FINAL REPORT

PREFERENCE AND USE OF NUTRA DEER™ PRO ANTLER DEER PELLETS VERSUS TWO OF THE BEST SELLING NATIONAL BRANDS, JULY-AUGUST, 2011

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Introduction

During June, 2011 we were contacted by Mr. Jeff Williams, owner of **Nutra Deer™, Inc.** Mr. Williams requested an independent study of his recently developed deer pelleted ration, Pro Antler 20% Deer Pellets. The purpose of the study would be to determine if his new deer feed, 1) was highly attractive to deer, 2) was indeed nutritiously sound, and 3) competed favorably with the two most popular national brands.

We often are contacted by companies requesting similar independent testing of their product(s), as an internationally recognized white-tailed deer research facility. Before we agree to conduct any study on a product or service, we demand the following conditional terms:

1. This will be an <u>independent</u> study without influence from the manufacturer or service provider.

2. The product or service must withstand true scientific scrutiny, with strict adherence to the scientific method.

3. The results of the study are what they are, and cannot be changed or presented by the contractor in any other light than the factual information developed.

4. Finally, we agree to complete confidentiality of results and the contractor has complete control of revelations about the results of the testing. Any publicity or information revealed to the public, including a copy of this report, is at the discretion of the contractor.

5. However, no information can be altered in any way to provide a better light to the product or service; viz., the results are the results, pure and simple.

The next step was to develop a research protocol which would reduce or eliminate as much bias in the tests. The methods discussed below capture this philosophy. We chose two products against which to test the attractiveness of Pro Antler 20%; against BRAND A and BRAND Z. (Both of the leading national brands are advertised to be highly attractive to deer and elk).

We also examined the proprietary formula for Nutra Deer: Pro Antler to determine the appropriateness of the formulation for free-ranging whitetails, based on our experience and published information concerning the nutritional requirements of this species.

Finally, we present our conclusions in regard to the findings, our professional opinions about the feed; and, present recommendations about marketing the product.

Methods

A deer feed preference and use study was initiated on the White-tailed Deer Breeding and Nutrition Research Center near Nacogdoches, TX on July 18, 2011. Two replications of three identical Boss Buck 600# Dr. Deer series gravity feeders (Boss Buck, Seagoville, TX) were established. Feeders were placed in areas known to have open access by deer and were placed with a 30-60 yard space between feeders to allow animals to make choices in visitations to individual feeders. All deer were previously accustomed to utilizing this particular style of pellet feeder. All deer were free-ranging within the confines of the high-fenced Research Center pastures and had open access to native vegetation in addition to the feed supplements used in the study.

One replicate of feeders was established in the Old Pasture that had a density of approximately 1 deer/4 acres and buck:doe ratio of approximately 2:1. The second replicate was established in the Dalmont Pasture that had a density of approximately 1 deer/2 acre and a buck:doe ratio of approximately 4:1. Feed types were assigned randomly to feeders once feeder locations were established. Feed types included Pro Antler 20% protein deer feed (Nutra Deer, Grove, OK), and the leading national feed brands classified for this study as feed brands (A) and (Z).

One infrared trail camera (Cuddeback Attack IR, Cuddeback Digital, De Pere, WI) was placed at each feeder to monitor visitation rate and length of time animals spent at each feeder. For the first two weeks of the study, cameras were set to record a 30 second video along with the initial photograph upon activation by an animal. For the second two week period only still photographs were used. For each photograph or video record the sex and estimated age of each animal feeding was recorded. For the video portion of the study the length of each feeding bout by each animal was recorded. Sex and age classes of animals recorded were adult doe, fawn, yearling male, 2-3 year old male and males estimated ≥4 years old.

In addition to visitation rates determined by the cameras, amount of feed consumed by deer during each two week period was recorded. An identical amount of feed was placed in each feeder at the beginning of the study. Feed was added on an as needed basis to prevent feeders from becoming empty. At the end of the first two weeks, feed from each feeder was removed and weighed. The difference between the amount of feed placed in each feeder and the amount remaining at the end of the two week period was considered the amount of feed consumed by deer. The remaining feed was returned to the feeder of origin. Additional feed was added on an as needed basis to prevent the feeders from becoming empty for the next two week period when the feed was again removed and weighed. Amount of feed consumed was calculated as above. A small amount of feed was spilled on the ground by deer and may have been consumed by non-target animals such as raccoons, squirrels or birds. We assumed an equal amount of spillage for each feed. We had no photographic record of any animals other than deer feeding directly from any feeder.

Results

There were 3 parts to this study. First, it is our considerable experience white-tailed deer are relatively slow to adopt new feeds, or even new feeders. In most cases, on average deer take

10-14 days to become accustomed to either feed or feeders. Hence, the four week study period was selected to test this observation. Second, a deer feed should be tested both for attractiveness and the amount eaten during the study period. Third, the actual composition of the feed and guaranteed nutritional analysis must be considered.

Attractiveness

Deer tended to investigate all feeders within a day of deployment of feeders and there appeared to be no bias in regard to position of each feeder.

The study was begun on 8 July, 2011, at which time all 6 feeders were placed and filled with feed, randomly assigned as given above. The time to first actual feeding was determined from the trail camera photographs, are were as follows:

