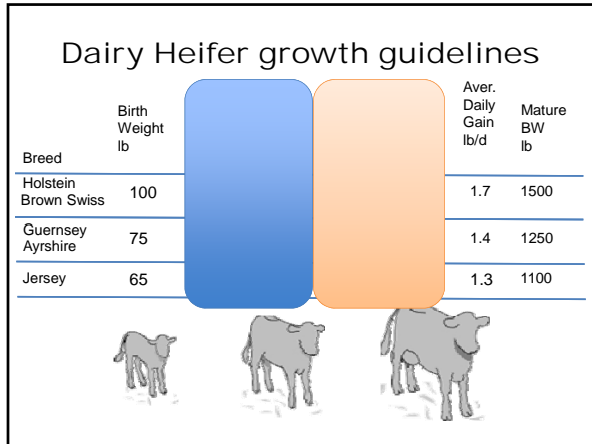
### Comparison of 'Good' and 'Poor' Grazing Cows by Genomic Testing

|                | Good Grazing Cows | Poor Grazing Cows | P <    |
|----------------|-------------------|-------------------|--------|
| Milk yield     | 21805             | 16511             | <0.001 |
| Fat yield      | 782               | 642               | <0.001 |
| Genomic PTA    |                   |                   |        |
| Net Merit \$   | 135               | 28.8              | <0.001 |
| Milk Yield, lb | 259               | -406              | <0.001 |
| Fat Yield, lb  | 15                | -3                | <0.001 |
| Fat, %         | 0.01              | 0.04              | 0.25   |

Kester, Vanderwerff and Hoffman, 2013

Post-weaning

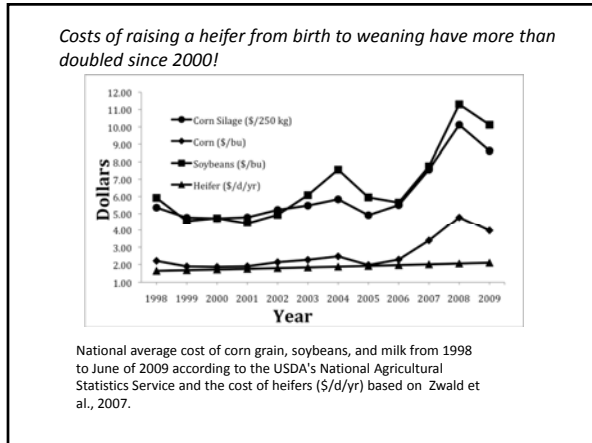




### NRC recommendations for size on heifers

55% of mature weight at first breeding  
82% of mature weight at first calving

Goal for Holsteins 1.7 lb per day ADG post-weaning



### What's it 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 and fuel                                 | \$34    | \$39    |
| Interest  | \$67    | \$69    |
| Death loss  | \$3     | \$7     |
| Labor (paid and unpaid)                           | \$255   | \$372   |
| Management (paid and unpaid)                      | \$38    | \$32    |
| Allocated cost (variable + fixed) + labor and mgt | \$1,323 | \$2,274 |

