

I'm New Here, What's Good to Eat?: Naive Cattle and New Forages

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SUMMARY

Naive animals (those not familiar with new circumstances) frequently have a difficult time coping in new environments. Forage selection and grazing behavior of naive and experienced steers were compared in experimental pastures on the Northern Great Basin Experimental Range near Burns, Oregon, in 1994. Experienced steers immediately began the trials grazing preferred forages (crested wheatgrass and basin wild rye) while naive steers sampled a greater variety of forages the first day. Throughout the 4-day trial, naive steers selected forage from the preferred grasses 69 percent of the time and the experienced steers 90 percent of time. Naive steers were more likely to take a single bite of a plant even though they spent more time at each feeding station than experienced steers. Experienced steers selected the closest plant about 51 percent of the time, and naive steers grazed the closest plant only about 32 percent of the time. As a result, naive steers traveled about 42 percent further than their experienced counterparts. These findings suggest that naive cattle may be at a nutritional disadvantage when they first enter a new environment, and it is suggested they be supplemented with some familiar forages when being shifted to new areas to compensate for their lack of nutritional experience. Animal gains may be less than expected due to greater energy expenditure for travel, especially if they are in rough terrain.

INTRODUCTION

Any animal that is moved to a new environment is typically at a disadvantage, and at first can not make efficient use of the resources on hand. Transplanting, particularly of our smaller wildlife species, frequently results in the deaths of many of the new arrivals. Larger animals, because they have more stored fats or body reserves, have a better chance of surviving transplants than their smaller cousins because they range over a larger area and have more time to learn where food, water, or cover might be located. Among livestock, naive animals are also more likely to eat poisonous plants than animals that are familiar with their forages. This is especially true of animals that are hungry after an extended trip. In general, we also find that transplanted livestock do not grow or gain weight as rapidly as animals that are experienced with the same pastures. While this has been widely noted, there have been few investigations that addressed exactly why newcomers do not fare as well as experienced animals. With these observations in mind, we designed an experiment to compare forage selection, grazing behavior, and nutrient intake by naive and experienced cattle. Our specific questions were: 1) Do naive and experienced cattle select the same forages? 2) If selection is different, do their diets become more similar as time passes? 3) Do naive cattle expend more or less effort in their foraging activities?

METHODS

Six yearling steers were used in the project. In their first year they grazed as calves on tall fescue pastures at the Union Experiment Station. At 6 months, all were transported to the Eastern Oregon Agricultural Research Center, Burns, where they wintered on flood meadow pastures and native hay. All were tamed so they could be easily captured and observed without undue disturbance to their behavior. One week before our trials, three of the steers were trucked to the Northern Great Basin Experimental Range and released to forage at will on native sagebrush/bunchgrass range. These animals are subsequently referred to as "experienced" animals while the steers remaining on the flood meadows are classified as "naive."

Seven days later the naive steers were trucked to the Experimental Range and maintained overnight on meadow hay. All steers were gathered the next morning and each animal was released into an experimental pasture supporting 800 forage plants. The 800 plants included 8 different types of grasses with 100 plants of each species available. Plants had been established in previous years, and were approximately 3 feet apart. Before our trials, samples of each grass were gathered for later analysis of forage quality and production. Forages included: bluebunch wheatgrass, Idaho fescue, squirreltail, needle and thread grass, Sandberg's bluegrass, Thurber's needlegrass, crested wheatgrass, and basin wild rye.

As each animal was released, we followed with a portable computer to keep track of the number of bites taken from each plant and the amount of time that elapsed between the first and last bite at each feeding station. We were also able to record how far each steer traveled as it foraged. Each animal was followed as it grazed on a total of 100 plants, which typically took about 40 minutes per steer. Trials were conducted over a 4-day period, and steers were kept in corrals and fed meadow hay each night.

RESULTS

Previous work at the Station has shown that crested wheatgrass and basin wild rye were preferred forages of cattle when grasses were green and growing. Our experienced steers entered their pastures and immediately began grazing on these two forages. Over the first day of grazing, roughly 90 percent of their visits were to these two species (Figure 1). The naive steers, however, began their first day with some exploratory grazing among the grasses. By the time they had foraged on 25 plants, roughly 60 percent of their diet was taken from crested wheatgrass and basin wild rye. By the end of the first grazing session or day, this increased to roughly 73 percent. Over all 4 days the experienced steers averaged 90 percent of their visits to the preferred forages, while the naive animals averaged only 69 percent. Both the naive and experienced steers appeared to go through a brief period (five to ten plants) of sampling the forages each morning as they began foraging (Figure 1). Quickly, however, they appeared to settle into selecting the preferred grasses at a relatively uniform rate.

Other aspects of the naive steer's grazing behavior suggested that they were not foraging as efficiently as their experienced counterparts. On average, an experienced steer harvested a total of 960 bites from crested wheatgrass and basin wild rye, while the naive

animals averaged 690 total bites each day. Naive steers were also more likely to take single bites from plants than experienced animals. Thirty-seven percent of the time the naive steers removed only one bite from a plant before searching for another, while the experienced animals exhibited this behavior only 20 percent of the time. Also, the naive steers averaged about 8 seconds at each plant while the experienced cattle averaged only 5.5 seconds. This suggested that the naive steers spent more time handling forages than the experienced steers. The experienced steers harvested about 46 bites per minute, while the naive animals averaged 39. These two values are close enough, however, that we can not really say there was a significant difference between treatments.

The distances traveled by the steers also implied that the naive animals were less efficient foragers. Naive steers traveled about 318 yards during each grazing session while the experienced steers ranged over only 223 yards. Typically, the experienced steers traveled about 1.8 yards between feeding stations and the naive animals about 2.5 yards. All of these findings suggest that naive cattle are indeed less efficient foragers than experienced cattle. The naive animals make fewer visits to, and take fewer bites from, preferred forages. Conversely, they take more bites from the less, preferred forages than the experienced cattle. Overall, naive animals spent more time at each feeding station, but harvested fewer bites. They were less likely to seek out the closest plant to graze, and traveled further as they grazed. Our forage analyses are not yet completed, so we can not address the nutritional status of our treatments at this printing. We speculate, however, that the diet quality of naive steers was slightly lower than that of experienced animals.

Finally, we were not able to address the question of how long it takes for a naive animal to become an experienced individual. By the end of the fourth day the preferred forages in our experimental pastures were becoming depleted, so the selective opportunity of the cattle was diminished. This being the case, their diets would be forced to converge as time passed, so the trials were terminated. While a period of seven to fourteen days is frequently heard in discussions, no definitive research has addressed this question. In some instances, livestock shift readily to a new food or forage, and at other times palatable and nutritious rations may not be recognized as food for up to 30 days.

If livestock are transported to new environments or rations are to be shifted dramatically, a "soft transfer" is suggested. This could be accomplished by gradually introducing the novel foods to the animal in a familiar environment or furnishing familiar forages to the animal for a brief adjustment period in the novel environment. In either case the nutritional shock that occurs in the transfer would be moderated to some degree. If possible, calves destined to become replacement heifers should gain experience on the same types of ranges they will use as adults.

Figure 1. The percent of visits to preferred forages (crested wheatgrass and basin wild rye) by naive (-----) and experienced (—) steers grazing among eight forages in pastures on the Northern Great Basin Experimental Range in 1994 over a four day period.