ProAntler

Old Pasture	8 July, 2011	7:55 pm
Dalmont Pasture	9 July, 2011	5:43 am

Brand Z

Old Pasture	8 July, 2011	7:27 pm
Dalmont Pasture	9 July, 2011	1:00 am

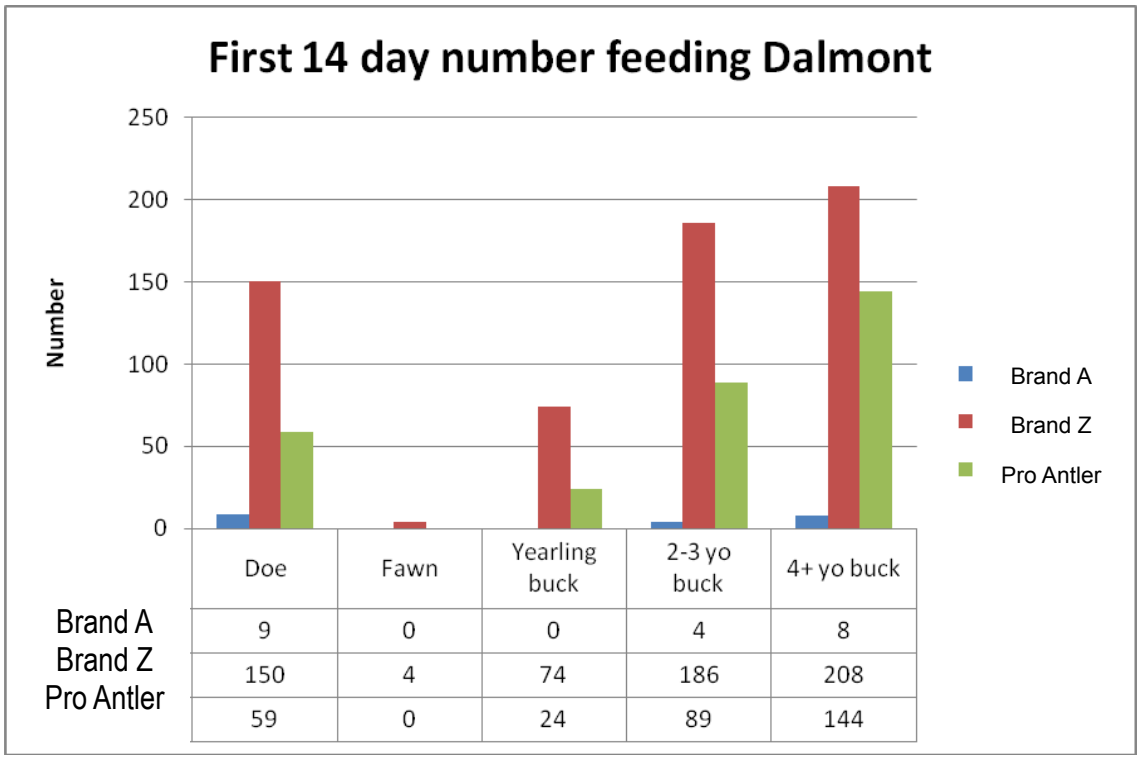
Brand A

Old Pasture	9 July, 2011	5:39 am
Dalmont	9 July, 2011	7:29 am

These dates and times are for the first recorded visitation and do not necessarily indicate actual feeding. There are no real conclusions to be draw at this point, other than the striking tendency for deer coming to Brand A feeders early on to not appear to be very interested in feeding. This will manifest itself later as we examine the use data. The most important conclusion at this point is the Boss Buck Feeders were equally attractive and did not seem to interfere with feeding opportunities.

Feeding Activity

We divided the 30-day test period into two 14-day segments to allow for the bias of a possible acclimation period to the new feeders. Figures 1&2 present the results for the Dalmont Pasture and Old Pasture. Since there could be demographic differences in feeding activity, we divided deer visting the feeders into does, fawns, yearling bucks, immature bucks (2-3 year olds) and



	Doe	Fawn	Yearling buck	2-3 yo buck	4+ yo buck
Brand A	9	0	0	4	8
Brand Z	150	4	74	186	208
Pro Antler	59	0	24	89	144

Figure 1. Feeding activity at the Dalmont Pasture feeders during the first 14 days of the study.

mature bucks (4+ years). At the Dalmont Pasture site, there were very few deer of any age or sex visiting the Brand A feeder (Fig. 1). Further, there were about twice as many does, yearling bucks, In fact, total visits during the two week period were only 21 animal-visits, compared to 622 for Brand Z and 316 for Pro Antler. Looking at the same data for the Old Pasture (Fig. 2), the pattern is somewhat different. First, there were only two visitations to the Brand A feeder

