Considerations for managing beef cows in confinement
Patrick J. Gunn, Ph.D., Joe Sellers, Chris Clark, DVM, and Lee Schulz, Ph.D., Iowa State University

Introduction
Continued volatility of grain markets, coupled with recent summer droughts, has had a significant impact on the Midwestern cow-calf sector in recent years. These factors, along with decreased land availability for grazing and forage production, has resulted in increased cost of production and left many producers pondering alternative management systems for their herds. One such management alternative that is capturing the interest of many producers is the concept of confinement housing of the cow herd. In many parts of the United States, where year-round grazing is either not feasible, or is not implemented, confinement housing of the cow herd is not necessarily a novel practice. Often times, cows are placed on a sacrifice paddock or drylot with varying degrees of access to shelter for a period of time during the winter months, leading up to and sometimes through the calving season. However, with reduced land access and increasing forage prices, an increased proportion of producers are managing cows in confinement during times of the year traditionally devoted to grazing. With these management alterations come various considerations that should be acknowledged.

Yardage and facilities
Spacing needs per cow-calf unit will vary depending on the confinement system being implemented. If utilizing a drylot scenario, a general rule of thumb is 500-800 square feet per pair, although recent studies at the University of Nebraska and North Dakota State University have used 400 and 1200 square feet per pair, respectively. However, in well drained soils and lots that have mounded areas, it may be possible to maintain performance on as little as 250-300 square feet per cow-calf unit. In an under-roof scenario where cows are not given access to a drylot, most recommendations suggest a minimum of 80 square foot per pair, with a 120 square foot or more needed per pair if the same pen is utilized for calving. Also, though not a requirement, it is strongly suggested that first calf heifers are able to be individually penned at calving to allow for bonding time and ensure adequate colostrum intake by the calf. If utilizing lower-end square footage recommendations for under roof confinement, a creep or refuge area that only calves have access to should be considered.

If new facilities are not being constructed and adaptations to existing structures and lot are being made, bunk space is often the limiting factor. If using a fence-line bunk system, plans should be made for 24 inches of linear bunk space per gestating cow, and up to 36 inches per cow-calf pair to include a calf at side that may consume feed. If utilizing bunks where cows and calves can eat from both sides simultaneously, 48-60 inches of linear bunk space should be allotted depending on cow size. As with any cow-calf system, best management practices include separating fist-calf heifers from the remainder of the herd and dividing young and old cows into separate groups if feasible. If facilities restrict the ability of group separation, then increasing bunk space may be necessary to ensure that subordinate cows have ample access to the feed needed to support their current stage of production.

Calving and health
In a similar manner to yardage, calving and health considerations may be heavily dependent on the type of management system that is in place. Drylotting vs. “under-roof” confinement, as well as duration of confinement will play a role in how cow-calf health should be monitored. From a calving perspective, confinement offers better opportunities to monitor, catch, and provide assistance to cows during parturition. Because 80% of calves lost at birth are “normal,” but likely die due to delayed calving, the ability to more easily intervene during labor is likely of significant monetary impact. Moreover, as cows with increased calving difficulty (dystocia) have a delayed interval between calving and resumption of estrous cycles, better assistance at calving may help better maintain a yearly calving interval in some herds. However, more post-natal intervention may be required by the producer when calving in a confined space. In a 2001 study, Kjaestad and Simensen reported reduced mothering, dam/calf bonding, and colostrum intake as calving area decreased from pasture, to a calving pen, to a “cubicle”. Moreover, as parturition is viewed by many as an “athletic” event, some producers question if confinement results in less “fit” cows which actually increases the risk of dystocia. This is highly speculative, but a hypothesis that may warrant further research as more cows are maintained in smaller areas for longer stretches of time.

In terms of herd health, a hot topic in regards to confinement is how such a practice may impact calf scour. In a survey conducted by the USDA and Kansas State University (2000), results suggested that calving in confinement was associated with an increased risk of calf sickness. Particularly as calves can contract a multitude of pathogens that cause scours within the first 3 weeks of life, cleanliness of calving facilities is paramount. With this being said, intensive management can often...
prevent a scours outbreak. Frequent cleaning and bedding of the calving area will help minimize pathogen load; however, with high stocking density it can be difficult to clean and bed adequately to maintain a sanitary environment for newborn calves. Separating pairs from pregnant cows can be helpful, but moving pairs from a centralized gestation/calving area can still allow significant pathogen build-up in the gestation/calving area. The Sandhills Calving System (Roybal, 2007) works on the premise that calves born into a “pathogen-free” environment will maintain better health. Thus, cows that have yet to calve are moved to a new pasture/paddock on a weekly basis to avoid pathogen build-up. In a confinement system, this scheme becomes more challenging, but modified Sandhills Systems can be implemented and combined with increased cleaning and bedding to dramatically reduce scour risk.

