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Note: This is an excerpt from the 2009 Bison Producers' Handbook.

Bison feed intake varies, to some degree, with season of the year. In general, bison have more robust appetites in the spring (after winter mini-hibernation) and again in the fall (in preparation for winter). This remnant of survivalist behavior is more pronounced in regions with cold, snow, and short day length. In North Dakota State University (NDSU) studies, bison gained 1.72, 1.30, 1.76, and .37 pounds, respectively, during 3-month periods of spring, summer, fall, and winter. In another trial, respective seasonal gains were 1.32, 1.85, 1.94, and .99 pounds/head/day.

It may be possible to mitigate seasonal variation by offering high quality diets throughout the year. Lighting of feedyards may also mitigate reduced winter intake, but this concept has not been tested. Compensatory gains from offering high-energy feeds during periods of greater seasonal intake may improve bison performance for short periods of time. Getting bison to market weight during these windows of excellent feed intake and gain should increase overall efficiency. Finishing bison during the heat of the summer or during severe winters is difficult. Feed intake is usually depressed and maintenance requirements are greater. As a result, carcass quality traits vary considerably for animals marketed during these times of the year. The challenge to producers is to provide uniform size and quality of animals to terminal markets throughout the year.

There is no “best” answer for feeding strategies for bison calves from weaning to market. Some direct comparisons on forage feeding/grazing/grain feeding have been made with cooperating producers. Different combinations of grazing and forage or grain feeding produced surprisingly similar results. In one study we compared: 1) feeding calves a high-grain diet from weaning until market (more than 1 year on feed); 2) wintering weaned bison calves on forage, then full grain feeding in the spring until slaughter; 3) wintering calves on forage, grazing the following summer and fed grain in the fall until market, or 4) wintering on forage, summer grazing, wintering on forage again, and then grain fed until slaughter. The number of days on feed for the respective treatments, (488, 473, 492, and 502, was surprisingly similar. Gross returns were greatest for treatment 1 followed by treatment 3 and lowest for treatment 4 due primarily to carcass quality factors. Higher grain prices now should favor shorter grain feeding periods but forage and pasture costs have risen also. These scenarios need more research to determine optimum performance and return under varying input costs and current bison carcass values.

In a second study, weaned bison calves were fed low quality forage (mature native grass hay) with no supplement, or 2, 4, or 6 pounds of energy/protein concentrate. Calves fed only low quality forage lost weight and never did achieve equal growth and carcass quality of the other treatments. As little as 2 pounds of supplement will keep calves gaining by improving forage digestibility and improve subsequent gains in the feed yard.

Good to excellent quality forage may also support acceptable winter gains for newly weaned calves.

Feeding systems affect labor requirements, facility design, and equipment needs. Several observations indicate that self-feeding a homogenous concentrate (pellet or mixed grains), with free-choice hay offered separately, supports an equal or better growth rate compared with daily feeding of a totally-mixed ration in a fence-line feed bunk. We also tested an automatic feeder that delivered grain to the bunk at several preselected times per day in an effort to increase bunk visits, however, there was no benefit to feed intake or gain. There is risk in allowing any self-feeder to be empty for more than an hour or two. Subsequent gorging can potentially cause acidosis, bloat, and death. Self-feeders should allow 4 to 6 inches per head and be designed to eliminate blind spots so bison at the feeder are not ambushed from the side by dominant animals. Frequent inspection of the trough and cleaning of fines will encourage greater intake.

Totally mixed rations delivered to fence-line bunks are the norm in commercial feedlots, but require economies of scale to be successful. Commercial feeders require a minimum of 3,000 to 5,000 head to be economically viable unless the feed yard is associated with a farm that produces feed grains, forages, and has labor available.

A new concept that some producer testing proved to be worthwhile is field feeding, which involves offering grain in self-feeders to bison that are grazing modest-sized tracts of grass. The feeders should be movable and careful attention paid to the grass stand or significant damage could occur due to overgrazing. This management practice would eliminate the need for any runoff containment structures. Supplementing grazing bison with high energy/protein range cake would be a variation of the field feeding but requires daily or alternate-day feed deliver.

Impact of Social Structure

It is nearly impossible to market a uniform pen of bison that have been on feed three months or more due to differences in individual animal performance, mature size, and to some extent, social behavior. Sorting feeder bison into uniform groups when they enter a pen is recommended but there is still significant variation in end weights. Confounding this is the challenge of topping pens, sorting the heaviest animals for market, a disruptive event for handlers and bison alike. Removing the larger bison from a pen, generally the dominant animals, causes disruption in the social order and reduced feed intake by the entire group for multiple days (Dr. Bruce Rutley, personal communication). The alternative is to simply market all the animals at the same time in a pen, but pen size and animal numbers vary dramatically from producer to producer. Similarly, adding new animals to a pen that has an established pecking order disrupts feed intake. Combining similar numbers of animals can be more chaotic than adding one or two to a larger group. Feeding heifers and bulls together is not recommended, especially with yearlings and older animals. Wintering mixed sexes of calves is possible, since in many cases, these animals are herd mates and have established a social stratum already, and have not

attained puberty.

Facilities

Following are some general observations on pen space per animal and number of animals per pen. Producer experiences are solicited to refine these recommendations. Bison are more active than other species, frequently moving around the pens in the mornings and evenings. A minimum of 250 square feet per head for feeder animals is recommended, preferably, 400 sq feet, especially if the pens are not well drained and cleaned periodically. Bunk space for fence-line feeding for horned animals should be at least 2 feet, but dehorned animals may require only one foot. Fences should be solidly built and tall enough to prevent jumping, with 64-66 inches recommended. Crowding areas should be even more solidly built with 72-inch fences.

Bison will typically not challenge what they cannot see through so solid gates with canvas, plywood, or steel covered panels can help retard these challenges. Heavy bow gates, with an overhead frame, are generally more durable and longer lasting. Working facilities can be problematic for flow of bison. They need to be built solidly, with minimum noise during use, and operated by a minimum number of herdsman. New concepts in low-stress handling may be useful for planning new facilities for both feedlots and cow/calf operations.