(does); yet does dominated the use of the Pro Antler feeder. Total visitations

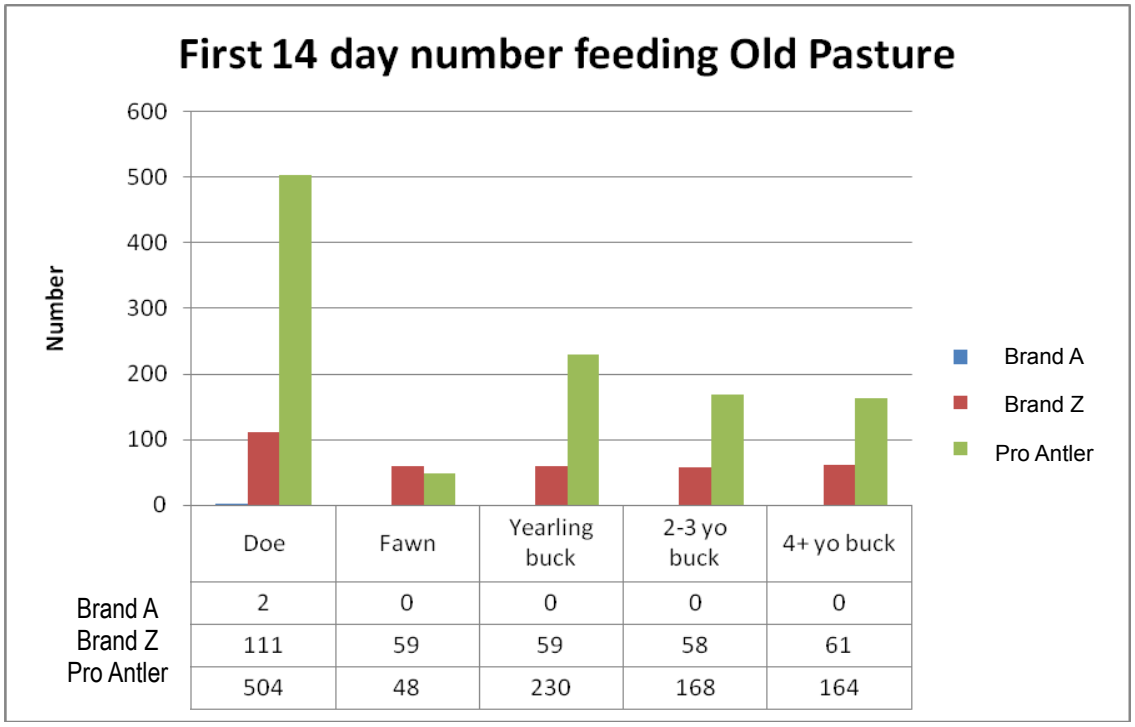
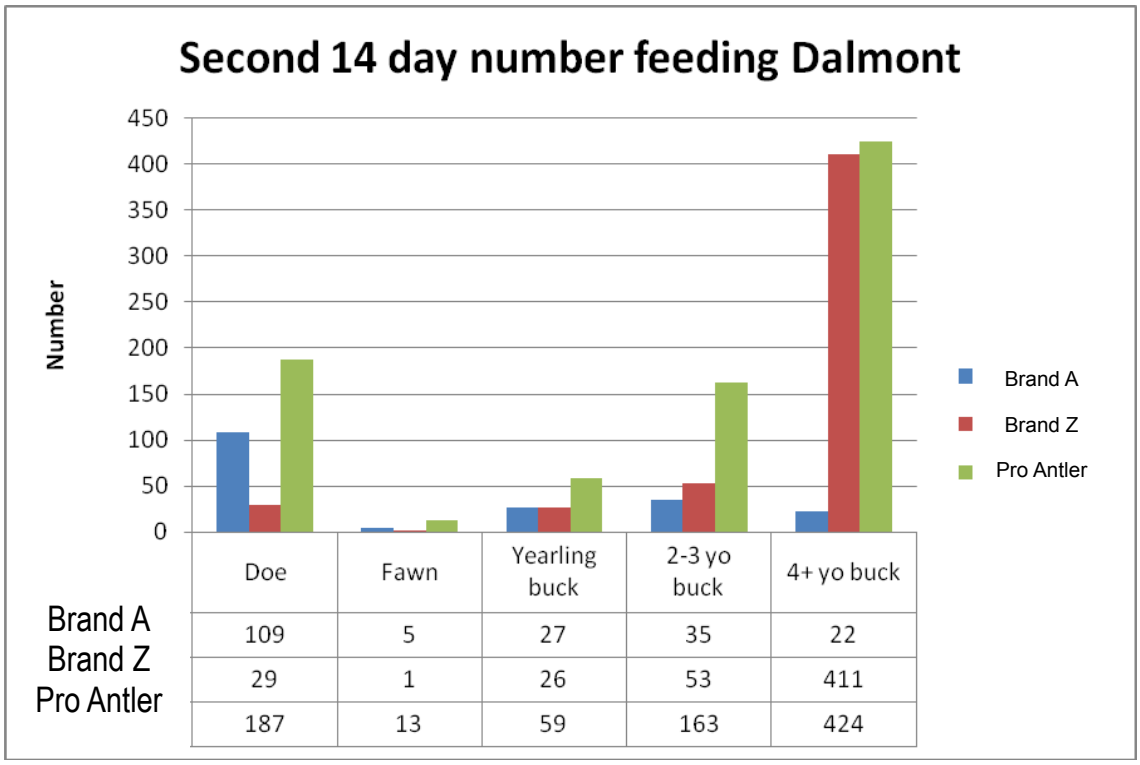


Figure 2. Feeding activity at the Old Pasture feeders during the first 14 days of the study.

for all deer were 2 (Brand A), 348 (Brand Z) and 1,114 (Pro Antler). There was a significant preference by all demographic categories for Pro Antler. Figures 3&4 present the same analysis for the second two week period. Number of visitations for the Dalmont Pasture are different for this period. In all cases, the Pro Antler feed station received the most visits, but number of visits by mature bucks was a virtual "dead heat" between Brand Z and Pro Antler. This period saw an increase in Brand A use, especially for does (Fig. 3) for the Dalmont Pasture, suggesting it took longer for deer to accommodate to this feed. Total visitations were: 198 (Brand A), 411 (Brand Z) and 424 (Pro Antler), respectively.

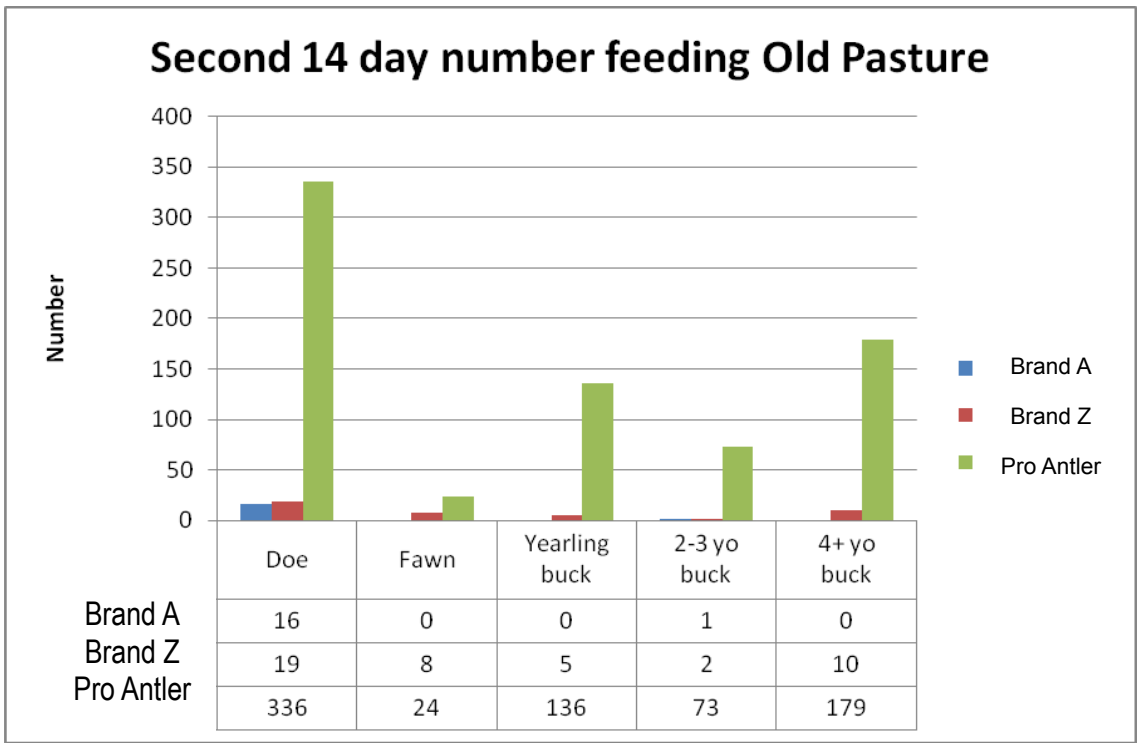
Again, results for the Old Pasture were strikingly different (Fig. 4). Brand Z remained virtually unused, while Pro Antler visitations were significantly higher. We will discuss possible reasons for these differences later. Total visitations for the three feeds were: 17 (Brand A), 44 (Brand Z) and 748 (Pro Antler), respectively.

