

**OHIO AGRICULTURAL EXPERIMENT STATION**  
**WOOSTER** **OHIO**

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## **FEED COSTS FOR RAISING DAIRY HERD REPLACEMENTS ON HIGH ROUGHAGE SYSTEMS**

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### **INTRODUCTION**

The cost of feeding dairy heifers is an important expense item in present-day dairy operations. More specialized and intensive use of dairy farm resources for the output of milk has caused some dairymen to question the value of raising their own herd replacements and to consider the desirability of farming out their calves to farmers who have indicated an interest in raising dairy herd replacements on a contract basis.

The major expense in raising herd replacements is the feed. It represents about two-thirds of the total costs when calculated on a barn feeding basis. Therefore a feeding program based on maximum use of low-cost, high quality roughage offers the most economical approach to the dairy herd replacement enterprise. Whether or not raising herd replacements becomes a profitable undertaking then may large depend on the successful combination of feeding practices with the best use of other expense items, including labor, bedding, shelter, fencing and water supply. The best managerial results are largely predetermined by the facilities available at each farm.

### **FEEDING PROCEDURES**

Records kept of the feed consumption of large and small breeds of dairy cattle in conjunction with various growth studies at the Ohio Agricultural Experiment Station have resulted in accurate data which have been used to estimate feed costs of raising heifers in dry lot from birth to 25 months. The amounts of feed consumed are given in Table 1.

**TABLE 1.—Amounts of Feed Consumed by Dairy Heifers Raised to 25 Months on Ohio High Roughage System**

Feed Item	Birth								Birth to 108 wk.	
	to 26 wk.	27 to 36 wk.	37 to 48 wk.	49 to 60 wk.	61 to 72 wk.	73 to 84 wk.	85 to 96 wk.	97 to 108 wk.		
<b>Light Breeds*</b>										
Milk, (lb.)	305									305
Grain, (lb.)†	310	127	179	240	252	284	304	327		2073
Hay, (lb.)	710	337	607	738	802	864	979	928		5805
Silage, (lb.)	0	343	536	681	754	851	828	913		4906
<b>Heavy Breeds</b>										
Milk, (lb.)	380									380
Grain, (lb.)	350	181	226	238	259	279	339	333		2205
Hay, (lb.)	820	538	699	728	840	947	1107	1138		6817
Silage, (lb.)	0	525	612	686	769	838	989	1041		5420

\*Average feed consumption for Jersey calves to six months was milk, 250 pounds; grain, 260 pounds; and hay, 550 pounds.

†Simple (15 percent protein) grain mixture. For calves raised on the dry calf starter system add cost of calf starter.

The amount of feed eaten to six months of age are averaged results obtained from experiments in which several hundred calves were raised on the Ohio High Roughage System (1). In these trials the calves were allowed to nurse their dams for three days. A maximum amount of milk was fed to the end of the first week (16 pounds per day for large breeds and 10 pounds per day for small breeds) after that the amount of milk fed was gradually reduced until milk feeding was ended at seven weeks of age.

Hay was fed free choice from the fourth day of age and grain was limited to one-half the amount of hay being consumed with a maximum daily grain intake limited to three and four pounds respectively for Jerseys and Holsteins. Mostly soft textured, good quality legume hay was used. A simplified grain mixture composed of ground corn, ground oats, wheat bran, soybean oil meal, steamed bone meal and iodized salt was fed. It contained approximately 15 percent total protein.

Feed consumption data for the period of six through 25 months of age were obtained with 10 growing heifers (four Holsteins, two Guernseys, two Red Polls and two Brown Swiss). The results are reported in Table 1 by 12-week periods to enable substituting of 12-week pasture periods at any age bracket. The cattle were maintained on a high roughage ration of about four parts roughage to one part grain on the dry basis. In practice this was accomplished by feeding mixed hay, corn silage and grain in a 4:3:1 ratio. About 15 percent of the hay was refused, which assured maximum roughage intake.

### **RELATED EXPERIMENTS**

A variety of forages have been tested at the U.S.D.A. Agricultural Research Center at Beltsville as the roughage component of high roughage rations for dairy heifers (2). Jersey and Holstein heifers were fed limited whole milk for 60 days and grain feeding was limited to nine months.

Thirty-four heifers in the Beltsville experiment consumed about 560 pounds of grain on the average during the first eight or nine months after which grain feeding was terminated. They were fed six different combinations of forages: alfalfa hay alone, alfalfa hay and corn silage; alfalfa hay plus timothy hay and corn silage; alfalfa hay plus timothy hay and orchardgrass-ladino hay; brome grass-ladino hay; brome grass-ladino hay and corn silage; and orchardgrass-ladino hay and corn silage. These heifers attained the normal expected size for their respective breeds at 24 months of age. The combination of forages used did not appear to affect growth rates significantly.

### **CALCULATION OF FEED COSTS**

Feed costs for the 25-month period are shown in Table 2. In addition to the cost of actual feed consumed, 15 percent was added to the hay cost to compensate for the cost of refusal. The data were terminated at 25 months since several of the heifers calved before the next three month period ended. The data for the 97 to 108 week period may be applied to periods after 108 weeks should heifers be held over to 28 or 31 months since feed intake would not change much during the next few months. Here again the cost figures are given by 12-week intervals to allow substitution of 3-month pasture periods at any age level above six months. Three dollars a month may be used for pasture costs. For purposes of comparison feed costs are included in Table 2 based on the feed consumption of the group of heifers fed alfalfa and timothy hay and corn silage in the Beltsville experiment.

**TABLE 2.—Feed Cost of Raising Barn Fed Dairy Heifers When Fed High Roughage Rations**

Age Period	Relative Cost*				
	Ohio (Jerseys)	Beltsville (Jerseys)	Ohio (Guernseys)‡	Ohio (Holsteins)§	Beltsville (Holsteins)
Birth to 26 weeks†	\$28.22	\$ 30.45	\$ 33.42	\$ 36.17	\$ 44.96"
27 to 36 weeks	-----	14.70	10.74	16.38	19.01
37 to 48 weeks	-----	14.56	17.33	20.50	22.89
49 to 60 weeks	-----	16.50	21.91	21.74	24.12
61 to 72 weeks	-----	17.33	23.63	24.40	27.55
73 to 84 weeks	-----	19.10	26.07	27.03	26.56
85 to 96 weeks	-----	17.14	28.19	32.04	29.98
97 to 108 weeks	-----	18.01	28.65	32.63	32.10
Total		\$147.79	\$189.94	\$216.97	\$227.17

\*Based on the following prices per 100 pounds: milk, \$5.00; grain, \$3.00; hay, \$1.25; and corn silage, \$0.60.

†For calves raised on the dry calf starter system add extra cost of high protein calf starter to first six months.

‡Includes data obtained with two Red Poll heifers after six months.

§Includes data obtained with two Brown Swiss heifers after six months.

||Higher cost of raising Beltsville calves to 26 weeks is largely due to a longer milk feeding period.

## REFERENCES

1. Hibbs, J. W., Conrad, H. R., and Pounden, W. D. High Roughage Feeding Offers Way to Low Cost Dairy Calves. Ohio Farm and Home Research, 41:304. January-February, 1957.
2. Converse, H. T. High Roughage Rations for Dairy Heifers. Production Research Report, No. 15, U.S.D.A. Agricultural Research Service. 1957.