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**109 Mature cow size and impacts on cow efficiency.**

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According to genetic trend data, mature BW in beef cows continues to increase although the pace is slowing. This change is not increased frame size as the genetic trend for mature height in Angus cattle has been flat since about 1995. In sell-at-weaning enterprises, calf value at weaning must accompany increased cow size to justify the added expense of larger cows. We used the California Net Energy System and NASEM (2016) equations to estimate the annual cost to maintain beef cows varying in mature size. Maintenance energy requirements were assumed to be 77 kcal per kg of metabolic body weight plus 20% during lactation. Reproductive efficiency and average daily milk production was assumed to be equal among the two mature cow BW scenarios. In ranching operations with average mature cow BW of 556 kg and annual feed and grazing costs of \$400, \$500, \$600 or \$700, increasing average mature BW by 90.8 kg resulted in increased projected annual feed and grazing cost of \$41.05, \$51.32, \$61.58 and \$71.84 per cow, respectively, or about 10%. Estimated differences in variable costs (labor, depreciation, etc.) were minor for the larger cow herd. Assuming an annual replacement rate of 16% and cull cow price of \$1.32 per kg, cull cow income would increase by approximately \$19.20 per cow per year in the larger cow scenario. Consequently, to break even with the 556 kg mature cow BW scenario, sell-at-weaning enterprises with average mature cow BW of 647 kg must achieve \$21.85, \$32.12, \$42.38, or \$52.64 increased calf value depending on average annual cow cost. These estimates of increased income required to offset increased mature cow BW are conservative because no cost was assigned to grow the additional 90.8 kg of cow BW.

**Key words:** beef cows, efficiency, cost

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**NONRUMINANT NUTRITION SYMPOSIUM: NURSERY PIG NUTRITION AND HEALTH**

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**111 Common nutritional and infectious health challenges in nursery pigs.** Eric R. Burrough, Nicholas K. Gabler, *Iowa State University*

Poor starting nursery pigs are a common source of frustration for pork producers due to suboptimal lean tissue production and failure to thrive. This is generally a multifactorial issue with potential nutritional, infectious and management contributors. Commonly encountered respiratory and enteric pathogens include porcine reproductive and respiratory syndrome virus (PRRSV), influenza A virus (IAV), porcine enteric coronaviruses (TGEV/PEDV/PDCV), and group A, B, and C rotaviruses, as well as *Salmonella typhimurium*, enterotoxigenic *Escherichia coli*, *Streptococcus suis*, and *Haemophilus parasuis*. Infection with one or more of these agents can ultimately antagonize pig health and performance. However, while these specific pathogens may be causing an observed disease symptom, pigs may have been predisposed to infection due to various management, nutritional, and environmental risk factors. As many of these potential pathogens are endemic in production systems, it is important to remember that simply detecting a potential pathogen within a population is often not sufficient to assign cause for poor growth and production. To help fully interpret the impact of a detected agent, diagnostic efforts should focus on providing proof that the agent is actually causing disease. Molecular detection methods, such as PCR, are increasingly available for common pathogens and have high diagnostic sensitivity but lower diagnostic specificity. This paper will discuss the clinical signs and gross and microscopic lesions associated with common nursery pig pathogens, as well as proper sampling and diagnostic testing necessary to detect and confirm disease following infection with these agents.

**Key words:** nursery, nutritional, infectious