4-2011

Heifer Development Management: One Size Does Not Fit All

Matthew Stockton
University of Nebraska-Lincoln, mstockton2@unl.edu

Roger K. Wilson
University of Nebraska-Lincoln, rwilson6@unl.edu

CORNHUSKER ECONOMICS

University of Nebraska–Lincoln Extension

April 27, 2011

Institute of Agriculture & Natural Resources
Department of Agricultural Economics
http://agecon.unl.edu/cornhuskereconomics

Heifer Development Management: One Size Does Not Fit All

Market Report	Yr Ago	4 Wks Ago	4/22/11
Livestock and Products, Weekly Average			
Nebraska Slaughter Steers, 35-65% Choice, Live Weight	$100.39	$115.00	$119.48
Nebraska Feeder Steers, Med. & Large Frame, 550-600 lb.	130.35	151.23	154.00
Nebraska Feeder Steers, Med. & Large Frame 750-800 lb.	116.10	133.64	138.12
Choice Boxed Beef, 600-750 lb. Carcass	167.81	187.66	187.38
Western Corn Belt Base Hog Price Carcass, Negotiated	80.32	83.61	90.74
Feeder Pigs, National Direct 50 lbs, FOB	*	*	*
Pork Carcass Cutout, 185 lb. Carcass, 51-52% Lean	88.51	93.06	95.50
Slaughter Lambs, Ch. & Pr., Heavy, Wooled, South Dakota, Direct	*	204.50	190.00
National Carcass Lamb Cutout, FOB	292.34	389.32	402.07
Crops, Daily Spot Prices			
Wheat, No. 1, H.W. Imperial, bu.	3.93	7.06	8.39
Corn, No. 2, Yellow Omaha, bu.	3.44	6.61	7.50
Soybeans, No. 1, Yellow Omaha, bu.	9.94	13.35	13.90
Grain Sorghum, No. 2, Yellow Dorchester, cwt.	5.41	10.98	12.20
Oats, No. 2, Heavy Minneapolis, MN , bu.	2.05	3.46	3.98
Feed			
Alfalfa, Large Square Bales, Good to Premium, RFV 160-185 Northeast Nebraska, ton.	135.00	140.00	140.00
Alfalfa, Large Rounds, Good Platte Valley, ton.	92.50	72.50	72.50
Grass Hay, Large Rounds, Premium Nebraska, ton.	*	*	*
Dried Distillers Grains, 10% Moisture, Nebraska Average.	101.00	196.50	221.00
Wet Distillers Grains, 65-70% Moisture, Nebraska Average.	34.50	69.50	79.50

***No Market**

A substantial cost to beef cattle producers is the development or purchase of replacement females. Each year, beef cattle producers may replace as many as 20 percent of the herd, with the average being close to 16 percent. With so much of the producer's success riding on the proper care, development and cost of supplying replacement heifers, it is no surprise that the literature is filled with studies devoted to determining the ideal maturity and strategies to develop them.

While the question of determining beef heifer replacement strategies has been studied in some detail, the complexity of relationships between the contributing factors and an ever changing industry invite updating and improvement in the methodologies used to manage and study this topic.

The relationship between nutrition, growth and sexual development is well documented. What is not so well known is the interaction of these components and the profitability of individual animals. Analysis has been limited to comparing cost differences between groups of animals, without consideration for variation within those groups. Recent work by a joint team of agricultural economists and animal scientists has identified some key variables cow/calf producers should consider when selecting and developing their replacement heifers.

While no surprise to those in the business, it has been verified that cattle of different sizes require different management regimes to maximize profitability. Comparing the profitability potential between individual heifers is possible with the development of a profit scoring model that predicts breeding maturity based on age, weight at pre-breeding, nutrition, birth weight, dam size and dam age. This prediction of maturity is known as MI, which stands for Maturity Index, since it uses many factors in deriving a maturity. The measure is relevant at the time of first breeding and uses information easy for producers to obtain. The measure can be interpreted as the actual percent of mature size, and is very useful in predicting pregnancy and dystocia rates.