When we examine the total numbers of visits during the entire four week sample period (Figs. 5&6), there were two distinctly different results. In Figure 5, for Dalmont Pasture does fed more



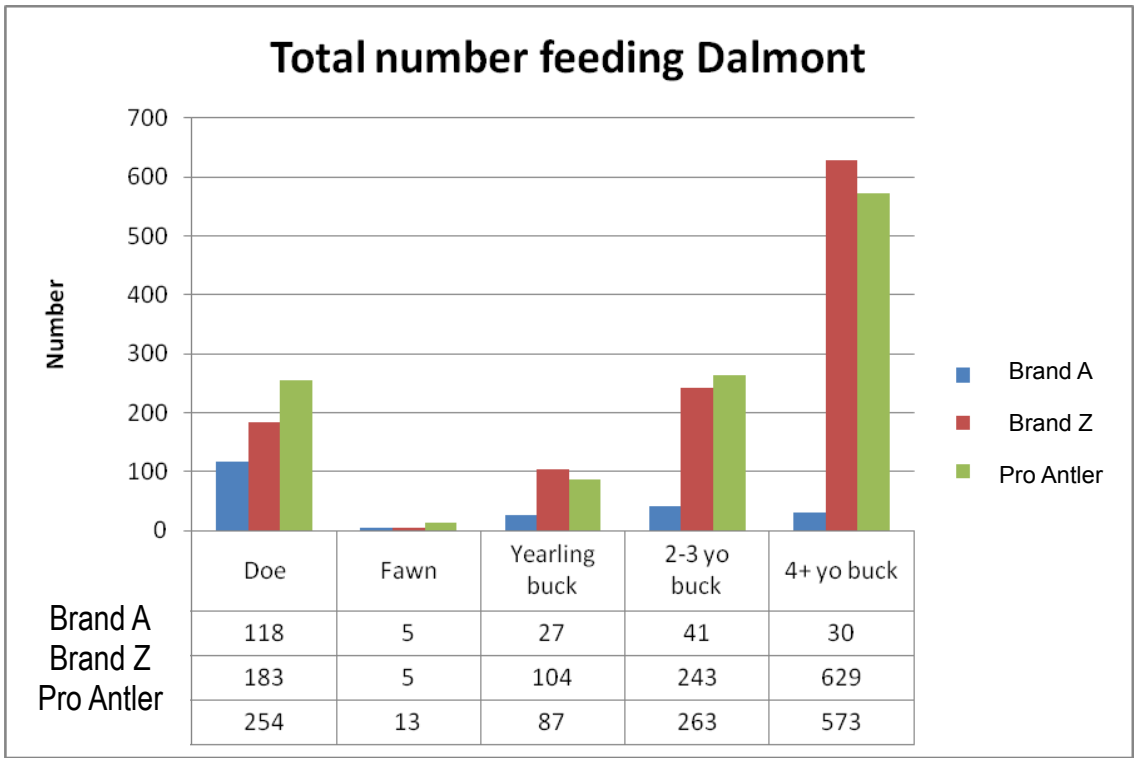
	Doe	Fawn	Yearling buck	2-3 yo buck	4+ yo buck
Brand A	109	5	27	35	22
Brand Z	29	1	26	53	411
Pro Antler	187	13	59	163	424

Figure 3. Feeding activity at the Dalmont Pasture feeders during the second 14 days of the study.



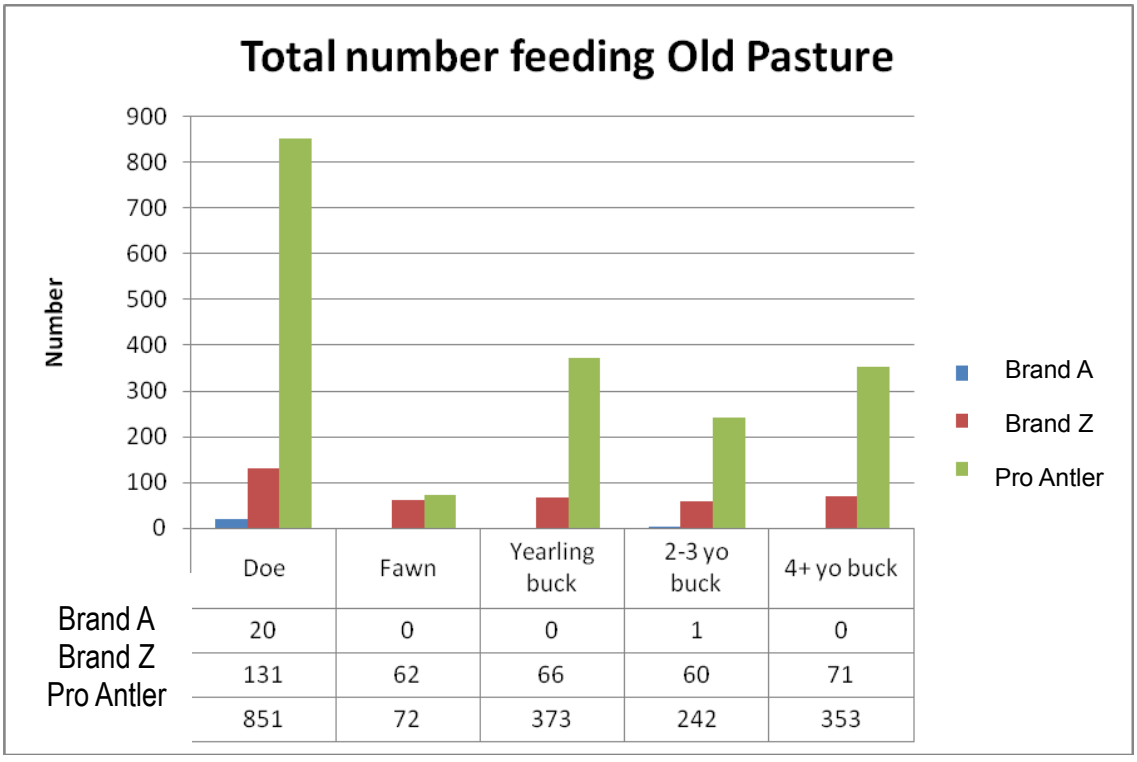
	Doe	Fawn	Yearling buck	2-3 yo buck	4+ yo buck
Brand A	16	0	0	1	0
Brand Z	19	8	5	2	10
Pro Antler	336	24	136	73	179