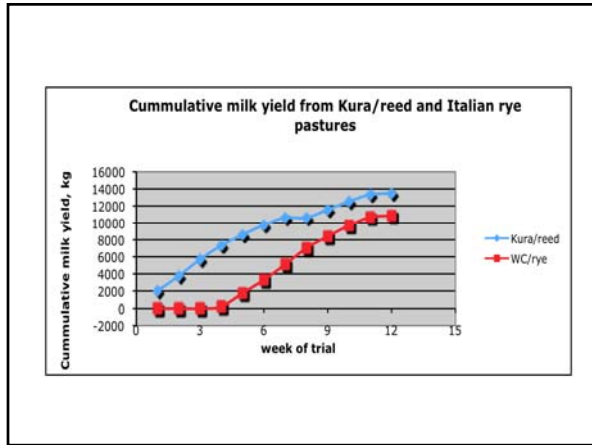
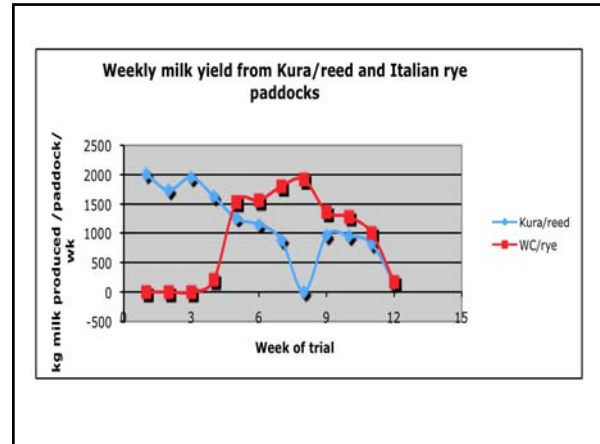
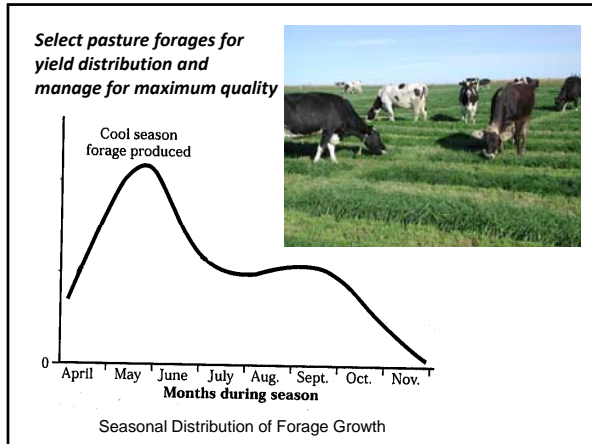
\*Survey of 32 dairy farms and custom heifer raising operations (no pasture based farms) Vanderwerf et al., 2013 UW-Extension

### Reducing costs of raising heifers by grazing

| Stage of heifer growth         | 200-700 lb   | 700-850 lb   | 850-calving  |
|--------------------------------|--------------|--------------|--------------|
| <b>Feed and Labor, \$/day*</b> |              |              |              |
| Confinement                    | \$2.18       | \$2.76       | \$3.69       |
| MIG                            | \$1.30       | \$1.50       | \$1.50       |
| Difference                     | \$0.88       | \$1.26       | \$2.19       |
| <b>X 150 grazing period</b>    | <b>\$132</b> | <b>\$189</b> | <b>\$329</b> |

\*costs based on 2008 feed and labor costs Benson, 2012 Cornell Cooperative Extension

### Pasture Yield and Quality for Grazing Heifers



**Selecting Grasses for Heifers**

Orchardgrass, Tall Fescue, and Meadow Fescue

- Want winterhardy types
- Want late maturing types
- Want good seasonal distribution of yield
- Want rust resistant types

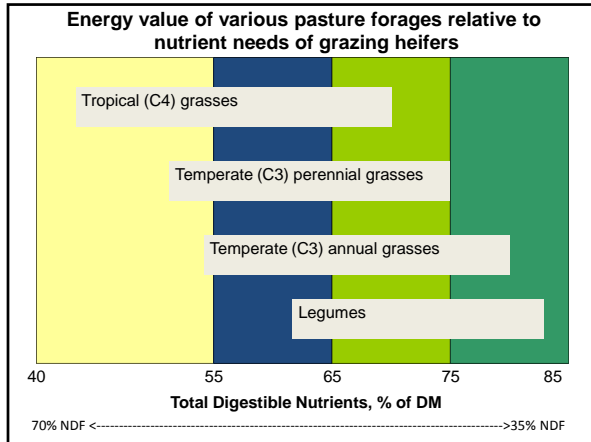
| Month | Variety 2 (%) | Variety 3 (%) |
|-------|---------------|---------------|
| May   | 40            | 25            |
| June  | 20            | 25            |
| July  | 15            | 20            |
| Aug   | 12            | 30            |



Table 5. Ration specifications for Holstein replacement heifers.<sup>1,2</sup>

| Item           | Unit         | Heifer weight (lbs) |      |      |      |      |      |      |
|----------------|--------------|---------------------|------|------|------|------|------|------|
|                |              | 175                 | 375  | 575  | 775  | 975  | 1175 | 1375 |
| Intake         | lbs/d        | 6.3                 | 11.3 | 15.3 | 18.3 | 22.4 | 26.4 | 30.4 |
| <b>Protein</b> |              |                     |      |      |      |      |      |      |
| CP             | % of DM      | 19.0                | 17.0 | 16.0 | 15.0 | 14.0 | 13.0 | 16.0 |
| RUP            | % of CP      | 40.0                | 35.0 | 32.0 | 30.0 | 25.0 | 25.0 | 30.0 |
| RDP            | % of CP      | 60.0                | 65.0 | 68.0 | 70.0 | 75.0 | 75.0 | 70.0 |
| CP/ME          | g CP/Meal ME | 65.0                | 66.0 | 65.0 | 63.0 | 59.0 | 55.0 | 61.0 |

