

COMMON SENSE HEIFER MANAGEMENT

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INTRODUCTION

The replacement heifer is a mixed blessing for cow-calf operators. On one hand, she represents the future profitability and genetic improvement of the cow herd; thus her selection and development are of paramount importance to the continued success of any cow herd.

On the other hand, the replacement heifer is an inconvenience at best. She is essentially non-productive for the first two-and-a-half years of her life; thus she places a significant drain on a rancher's cash flow, making her easy prey for mismanagement. Nevertheless, proper growth and development of the replacement female from birth until she produces her first calf is of critical importance for her to become a highly productive part of the cow herd.

With this in mind, the concept of "*professional heifer development*" was first conceived in the late 1980's as a result of a research/teaching program conducted at Kansas State University by Dr. Larry Corah and Dr. Patsy Houghton. Houghton went on to form Heartland Cattle Company in 1990, which is a commercial business designed to produce genetically superior bred females for ranchers that excel in their on-ranch performance while producing high quality, consistent beef for consumers. To-date, Heartland Cattle Company has turned out over 71,000 AI bred heifers that have been placed into 31 states. In addition, nearly 120,000 bawling calves have been weaned and started; over 75,000 cattle have been fed to finish; and nearly 40 research projects have been completed, including FDA controlled studies for clearance of product usage in replacement heifers and feeder cattle. Heartland Cattle Company enjoys long-term customer relationships with an average annual customer retention rate of over 97%. Long-term, high quality employees are another hallmark of the Company, and are largely responsible for much of the Heartland success story. Heartland Cattle Company along with our customers (*many who have been with us since our first couple of years in business*) will be celebrating twenty years of professional heifer development in 2010. Much of the information presented in this paper is from benchmark data collected from these customers' cowherds over the past nineteen years. All of us at Heartland Cattle Company, along with our valued customers, hope you might benefit from our combined years of experience of *Common Sense Heifer Management*.

WHAT IS PROFESSIONAL HEIFER DEVELOPMENT?

When heifer development programs are talked about, many people think *only* about how the heifers are fed. In fact, the nutritional program is *only one facet* of proper heifer development. Professional heifer development is really defined by a variety of customer services. A full-

service professional heifer development program will also include genetic consultation, an effective estrus synchronization and heat detection program, a total artificial insemination (AI) and/or embryo transfer (ET) program, helping ranchers define and meet their targeted goals, effective data management and summary, providing user-friendly ranch records, placing the desired selection pressure on fertility via the feeding program and/or length of the breeding season, sending heifers back to the ranch that are easy to handle and providing on-going cowherd consultation.

These services all need to be provided to customers in a cost effective format, and must rely on economies of scale to do so. Very simply, customers will vote with their return business if a program is providing them “*good value per dollar spent.*” In this case, “*value*” is gauged largely by subsequent longevity of the heifers when, and if, they can be *economically* retained in the rancher’s mature cowherd. Long-time benchmark data from Heartland Cattle Company shows an *eight percent improvement in second-calf rebreed rate* across herds and locations when professionally developed heifers are compared to heifers previously developed on-ranch. Add this to an *average ten-plus year productive lifetime in the cowherd*, and the subsequent value of a well managed professional heifer development program speaks for itself.

