National Research Council. ***Nutrient Requirements of Beef Cattle, 7th ed.*** National Academy Press, Washington, 1996. 242pp. ISBN 0-30-05426-5. $29.95 US.

The long awaited 7th revised edition of the Nutrient Requirements of Beef Cattle was released this past summer by the National Research Council (NRC). It is not a revelation of new information, but rather a fine tuning of previous recommendations. Summaries of research for each nutrient provide an excellent review of all the nutrients pertinent to beef nutrition. The factorial approach to calculating energy and protein requirements has been replaced with dynamic models that account for rumen interactions and differences among a wider range of cattle types and sizes. The increased complexity has been simplified with all relevant equations compiled into a computer program. A section demonstrating proper application, using an actual feedlot and ranch case study, helps clarify proper use.

The 1984 NRC energy equation for a medium-framed steer calf is the foundation upon which energy requirements are calculated for all cattle types. Differences in frame size are then accounted for by adjusting cattle weights to an equivalent shrunk body weight, or a weight proportional to a medium-framed steer calf with an equivalent amount of body fat. Multipliers are given to account for a wide range of factors influencing maintenance energy requirements. Adjustments for energy requirements based on desired changes in body condition simplify ration balancing for the cow herd.

Changes in expressing protein requirements are the most notable change in the revised NRC publication. Degradable and undegradable fractions of feed proteins are distinguished, and estimates of microbial protein production provide a basis for the degradable protein requirement. Need for bypass protein is calculated, based on the difference between the metabolizable protein requirement and the sum of microbial protein and feed protein reaching the small intestine.

Mineral requirements are now distinguished for breeding cattle and growing and finishing cattle, with higher requirements suggested for magnesium, potassium, sodium, and manganese for breeding females. The suggested phosphorus requirement has gone down moderately, and the manganese requirement is only half as high for growing cattle as for breeding stock.

In a section on water and vitamin nutrition, water requirements are estimated, based on live weight, ambient temperature, and physiological function. Suggested requirements for fat soluble vitamins have changed very little, and possible situations where supplemental B vitamins may be beneficial are reviewed.

A new section addressing the effects of stress on nutrient requirements indicates that other than elevated potassium levels to compensate for electrolyte losses, the primary nutritional adjustment for stressed cattle is simply an adjustment in nutrient concentration to accommodate lower intakes. Nutrients potentially enhancing immunity are discussed.

Feed composition tables now include "number of samples" and "standard deviations" for each nutrient analyzed for most feeds. Information is also given on the effects of processing on nutritive value.

The revised NRC publication provides 2 different levels or models, each with a unique set of equations accounting for digestive processes and calculating requirements. The 1st level is recommended for establishing nutrient requirements and is based primarily on the 1984 NRC equations, except where there is sufficient information to justify a change. The 2nd level is a derivative of the Cornell Net Carbohydrate and Protein System and is recommended as a diagnostic and learning tool. Discrepancies between the 2 levels are a bit confusing and a reminder that our understanding of beef nutrition is not conclusive.

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