

Feeding Deer on Browse Species During Winter

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INTRODUCTION

THE encroachment of civilization has resulted in restriction of deer ranges throughout the west. Nowhere is this more serious than in Utah. The problem presented by the scarcity of deer range has many facets. Among these, the food habits of mule deer and knowledge of the value of plants used by them in winter are of great importance. The investigation reported herein was undertaken to supply information upon these subjects, and is part of cooperative study involving the U. S. Forest Service, the Fish and Wildlife Service, and the Utah State Fish and Game Commission. Funds were made available for the study by the latter agency.

During the winter months of 1948, two mature deer were held captive near Logan, Utah and fed native browse plants. The deer were nearly two years old. The feeding period began on January 2 and closed March 9, 1948.

A total of 17 species of forage plants were included in the diet. These included all the plants common on deer winter range which were available near Logan. Big sagebrush (*Artemisia tridentata typica*), Utah juniper (*Juniperus utahensis*), and Rocky Mountain red juniper (*J. scopulorum*) were, except for the first few days, kept before the animals at all times. Two additional plants were offered each day in such sequence that all possible combinations of plants were included except that the hybrid mountain mahogany and black sage (*Artemisia tridentata nova*) were not so rotated. The first is uncom-

mon, the second infrequently present on deer winter ranges. All the material offered was weighed before being placed before the deer and reweighed as it was removed. Bundles of forage unavailable to the deer were exposed in a manner similar to those fed to the deer to provide a correction factor where changes of weight occurred from causes other than eating by the deer. Such weight changes were insignificant except when storms occurred. Periodically samples of vegetation were dried to provide a basis for converting all figures to air dry weights.

RESULTS AND DISCUSSION

The average daily consumption by each deer is shown by species in Table 1. In general the two animals seemed to exhibit similar preferences. Mountain mahogany (*Cercocarpus ledifolius*) proved most desirable of all the plants offered. Next in importance in the list, although based upon but one offering, was material from a hybrid between *C. montanus* and *C. ledifolius*. The order of preference shown by each deer thereafter differs somewhat. However, there are no instances in which major differences in relative palatability are evident. The daily consumption by deer 84 was higher for each species except for the least palatable plants. This is perhaps a reflection of his higher level of food intake. The widest difference in daily consumption occurred in the case of ceanothus (*Ceanothus velutinus*). With deer 84, this plant occupies 5th place, having been consumed at the rate of 439 grams daily, while it is in 8th place with but 254 grams in the case of

deer 85. This is the more remarkable in that on one day, deer 84 ate no ceanothus.

In few instances did either deer eat more of a plant low on the palatability

TABLE 1

Average daily consumption of browse species by two mule deer during winter (air dry)

SPECIES	DAYS FED	AVERAGE DAILY CONSUMPTION (GRAMS)	
		Deer 84	Deer 85
<i>Cercocarpus ledifolius</i>	12	1232	1167
<i>C. ledifolius</i> x <i>C. mon-</i>			
<i>tanus</i>	1	646	592
<i>Purshia tridentata</i>	12	455	391 ¹
<i>Cowania stansburiana</i>	11	440	440
<i>Ceanothus velutinus</i>	11	439	254 ¹
<i>Cercocarpus montanus</i>	9	401	356
<i>Quercus gambelii</i>	11	379	348
<i>Prunus melanocarpa</i>	11	277	277
<i>Amelanchier alnifolia</i>	12	275	217 ¹
<i>Juniperus scopulorum</i>	65	246	179
<i>Artemisia tridentata</i>			
<i>typica</i>	61	177	215
<i>Juniperus utahensis</i>	64	118	175
<i>Salix exigua</i>	11	111	108 ¹
<i>Acer grandidentatum</i>	11	100	140
<i>Sambucus coerulea</i>	11	97	37
<i>Artemisia tridentata nova</i> ..	7	59	49
<i>Chrysothamnus nauseosus</i> ..	12	28	28
Average daily consumption all species.....		1223	1167

¹ Not in order of consumption

ences were slight. In no instance, however, did these inversions involve *C. ledifolius*.

The average amount of forage consumed daily during the test by deer 84 was somewhat higher than for deer 85, although this difference was not marked, being only 1223 grams as compared to 1167 grams. In terms of pounds, the average daily consumption was 2.7 and 2.6 for deer 84 and 85 respectively.

The deer did not maintain their weights during the feeding period, although weight losses were not rapid. Deer number 84 weighed 106 pounds at the beginning of the feeding period and 93 pounds at the end, having lost 13 pounds. Deer number 85 similarly changed from 107 to 93 pounds, a loss of 14 pounds. The condition of the animals appeared to be very similar to that of animals of the same age and sex that were in the wild, on the basis of a few animals which were trapped.

Of particular interest were the observations made upon big sagebrush and the two species of juniper. These are among the most common of forage plants on winter range areas in Utah. For this reason, material from these plants was kept before the deer for almost the entire period. In consequence, however, of the considerable amount of labor involved in securing forage and weighing it prior to

TABLE 2

Variation in average daily consumption in grams of sagebrush and juniper by two mule deer

PLANT	WEEK OF TEST										AVE.
	1	2	3	4	5	6	7	8	9	10	
<i>A. tridentata typica</i> ...	136	22	55	46	192	297	379	291	242	240	196
<i>J. scopulorum</i>	365	158	185	400	262	178	182	351	194	208	212
<i>J. utahensis</i>	144	106	158	266	243	162	133	97	92	28	146

scale as shown in Table 1, than he did of any plant higher on the scale, provided the two plants were available at the same time. Seventeen such inversions occurred, although in two of these cases the differ-

and after it had been browsed, new material of these three species was not added each day. Only when the material showed evidence of being used was it replaced by new material. It is not, therefore, possible

to determine the total amounts eaten in any one day, since the weight loss observed throughout a period of several days was apportioned equally among the days involved. Even the weekly averages are only approximations due to the fact that the weekly periods and the replenishment dates for juniper do not always coincide. These data are shown in Table 2.

Of interest is the greater consumption of big sagebrush beginning at the 6th week. Often during this period the deer would first select big sagebrush upon beginning to feed. In spite of this, at no period did the average rate of consumption exceed a pound per day. During individual days, as much as 530 grams were eaten. It would appear from these data and from other tests, that deer reach satiation in the consumption of big sagebrush unless forced by lack of other forage to subsist almost wholly upon it.

Few observations were made upon black sage. On no occasion did either animal take any considerable volume of this plant, a fact that seems noteworthy in view of the high regard in which this

plant is held as domestic livestock forage on winter ranges.

The data in Table 2 indicate that both species of juniper were more heavily eaten at some periods than at others. Since it was discovered that individual plants of both these species as well as of sagebrush differed considerably in palatability, there is no means of knowing how much this periodic variation is due to the individuality of the plants offered, and how much it is a reflection of the tendency of the animals to have periodic variations in forage preferences.

The results secured can be accepted only tentatively since but two deer were included in the test. The results in some instances tend to confirm previous evaluations. However, the values shown are influenced both by preference of the animal as well as productivity of the species. Thus it cannot be stated that *C. ledifolius* is at the head of the list solely upon the basis of high palatability, since it is highly productive of forage during the winter season. Further observations are planned with these conditions in mind.