

# Critique of Bison Exp 1 and Bison Exp 2&3

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Two articles on feeding bison (Bison Exp 1 and Bison Exp. 2&3) are located in the Publications folder. I'd like to discuss a few observations I made about these articles.

The articles exemplify one of my pet peeves about research studies. Scientists often recommend specific practices; in this case what to feed bison based on average daily gains (ADG) or improved feed efficiency (FE) but they rarely address cost of gain. The authors do include cost of gain in Exp.1 but completely ignore it in Exp. 2&3.

## **Evidence for ability to mix diets**

In Exp. 1 pelleted rations were similar in nutritive value, only differing in the main ingredient in the rations. Total intake and intake of pellets and hay were similar for all rations, indicating that bison are capable of mixing their diets to meet nutritional needs. The primary difference among rations was ADG. ADG was highest for screenings and lowest for crambe meal, while the other diets did not differ from either crambe meal or screenings. One would expect performance to be similar on all rations since nutritive value of rations was similar.

## **Cost per pound of gain matters**

The biggest difference between rations was cost of gain (\$/lb), which was \$0.54 screenings, \$0.73 for wheat midds and crambe meal and \$0.89 for the commercial diet. Many feeding studies look at performance only in terms of ADG and FE. However, without going one step further and looking at cost of gain, producers have an incomplete picture of the value of feeds and feed ingredients in finishing bison.

## **Is feeding more energy really better?**

In Exp 2, bison had higher intakes, ADG and better FE when fed rolled corn rather than screenings. However, the differences were not significant which means there were no differences. That's why we use statistics, to find the differences. The conclusion from this study might be that corn is superior to screenings, which is true in terms of energy per pound of feed. However, without an economic analysis, it's impossible to know which feed is the most economical in terms of cost per pound of gain.

Bison had similar intakes, FE and ADG on all rations in Exp 1 and rolled corn rations in Exp. 2 but performance on screenings in Exp. 2 was much lower than in Exp. 1. While it's uncommon to compare data from two different studies, the same scientists conducted these studies at the same facility a year apart. Also, the nutritional values of screenings were similar between years. The primary

difference between the studies was bison were about 100 lbs heavier in Exp. 2 than Exp. 1. Why are differences in bison performance on screenings so large in Exp. 1 vs. 2? Authors do not address this question but they do recommend feeding higher levels of energy to bison.

Food processing was confounded with the amount of corn in the diet in Exp. 2. The screenings diet in Exp. 2 was complete pelleted ration while bison fed corn were fed 75% corn and 25% pelleted screenings separately. Thus, the poor performance of the screenings diet could be due in part to extra food processing (grinding and pelleting of corn) in the screenings rations.

So what's my point? The authors recommend that feeding diets higher energy to bison. However, the only way to guarantee bison will consume more energy is to feed a Total Mixed Ration (TMR) or limit the amount of hay fed. Yet their experiment, in my mind, is not conclusive as to the benefit of feeding higher energy nor do they provide any economic information in Exp. 2.

### **Are TMR's better?**

In Exp. 3, the TMR is touted as superior in terms of FE but this result is confounded because researchers did not account for hay wastage. Bison on the TMR had lower intakes but ate more grain than the other groups. Increased consumption of grain should have led to higher ADG but it did not. Also, bison on the TMR ate half the amount of hay compare to groups given a choice between hay and concentrate. It appears that the TMR was too high in grain since animals with a choice ate less grain and more hay, yet had similar ADG. Again, with no economic analysis it's difficult to determine which feeding method was economically superior.