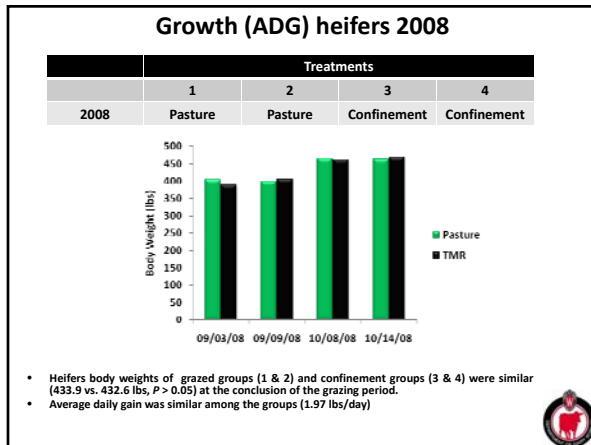
<sup>1</sup> Assumes a calving age of 23 to 24 mo with heifers weighing 1400 lbs pre-calving.  
<sup>2</sup> Prepuberty gains = 1.9 to 2.0 lbs/d; postpuberty gains = 1.7 to 1.8 lbs/d.  
<sup>3</sup> Energy levels may require reduction if ionophores are fed.  
<sup>4</sup> If RDP < 25.0% of CP, increase S to .25% of DM.



### Supplement Guidelines\* for Dairy Heifers on Pasture

| Body weight, lb | 175           | 375  | 575  | 775  | 975  | 1175 |
|-----------------|---------------|------|------|------|------|------|
| DMI             | 6.3           | 11.3 | 15.3 | 18.3 | 22.4 | 26.4 |
| Pasture NDF     | lb supplement |      |      |      |      |      |
| 45% NDF         | 5.0           | 3.3  | 1.1  | 0    | 0    | 0    |
| 50% NDF         | 5.6           | 5.0  | 3.9  | 2.2  | 0    | 0    |
| 55% NDF         | 5.6           | 6.1  | 5.6  | 5    | 6.1  | 7.2  |
| 62% NDF         | 6.1           | 6.7  | 6.7  | 6.7  | 7.8  | 8.9  |

\* Pounds as fed of 80% TDN supplement assuming pasture DMI is not limited by sward density or paddock size.



### Are there health benefits to grazing heifers?

|                   | Continuously grazed paddocks | Rotationally grazed paddocks | Feedlot raised |
|-------------------|------------------------------|------------------------------|----------------|
| # animals         | 20                           | 21                           | 21             |
| DA's              | 3                            | 2                            | 7              |
| Difficult calving | 2                            | 3                            | 5              |
| Metritis          | 0                            | 0                            | 1              |
| Ketosis           | 2                            | 0                            | 3              |
| Skeletal injury   | 0                            | 2                            | 2              |

Chester-Jones, H., M. Rudstrom, and L. Torbert. 2005. Grazing systems and management for heifers: Nutritional management and animal responses. Proc. Dairy Calves and Heifers: Integrating Biology and Management, Holiday Inn, Syracuse, NY. NRAES-175, Jan. 25-27. pp. 160-175.

### Are there production benefits to grazing dairy heifers?

|                                 | Pasture raised | Confinement raised |         |
|---------------------------------|----------------|--------------------|---------|
| Yearlings                       |                |                    |         |
| n                               | 54             | 61                 | P value |
| ADG                             | 1.97           | 1.86               | <0.05   |
| First lactation milk production |                |                    |         |
| n                               | 37             | 45                 |         |
| ME milk, lb                     | 25,328         | 23,415             | <0.05   |

Posner and Hedtke, 2012, CIAS Research Brief #89





- Take home messages**
1. Don't underfeed wet calves.
  2. Don't raise more heifers than you need.
  3. Lower forage production costs with pasture systems significantly reduce heifer rearing costs.
  4. Supplements are expensive but necessary on pastures.
  5. Reduce supplement costs by maintaining high quality pasture.
  6. Pasture reared heifers may be healthier and more productive than those raised in confinement.



**Dairy Starts Here.**



University of Wisconsin  
Department of Dairy Science

**Thank You!**

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