Finally, as with any confinement setting, foot and leg issues should be considered and measures taken when possible to reduce impact. Cows and calves in confinement should be monitored regularly for footrot, hairy heel warts, and lameness. Because infectious diseases such as respiratory disorders can spread more readily in confined spaces animals should be monitored closely for those conditions as well.

**Feeding**

Perhaps the most attractive component of extended confinement is the ability to better control feed costs and intake. In some instances, managing through confinement fosters a better opportunity to control access to baled forage or implement utilization of a TMR to control feed delivery and reduce waste. Depending on baling and storage method, grinding and feeding forage using a TMR can reduce waste from 25% to as little as 5% (perhaps less). Mixing and grinding machinery may represent an increased equipment cost, but if forage is limited or of poorer quality, grinding and mixing may facilitate the development of more economical rations. While use of a TMR may allow for incorporation of various other cost-effective feeds into the ration, it is important to maintain a forage-base in the diet of at least 0.5% of the cow’s body weight on a dry matter basis to maintain proper rumen health. It should be noted that this minimum proportion of forage in the diet will be at least double the minimum amount of forage in traditional feedlot rations. If designing a new facility, larger bunk or more bunk space may be considered to allow for delivery of increased volume. If using existing bunks, multiple daily feed deliveries may be necessary.

In the scenario that confinement of cattle is completely under roof, at least during the winter months, it is expected that providing a wind break and a more comfortable environment may slightly reduce energy requirements for maintenance. However, more research is needed to fully elucidate how dramatic those alterations in energy requirements may be. In a year-round dry lot scenario, when compared to cows that were allowed to graze for 6 months of the year, Anderson et al. (2013) reported that annual cash (feed) costs for cows in confinement was approximately $62 more than cows allowed on pasture ($519 vs. $457 for drylot confinement and pasture cows, respectively). It should be noted that these figures include pasture rental rates but do not include fixed costs of the facility in the dry lot scenario. However, using partial budgeting, creep feed costs were reduced and adding the value of manure of the drylot cows resulted in a net cost/pair/year of $580 vs $557 for drylot and pasture cows, respectively.

**Economic considerations for equipment and facilities**

Costs per unit and net returns in cow-calf production are highly dependent on production levels. Production levels vary for a number of reasons including quality or genetics of cattle, weather, input levels, and management. As such, any alterations to management should consider changes to expected production levels. For example, altering how cows and calves are managed could lead to varying differences in weaned calf percentages and/or calf weaning weights. These differences could be short-lived or last for a number of years. Considering changes to expected production levels can help producers examine the financial risk that is directly related to production risk of the enterprise. Note, for budgeting purposes, if production levels reflect production variability due to management as opposed to the quality of cattle produced, values should be held constant.

Beef cow herds are capital-intensive enterprises and should be viewed as other capital investments. Like other assets there is an initial investment followed by a stream of future earnings that provides a return on the original investment. The same rationale can follow for an investment in a system to manage beef cows. The decision to make an investment in equipment and/or facilities can be treated as a straight-forward capital budgeting problem. Capital budgeting can help in the planning process by determining if an investment is worth the capital expenditure. Capital requirements for equipment and/or facilities can vary greatly and will warrant considerable attention as an input in this process.

It is well known that production costs for cow-calf producers fluctuate considerably over time and year-to-year swings can be extreme. Some of this variability across time is due to macro-economic factors that producers have limited ability to manage. While producers might not be able to influence overall market conditions, they do have control of costs at the farm-level.
How cows are managed can have an impact, to varying degrees, on operating and fixed costs. Operating costs are the costs associated with actual production and include items such as feed, labor, and utilities. Fixed costs are costs that are incurred after a facility is built or equipment is installed regardless of continued use of a particular facility or piece of equipment. Fixed costs—depreciation, interest, repairs, taxes, and insurance on buildings and equipment — are functions of construction cost and expected useful life. Fixed costs, as a percentage of total costs can vary considerably depending on how facilities and/or equipment are utilized.

Producers assessing the economic situation presented by altering management of their beef cow herd will want to base the analysis on the most likely assumptions. The resulting analysis may then be evaluated in relation to the risks associated with not being able to precisely predict the future. Any investment return is a function of both revenue and costs so consideration of production levels (e.g., weaned calf percentages, calf weaning weights, etc.) and operating and fixed costs corresponding to the lifespan of the investment is needed.

**Conclusion**

The changing landscape of beef production has given way to new managerial considerations for cow-calf producers. Adapting longer periods of confinement to better utilize available forage resources and control feed costs may be an economically viable opportunity for producers. However, inherent risks associated with herd health and proper space must be keenly addressed to ensure potential gains in feed expenditures are not offset due to other production measures. Ultimately, producers are encouraged to evaluate all opportunities as the best scenario will be highly individualized and dependent on multiple factors.

**References**

