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Dairy Heifer Growth and Performance on Grass Pasture

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Abstract
The dairy industry in Iowa is undergoing a dramatic transformation, with many producers remodeling or building new facilities in order to expand their herd size. And during the past five years, many large herds—in excess of 1,000 cows—have been established in Iowa. Many of these operations focus on the milking cows and rely on others to provide replacement of heifers. Southern Iowa has an abundance of grass pastures that could provide an economical feed source for growing replacement dairy heifers. Objectives of this project were to measure performance and determine the economics of gain of pregnant dairy heifers when grass pasture in southern Iowa was the primary feed source.

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Introduction

The dairy industry in Iowa is undergoing a dramatic transformation, with many producers remodeling or building new facilities in order to expand their herd size. And during the past five years, many large herds—in excess of 1,000 cows—have been established in Iowa. Many of these operations focus on the milking cows and rely on others to provide replacement of heifers. Southern Iowa has an abundance of grass pastures that could provide an economical feed source for growing replacement dairy heifers. Objectives of this project were to measure performance and determine the economics of gain of pregnant dairy heifers when grass pasture in southern Iowa was the primary feed source.

Materials and Methods

A grazing research and demonstration project was initiated at the Neely-Kinyon farm in 1999 to evaluate animal performance and costs associated with raising pregnant dairy heifers on a pasture-based management system in southern Iowa. Approximately 33 acres of grass pasture was divided into eight paddocks by use of electric fencing. Replacement dairy heifers—confirmed pregnant by rectal palpation and not due to calve for at least 60 days—were used for the project. Additional animals were added as they were confirmed pregnant; late gestation animals were removed in 28-day cycles.

All heifers were placed in a paddock and allowed to graze for 1–3 days before being moved to another paddock. At that time, a floating plate sward stick was used to measure amount of available forage in both paddocks. In addition, heifers were fed approximately 1.5–2.5 lb of a corn-based concentrate mix/day to assure adequate consumption of an ionophore, trace minerals, and vitamins.

Heifer performance was determined when they were added or removed from the project and at 28-day intervals throughout the grazing season. Heifers were weighed using a portable scale; measured for height at withers using a measurement stick attached to the inside of a scale chute; and body condition scored (BCS) visually, rated on a scale of 1–5 (1 = severely emaciated; 5 = extremely obese).

Results and Discussion

Table 1 shows total number of heifers used each year and distribution by breed. Fewer pregnant heifers were available in 2000; consequently, the number of heifers in the project was less that year compared with the other two years.

Average monthly precipitation and average daily high and low temperatures for the summer grazing period are shown in Figures 1 and 2, respectively. Rainfall was greater and temperatures cooler in 1999 than in the subsequent two years. Summaries of estimated available and consumed forages have not been completed. Overall, heifers gained bodyweight; experienced skeletal or frame growth; and increased body condition scores. Average daily bodyweight gains were largest in 1999, and were consistent with growth rates required for large-breed dairy heifers. Frame growth, measured as height at withers, increased each year, being greatest in 1999. Animals gained BCS during the first two years of the project, but average BCS remained constant in 2001.

Table 3 shows cost/day for heifers on pasture and cost/lb gain. Less supplemental grain was fed in 2001 (1.8 lb/hd/d) than in 1999 (2.1) or 2000 (2.4 lb/hd/d).

Table 1. Number of pregnant dairy heifers by year and breed.

Breed	1999		2000		2001	
Ayrshire	7	10%	3	9%	5	8%
Brown Swiss	11	15%	5	14%	5	8%
Guernsey	1	1%	1	3%	6	9%
Holstein	38	52%	18	51%	37	56%
Jersey	14	19%	5	14%	7	11%
Milking Shorthorn	2	3%	3	9%	6	9%
Total no. of heifers	73		35		66	

Table 2. Performance of pregnant dairy heifers on grass pasture by year.

Parameter	1999	2000	2001
Date heifers pastured	4/29/99	5/24/00	5/9/01
Date heifers removed from pasture	11/10/99	8/16/00[1]	8/29/01
Length of grazing season, days	196	84	112
Avg. days grazed/heifer	92.8	58.9	61.8
Avg. body weight gain, lb/days	1.61	2.11	1.40
Avg. gain in height at withers, in	2.52	1.11	2.05
Change in body condition score	0.41	0.30	0

[1] Pregnant heifers grazed standing corn from 8/16/00 until 10/11/00. Nonpregnant heifers were pastured from 8/16/00 until 10/11/00 (data not included in summary).

Table 3. Economics of gain for replacement dairy heifers on grass pasture[1], Neely-Kinyon Research and Demonstration Farm,Greenfield, Iowa, 1999–2001.

Parameter	1999	2000	2001
Total cost excluding labor			
No. heifers	73	54[2]	66
$/head/day on pasture	$0.30	$0.53	$0.57
$/lb of gain	$0.51	$0.55	$0.41

[1]Total cost excluding labor.
[2] Includes 19 nonpregnant heifers pastured from 6/16/00 until 10/11/00.

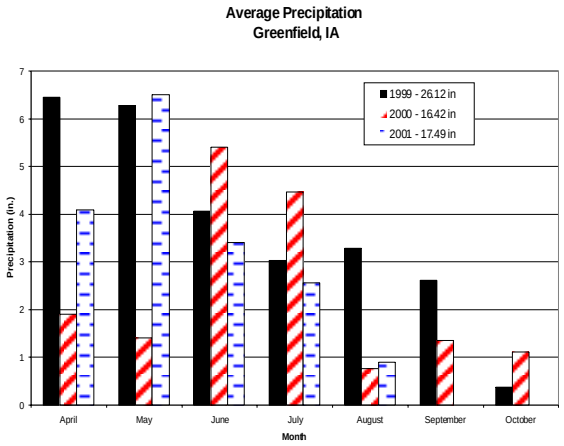

Figure 1. Monthly precipitation at Greenfield, IA.

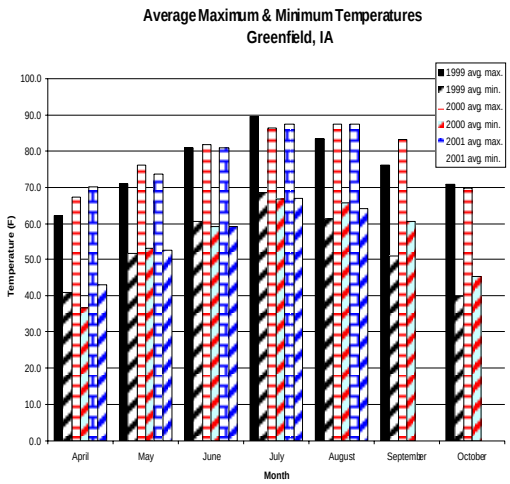

Figure 2. Monthly high and low temperatures at Greenfield, IA.