Figure 4. Feeding activity at the Old Pasture feeders during the second 14 days of the study.



	Doe	Fawn	Yearling buck	2-3 yo buck	4+ yo buck
Brand A	118	5	27	41	30
Brand Z	183	5	104	243	629
Pro Antler	254	13	87	263	573

Figure 5. Total visitations by deer for the three feed types at the Dalmont study area.



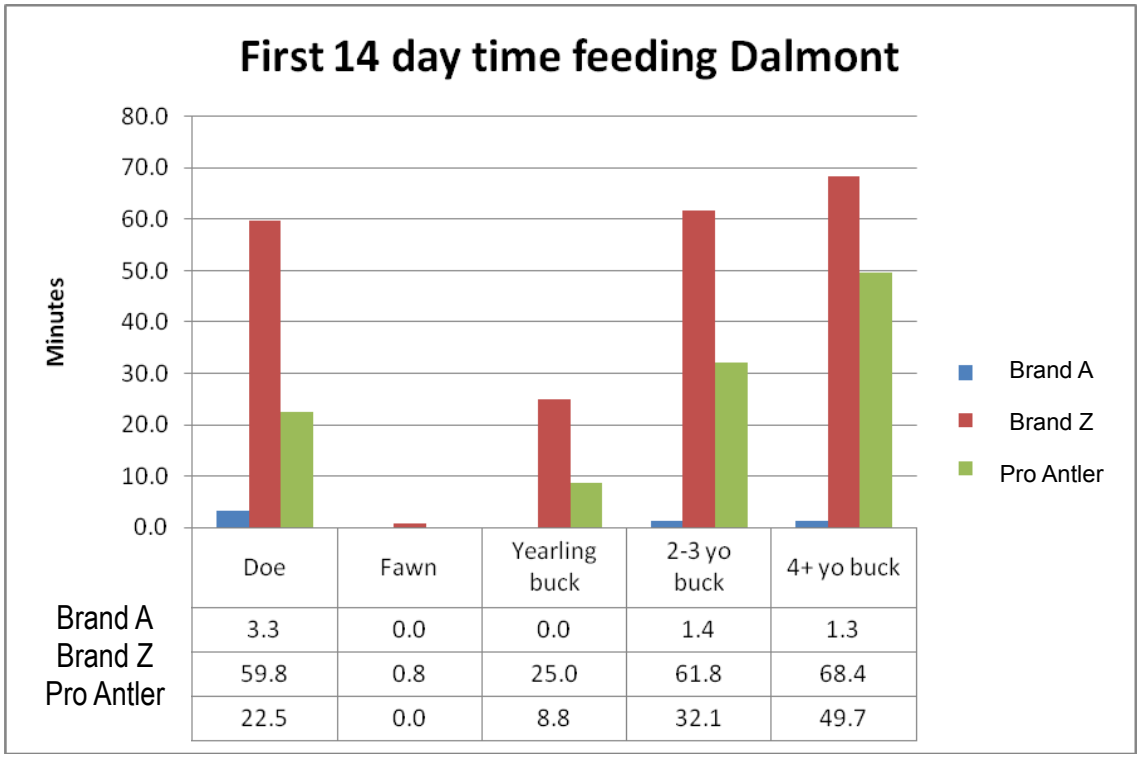
	Doe	Fawn	Yearling buck	2-3 yo buck	4+ yo buck
Brand A	20	0	0	1	0
Brand Z	131	62	66	60	71
Pro Antler	851	72	373	242	353

Figure 6. Total visitations by deer for the three feed types at the Old Pasture.

often at the Pro Antler feeder, but the remaining four demographic groups showed about the same visits (a “dead heat”). For the Old Pasture (Fig. 6), Pro Antler clearly received significantly more visits than the other two feeds. Later, we will discuss possible reasons for these results.

Number of visitations is just one of three ways to analyze use and preference of feed types. Data also were obtained for the amount of time deer spent feeding during the first two weeks using video. We also looked at the total amount of feed consumed. A deer may frequent a feeder more times than another, but the time spent at the feeder and the amount of feed consumed are really the best criteria for analyzing deer feed. If deer come less often to a feeder, spend less time there, but consume more feed, it can be interpreted that feed may provide higher value with less effort to the deer; an important component of “foraging theory.”

Figures 7&8 present an analysis of the amount of total time spent by deer at the three types of feeders at Dalmont and Old Pastures during the first two week period. At Dalmont (Fig. 7), all deer spent more time at the Brand Z feed station than for Pro Antler. Total feeding time



	Doe	Fawn	Yearling buck	2-3 yo buck	4+ yo buck
Brand A	3.3	0.0	0.0	1.4	1.3
Brand Z	59.8	0.8	25.0	61.8	68.4
Pro Antler	22.5	0.0	8.8	32.1	49.7