WHY PROPER HEIFER MANAGEMENT IS PROFITABLE

1. *Reduced breeding costs.* Stringent culling eliminates poor replacement prospects prior to investing time, labor and expense into breeding these heifers. Over the years, pre-breeding soundness exams at Heartland Cattle Company have resulted in an average 3 to 9% culling rate prior to breeding. Reasons for culling have included small pelvic area, infantile reproductive tracts and/or various functional soundness problems. When these poor replacement prospects are identified prior to breeding, it allows the rancher to merchandise them in a timelier manner, thus improving cash flow and reducing total carrying costs.
2. *Improved conception rates.* Only early born, efficient gaining heifers should be kept as replacement prospects. In addition, pre-breeding soundness exams can help identify those heifers that are the most likely to conceive. These advantages, combined with proper nutritional development, result in optimal first service conception rates and pregnancy rates.
3. *Heavier calves at weaning.* Estrus synchronization results in an earlier average conception date within a defined breeding season. This translates into older, heavier and more uniform calves at weaning. In addition, the use of high accuracy expected progeny difference (EPD) sires can result in calves with superior genetics for gain efficiency. *Please keep in mind that calves with superior growth genetics are not necessarily large framed cattle.* The key is to identify moderate framed cattle with superior growth (lbs.) that still have the ability to reach puberty at an early age.
4. *More uniform calf crop.* The use of high accuracy, multiple trait AI service sires result in a calf crop with more uniform genetics for growth, frame, muscle, etc. This leads to increased quality and predictability of steer and heifer progeny, and makes retained ownership and grid marketing at harvest viable options.

5. *Decreased bull costs.* With the incorporation of an AI program, fewer bulls will be purchased and maintained by cow-calf producers. Without the need for “heifer bulls,” this also means simplification of pasture management systems for the rancher.
6. *Less calving difficulty.* AI sires with high accuracy EPD’s for calving ease result in less calving difficulty, calf loss, heifers that breed back earlier and increased cowherd productivity. Data collected from Kansas State University and Heartland Cattle Company indicate an average improvement in weaned calf crop by 7% when heifers are placed in a developmental program with proper nutrition, along with estrus synchronization and AI.
7. *Decreased labor at calving.* Heifers that undergo estrus synchronization will calve in a shorter period of time. This decreases labor requirements at calving and increases the amount of time that could be devoted to other enterprises. *More importantly, a concentrated calving season simplifies subsequent nutrition, health and marketing programs for the rancher.*

HOW CAN I ACHIEVE THESE GOALS?

By following proper heifer development procedures, producers have a better chance of incorporating a female into their herd that will be productive for years to come. Research conducted at Heartland Cattle Company shows a successful program revolves around the following points.

1. Heifers should mature into cows that weigh 1100-1300 lbs, depending on available feed resources. *The key is to match weight with appropriate frame.* Be careful when selecting for lighter weight cattle in hostile feed resource areas that you are not inadvertently selecting for hard-keeping, inefficient cattle. For example, a heifer that matures at 1100-1150 lbs. should have a “high four” frame score. Frame score “six” heifers that mature at 1100-1150 lbs are simply narrow, light muscled, hard fleshing females!
2. Heifers should be moderate framed. Data from Heartland Cattle Company shows that medium framed heifers, within a biological type, have the highest fertility year-in and year-out. Taller, larger framed heifers have a longer growth curve and tend to reach puberty later.
3. Color is a personal preference, but an important perception when trying to establish a uniform cow herd. Our preference for a commercial herd is a solid black or red bodied heifer. A white or mottled face is acceptable if there is pigment around the eye for reducing the incidence of pink eye.
4. Don’t forget the advantages of hybrid vigor! A *planned* crossbreeding or composite program will return big dividends in the form of improved fertility, growth, longevity and immune response. The key is to *develop a closely controlled plan and stick to it* so that consistency and uniformity are not sacrificed.