Traditionally, heifers are managed in a group and developed under a single management regime. This current work demonstrates that the economic performance of individual heifers varies greatly within a group, depending on their individual MI scores. The score itself is affected by the method of development, specifically nutrition.

For example, consider a heifer that is 390 days of age at pre-breeding, born to an 11-year old dam that weighs 1,420 pounds at maturity. Her expected profit score is 389.86 when fed at the low level of nutrition. At the low level of nutrition this heifer is expected to have a pre-breeding weight of 569 pounds. This compares to an expected profit score of 747.32 for this same heifer, fed at the higher plane of nutrition. Her expected pre-breeding weight is 676 pounds, more than 100 pounds heavier. This simple change in management creates a 357.46 dollar profit advantage to the better fed heifer.

On the other hand consider a heifer that is older, 456 days of age at pre-breeding, from a younger and smaller dam, seven-years old and weighing 800 pounds at maturity. Her expected profit score is 660.88 dollar points when managed at the higher level of nutrition, resulting in a 741 pound pre-breeding weight, compared to a 784.50 profit score when managed at the lower level of nutrition, resulting in a 634 pound pre-breeding weight. In this case, the heifer fed the lower levels of energy and protein has a profit advantage of 123.62. The difference between these two animals illustrates the effects of age, size and nutrition on the profitability of heifers with varying characteristics.

Several general conclusions are drawn from the study: 1) specific combinations of heifer age and potential size determine the nutritional development regimes needed to optimize their profitability, 2) potentially large heifers require more days of age and higher levels of nutrition during development in order to optimize profits, 3) managed correctly, heifers that grow to a larger mature size are more profitable than those that grow to a smaller mature size, 4) potential for loss is greater for large heifers fed too little then for small heifers fed too much, and 5) the more homogeneous the group of heifers with respect to the maturity variables, the more that group benefits from the appropriate management regime.

Armed with this knowledge, producers can begin to strategically manage their heifer development programs. Producers' abilities and competitive advantages vary from place to place and person to person. The heifer selection process that best suits the resources and management capabilities of the individual should be followed. Producers with the philosophy that survival of the fittest is an important component of heifer development should probably select heifers that will mature at a fairly small size and that are older among their peers. On the other hand, a producer whose goal it is to produce larger calves will likely be choosing animals with growth potential, and will need to supply extra nutrition when developing replacement animals.

The potential for problems increase when the management regime does not match the animals retained. Producers with older heifers from animals with a smaller mature size may increase their profitability by reducing feed inputs during the development stage; the key is to not overdo it. Producers with "growthy" animals may find that expenditures in feed for heifer development are more than offset by production increases in pregnancy, reduced calving difficulties and re-breeding problems.

Uniformity among heifers is vital when they are managed as a group. As seen above, heifers that are not matched to the correct management regime fail to produce at a level needed for maximum profitability. Identifying animals that have the best chance of success in your program, or using a developmental program that matches your choice of animals, is the best way to increase individual animal and herd profitability.

There are two key management questions that every producer should always keep in mind, 1) "What is the management regime that brings my business where I want it to be, and what steps are needed to get it there?" (the long-run question), and 2) "Given the cattle and resources I currently have, what is my best management regime?" (the short-run question). The first question ensures long-term success, measured as creating the business that matches well with both financial and personal objectives. The second question relates to the current circumstances and relates well to business necessity and short-term financial performance.

It is often a battle to balance these two outcomes. In this case, this is demonstrated by the choice of heifers to retain. If a producer's long-term objective is to reduce management inputs and be less dependent on outside resources, he/she may wish to reduce cow size, as reflected by heifer selection. However, if his/her cows currently average 1,400 pounds at maturity, he/she may currently use a method of development that requires more outside resources then the management regime they wish to eventually have requires. It is the successful producer who knows how to balance these two objectives, through the selection process and the choice of management regimes to apply.

Matthew Stockton, (308) 696-6714
Associate Professor, Dept. of Agricultural Economics
West Central Research & Extension Center
University of Nebraska-Lincoln
mstockton2@unl.edu

Roger Wilson, (402) 472-1771
Analyst, Dept. of Agricultural Economics
University of Nebraska-Lincoln
rwilson6@unl.edu