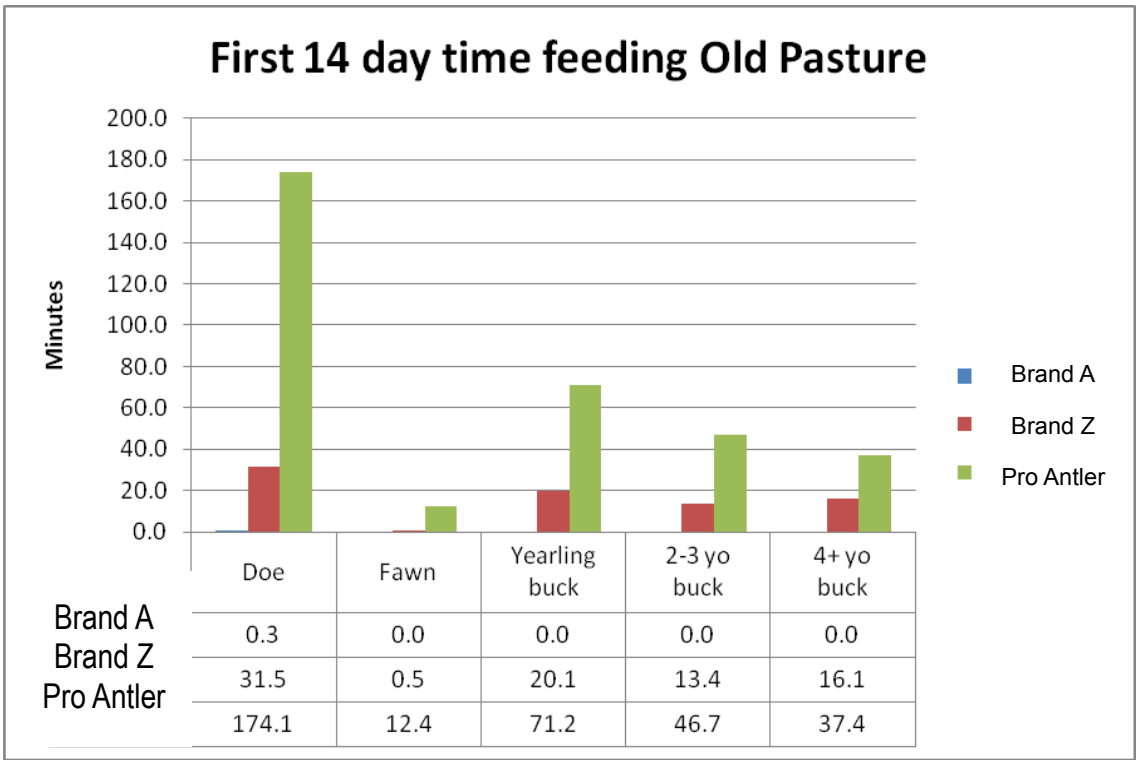
Figure 7. Total amount of time spent by deer at the Dalmont feeding stations.

at Dalmont for the three feeds were: 5.9 min. (Brand A), 215.7 min. (Brand Z) and 113.0 min. (Pro Antler). Figure 8 presents the same data for the Old Pasture. Similar to what we saw for visitations (Figs. 1-6), Figure 8 shows the exact opposite for the Old Pasture; deer of all demographics spent more time at the Pro Antler feeder than the remaining two feed types.

Total Feed Consumed

Numbers of visitations and amount of time spent at each feed station certainly are important in assessing preferences for feeds by deer, but the "bottom-line," especially in light of foraging theory, is how much feed was actually consumed. During the first 14-day period (Fig. 9), deer on each of the two study areas consumed an average of 271.8 lbs of Pro Antler, compared to 142.1 lbs of ("Brand Z" in Fig. 9) and only 4 lbs of ("Brand A"). During the second

week of the study (giving time for deer to become fully acclimated to the feeds), average consumption for Old and Dalmont Pastures was: 456.6 lbs for Pro Antler, 199.5 lbs for Brand Z, and only 34.8 lbs for Brand A feeds (Fig. 10). ***Total use for the entire 28 day study***



	Doe	Fawn	Yearling buck	2-3 yo buck	4+ yo buck
Brand A	0.3	0.0	0.0	0.0	0.0
Brand Z	31.5	0.5	20.1	13.4	16.1
Pro Antler	174.1	12.4	71.2	46.7	37.4

Figure 8. Total amount of time spent by deer at the Old Pasture feeding stations.

period (Fig. 11) averaged 728.25 lbs for Pro Antler, 341.6 lbs for Brand Z and again only 38.75 lbs for Brand A. **We have no reservations in declaring Pro Antler clearly the most heavily used feed in the study.**

There are two other ways to analyze our results. First, we looked at the variation in use between the two pastures. There were striking differences in use of Brand Z between the Dalmont and Old Pastures. Referring back to our methods section, we maintain two different densities and demographic structures in the two pastures for a very good reason. And, we often change densities and demographics for these pastures to fit our research needs. In this case, the deer density in the Old Pasture was one deer per 4 acres, with a buck:doe ratio of 2:1. The Dalmont Pasture, on the other hand, purposefully is now maintained at a density of 1 deer to 2 aces and

a buck:doe ratio of 4:1. This leads to the highest probability reason we recorded a difference in Brand Z use between the two pastures.