5. Heifers should have genetic merit for maternal ability, growth and carcass traits.
 - a. *Maternal traits.* Select for a high quality udder and optimal milk production. Milk production should not be so high that it interferes with fertility within a particular feed resource environment. In addition, females should show natural protective behavior toward their calves without being over-aggressive toward people when managed in their natural environment.
 - b. *Growth traits.* Females should produce moderate framed, fast gaining, and easy fleshing heifer calves for replacements. Feed yard progeny should mature at 1,200 to 1,400 lbs, with the ability to gain weight rapidly at minimal dry matter conversion rates.
 - c. *Carcass traits.* Females should consistently produce calves that can be harvested by 13 to 14 months of age with Choice, Yield Grade 2 carcasses. Carcasses should normally weigh between 700-950 lbs. depending on the marketing grid, and loin eye area should normally range from 12.0 to 15.5 square inches.
6. Heifers should have a calm disposition. Cattle with a quiet disposition exhibit better fertility, immune response, weight gain and meat quality. This also means less wear-and-tear on facilities *and ranchers!*
7. Heifers should have a permanent, highly visible identification so genetic merit and production ability can be measured and recorded for each individual.
8. Heifers should be structurally sound and have functionally sound eyes, teeth, jaw, and udder.
9. Heifers should be fully vaccinated on a timely schedule. Research published by Heartland Cattle Company shows proper preconditioning programs can effectively reduce treatment rates by as much as 20%. Also, it is extremely important that heifer calves are officially calf hood vaccinated (OCV) for brucellosis *prior to ten months of age*. After ten months of age, heifers run a risk of showing a positive titer for brucellosis as a young cow.
10. Biosecurity issues cannot be ignored! High-risk cattle associated with Persistently Infected Bovine Viral Diarrhea (PIBVD), Johnne's and Listeriosis should be eliminated via appropriate testing procedures.
11. Heifers should undergo a reproductive soundness exam 35 to 45 days prior to breeding, including a reproductive tract score, body condition score, pelvic measurements, body weight, frame score and functional soundness evaluation. When considering pelvic measurements, a conservative view is encouraged. Since there are differences between technicians and instruments when measuring pelvic area, we prefer to use these measurements only to sift out obvious problems, and bottom-end cattle. These measurements can also be useful in identifying and tracking sire lines that propagate potential pelvic area problems in their daughters.

12. Feed heifers a *high roughage-limit fed* diet to weigh 60-65% of their mature body weight when bred for the first time. Optimum gain and breeding weight will vary according to customer request regarding selection pressure on fertility, body condition and estimated mature weight. Some producers prefer to develop their heifers to only 50-55% of their mature body weight. On the upside, the latter program will place more selection pressure on replacement heifer fertility. On the downside, pregnancy rates will likely be 10 to 15% lower than heifers developed to 60-65% of their mature body weight; *and in the case of a significant environmental challenge, heifer pregnancy rate might be reduced by as much as 50%*. Other disadvantages of lighter developmental target weights can be increased calving difficulty and weak calves.
13. We prefer heifer body condition score (BCS) to be at 5.5 to 6.0 at time of first breeding. *From a practical standpoint, visual BCS is the target measure actually used rather than percentage of body weight* because of the labor necessary to take repeated weights. When these two measures are related, heifers developed to ~50% of their mature weight will have a BCS of four, whereas heifers developed to 60 to 65% of their mature weight will have a BCS of 5.5 to 6.0. This level of development provides the heifer a margin for error of approximately one-half of a BCS, and helps ensure she will not go downhill quickly in the case of a significant weather challenge during her last trimester of pregnancy, which can result in calving difficulty, weak and/or dead calves and poor breed back. It's also important to note that a first-calf heifer is still developing through her first calving. This is unlike a mature cow that simply needs to maintain her body weight. A good human analogy might be that Grandma doesn't require the same caloric intake to maintain her weight as does her 16-year-old growing granddaughter who is a competitive athlete!
14. Heifers should be synchronized to breed at 13 to 14 months of age. *This might be the most important criteria related to first service conception rate in heifers*. It doesn't matter if the heifer has adequate flesh if she is simply too young to be cycling. Over time, we have observed an average reduction in first service conception rate of 5-15% in twelve vs. fourteen month old heifers. This is why it is important to select potential replacements from your early born heifer calves!
15. Heifers should be bred to *proven multiple trait, outcross, calving ease sire/s at least 21 days ahead of the mature cow herd*. This gives the producer at least one extra cycle to rebreed heifers and still keep them on a timely calving schedule. Additionally, ranchers can devote all of their attention to first calf heifers if they calve before the mature cow herd. The recent onset of some severe genetic defects in our nation's beef cattle population brings home the importance of using "outcross" genetics. This means you must be able to define the genetic background of your heifers before selecting a service sire/s. There is no doubt, in the cattle industry's quest for product consistency, the genetic base of several of our beef breeds has narrowed. The net result of fewer genetic lines within any breed is a greater chance of line breeding and/or inbreeding. These closely related genetic matings can result in the expression of genetic defects in newborn calves, and/or increased embryonic death loss due to the sloughing of abnormal embryos. *In fact, early embryonic death has been shown to be one of our biggest challenges related to beef cattle fertility!*

16. Approximately 70% of all heifers should conceive by artificial insemination, on their first service, to a high accuracy EPD, multiple trait service sire.
17. Heifers should be pregnancy tested at 45 to 90 days post-breeding so open heifers can be identified early for feeding and harvest.
18. Heifers should continue to be developed on a high roughage diet so they will achieve 80-85% of their mature body weight by the time they calve the first time.
19. Heifers should calve unassisted at 22-23 months of age, raise a healthy, high quality calf and provide optimal milk production for calf growth as defined by the ranch grass resources.
20. Heifers should develop into a mature cow that will consistently rebreed on minimal inputs within a 365-day calving interval, over a productive lifetime of *at least* seven years.

SHOULD I CONSIDER PROFESSIONAL HEIFER DEVELOPMENT?

Since Heartland Cattle Company originated the concept of professional heifer development in 1990, it has since become a recognized sector of the beef cattle industry. Since its inception, countless articles have been written on professional heifer development and others have worked to establish similar programs. While this has been a positive move in the cattle industry, it has caused many producers to question if they should consider professional heifer development for their beef cattle enterprise.

When deciding if professional heifer development makes sense, it is important the rancher takes the following into account:

1. *Opportunity value of his labor, land, feed resources and facilities.*
2. *Accountability of the heifer development program in question.*
3. *Value per dollar spent.*

To properly evaluate these points a rancher might be ahead if he asked himself the following questions:

1. Do I have the labor force, technical expertise, and facilities necessary to effectively handle a heifer development and breeding program?
2. Do I have the time to devote to a heifer development program, or would it be more efficient and profitable to concentrate my time and resources toward my *mature cowherd* and/or farming enterprise.
3. Do I have enough heifers to make it economically feasible for me to devote my time, labor and facilities to developing and breeding heifers; or would I be ahead to forward contract professionally developed, bred heifers with known genetics?

4. Should I consider becoming a specialized terminal producer where I place all of my calves (heifers and steers) into a feeding program, and buy professionally developed bred heifers with the proper maternal genetics? Would this concept allow me to more efficiently market my entire calf crop, reduce my labor requirements, and increase my overall profitability?
5. ***Would it be more profitable to increase my mature cow herd numbers, rather than devoting my grass resources to developing replacement heifers that will provide me no saleable product for two-and-a-half years? This is a very important consideration for ranchers!*
6. Should I develop my replacement heifers elsewhere so I can direct my strongest grass resources to my two-and three-year-old cows?
8. What is the long-term comparative cost of buying non-descript heifers with no known information behind them as opposed to purchasing professionally developed heifers with known genetics?
9. If I do commit to a heifer development program, is it managed in such a way that I am assured of AI pregnancies vs. clean-up bull pregnancies?
10. Does the heifer development program under consideration have any history of success, and can they document reproductive performance? Are they able to offer multiple references?
11. Could I improve my bottom-line profitability by calving estrus synchronized heifers bred to high accuracy EPD bulls in terms of improved conception rate, earlier calving date, less calving difficulty, improved retention of second and third calvers, improved cowherd longevity, more uniform and predictable genetics and reduced bull requirements?

These are all important points, and the answers will not be the same for everyone!