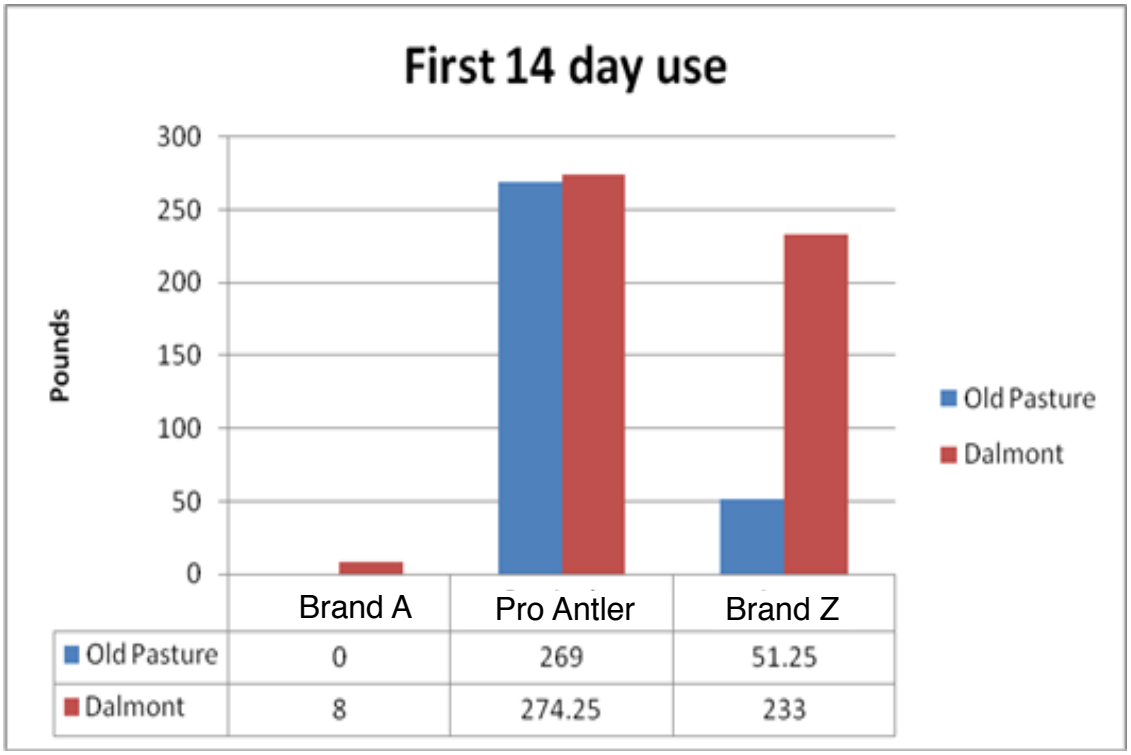


Figure 9. Feed consumed on the two study areas during the first two weeks of study.

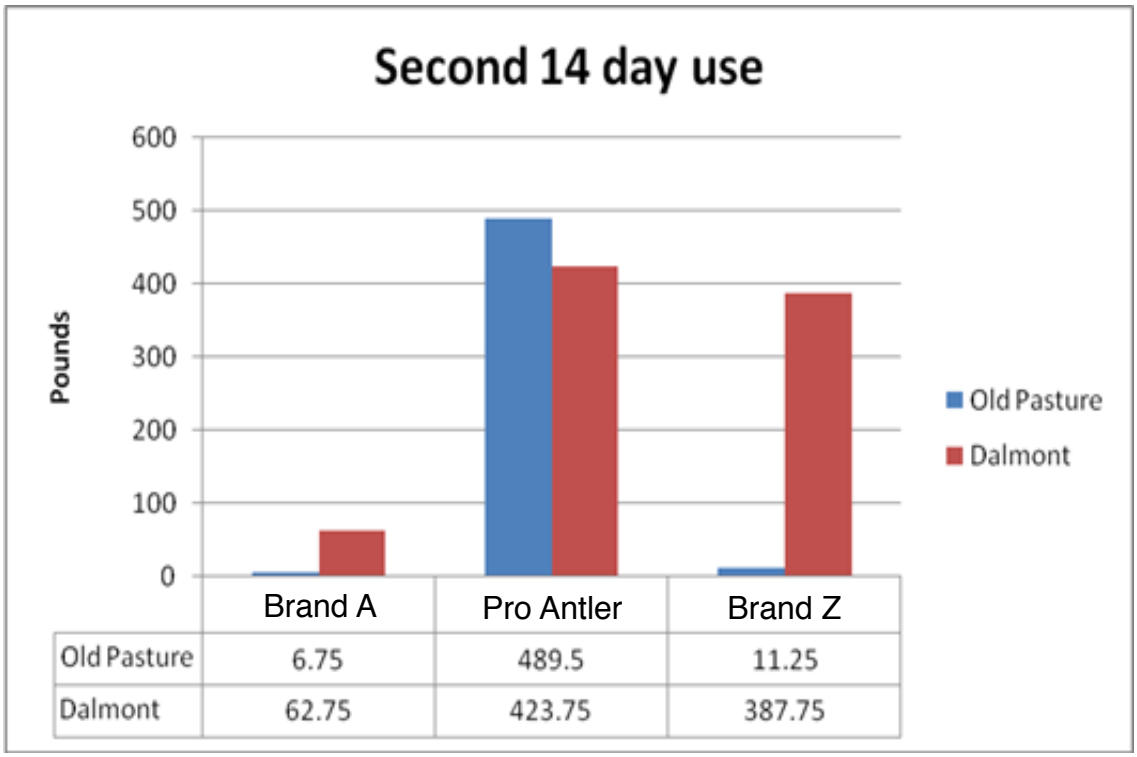


Figure 10. Feed consumed on the two study areas during the second two weeks of study.

At a higher density, the number and density of feeders becomes an important influence on feeder use. Our long-term observations on feeder use support the conclusion bucks, especially

mature bucks, tend to dominate feeders. Does and immature bucks often are excluded from feeding. At the time of this study, there were four protein feeders in service (the fourth feeder supplied our proprietary feed, but at a distance from the three feeder setup). Buck social groups are larger in the Dalmont Pasture and these groups are highly exclusionary for favorite feeders (Fig. 12). Hence, we calculated the percentage of mature buck social groups using each feeder.

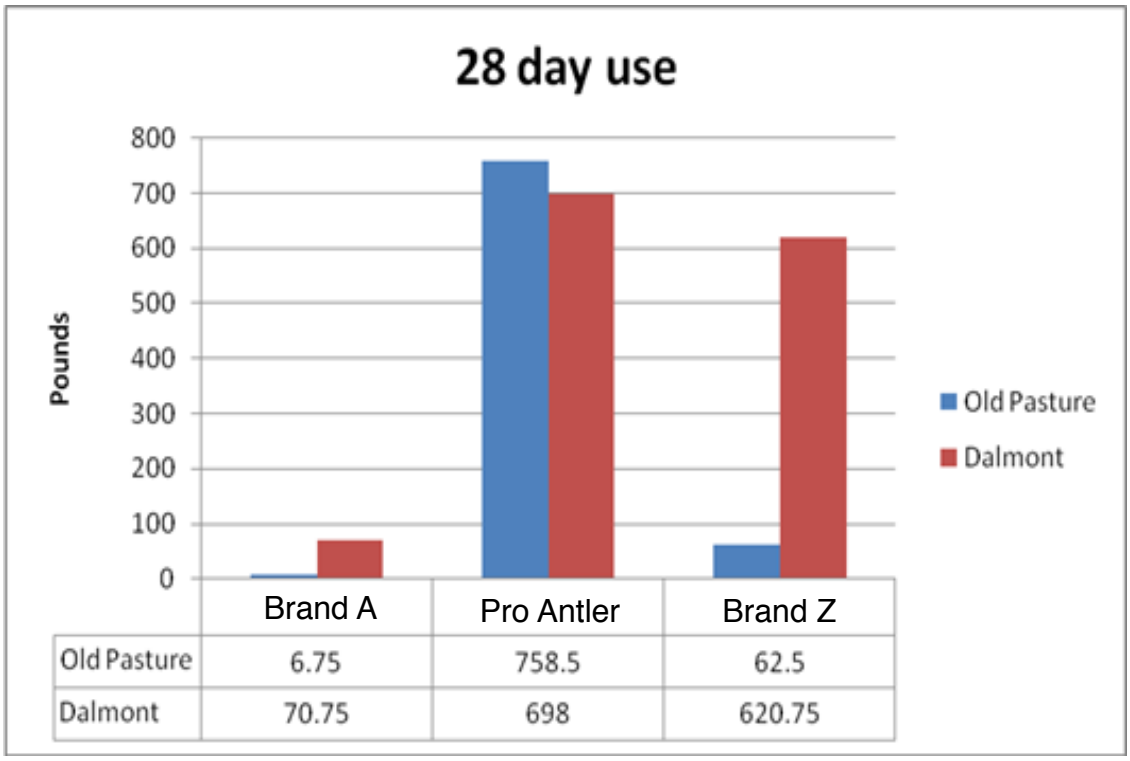
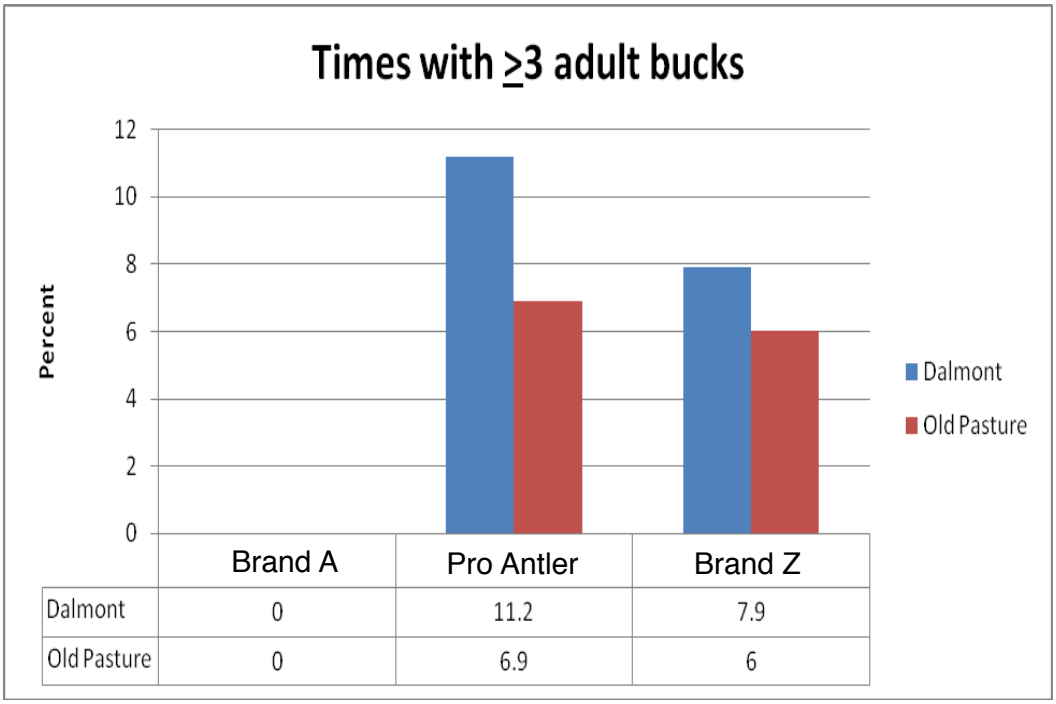


Figure 11. Total feed consumed at Dalmont and Old Pasture study sites.

The resulting graph (Fig. 13) is profound in there were almost twice as many mature buck group visitations (11.9 vs 6.9) at the Dalmont Pasture than the Old Pasture. The percentage of mature buck groups using Brand Z at both study sites was near parity (7.9 vs. 6). What is the significance of these observations? The presence of mature buck groups caused younger bucks and does to move to an alternative feeder, in this case Brand Z. It also is instructive to consider no mature buck social groups were recorded at the Brand A Sites. Hence, we conclude at the Dalmont site mature buck social groups had an affinity for the Pro Antler feeder, excluding other deer from this feeder; ultimately leading to secondary use of the Brand Z feeder.

On a final note, we decided after the end of the 28 day study period to test the hypothesis feeder location, although randomly assigned, may have influenced feeder use. Therefore, we removed all feed from the lowest use feed (Brand A), replacing it with the Pro Antler feed. Almost immediately, deer began to use this feeder (Fig. 14), clearly suggesting it was the feed rather than the location that influenced use.

Figure 12. Mature buck social groups often dominated feeders at the Dalmont Pasture site. This Pro Antler feed site was "guarded" by these groups, often excluding younger bucks and does.



	Brand A	Pro Antler	Brand Z
Dalmont	0	11.2	7.9
Old Pasture	0	6.9	6

Figure 13. Percentage of visitations by mature buck social groups at test feeders at Dalmont and Old Pasture sites.

Figure 14. NOTE: Feed type was replaced from Brand A to Pro Antler after the 28-day study period at both sites. Deer responded quickly to the change of feed as consumption rates also increased. This proves the geographic position of the feeders in the study had no bearing on the outcome of the feed consumed or number of deer visiting.

Conclusions

Our results clearly support a higher preference for Nutra Deer's Pro Antler 20% deer feed. Also, we feel a follow-up test in which we add additional Pro Antler feeding station would reduce the use of Brand Z in the Dalmont Pasture, because it would reduce dominance by mature buck social groups.

Dr. James Kroll Seal of Approval