
**The Size and Weight of Elk from the Wichita
Mountains Wildlife Refuge, Oklahoma**

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INTRODUCTION

The annual disposal program at the Wichita Mountains Wildlife Refuge in Comanche County, Oklahoma has provided opportunities to secure elk (*Cervus canadensis*) weights and measurements. Similar studies have been reported from other areas by Quimby and Johnson (1951), Skinner (1946), and Murphy (1963). The present study compares the findings of previous reports with Wichita elk.

The data presented were procured from a management operation. As a result, some categories in the following tables represent information that is not statistically significant. One reason for this compilation is to define these areas of insufficient information.

METHOD

Most of the elk were shot by refuge personnel and brought to the slaughterhouse where they were weighed. After butchering, each of the four quarters was weighed on the same scales. The combined weight of the four quarters corresponds to the dressed carcass weights of Quimby and Johnson (1951) which were defined as ". . . whole weight less viscera, head, feet and skin." Some elk were driven into a killing chute at the slaughterhouse, shot, and dropped into the butchering room through a door. In both cases a small amount of blood was lost before the entire (whole) weights were obtained. As the losses were small, they are ignored. Measurements were taken with a steel tape within a short time after death.

As the elk were brought in they were aged by an experienced foreman, Melvin Roach. This permitted presentation of data for four age groups: calves, yearlings, two-year-olds, and adults. Calves were recognized by their small size and dentition, and the other age groups by emergence and wear of incisors (Murie, 1951). All weights are in pounds and all measurements are in inches.

WICHITA WEIGHTS

Tables I and II show weights for the period 1950 to 1965. The adult dressed carcass weights for bulls (Table I) totalled 264 so that the calculated mean carcass weight of 294 lb. can be considered reliable. The calculated yield is 52% for adult bulls and 56% for the 256 adult cows shown in Table II. The mean carcass weight of adult cows is 52 lb. less than that of bulls.

TABLE I. WICHITA REFUGE BULL ELK WEIGHTS, 1950-1965 INCL.

Age Class	Mean Whole Weight Range	No. Weighed	Mean Dressed Carcass Weight (lb.) Range	No. Weighed	Percent of Yield
Calf	169	1	80	1	47
Yrlg.	354 (320-385)	5	185 (135-229)	33	52
2-yr-old	468 (375-575)	10	247 (170-350)	38	53
Adult	562 (405-735)	31	294 (188-411)	264	52
Totals Weighed		47		336	

TABLE II. WICHITA REFUGE COW ELK WEIGHTS, 1950-1965 INCL.

Age Class	Mean Whole Weight Range	No. Weighed	Mean Dressed Carcass Weight (lb.) Range	No. Weighed	Percent of Yield
Calf	--	--	111 (103-119)	4	--
Yrlg.	324 (306-335)	3	174 (139-211)	19	54
2-yr-old	372	1	225 (159-287)	22	56*
Adult	431 (305-582)	40	242 (131-308)	256	56
Totals Weighed		44		301	

* Based upon one whole wt. (372) and the dressed carcass weight (207) of the same animal.

COMPARISONS

The following tables compare the weight and size of Wichita elk with published records of elk (subspecies *nelsoni*, Murie, 1951) native to or originating from the Yellowstone and Jackson Hole regions of northwestern Wyoming. With the exception of one bull, the elk of the Wichita Refuge were introduced from the Jackson Hole herd in 1911 and 1912 (Halloran, 1963). The origin of the National Bison Range elk near Moiese, Montana has been outlined in a 1966 note to Wichita Refuge Manager, Julian A. Howard, by Bison Range Refuge Manager Joseph P. Manzoni:

"There seems to be some discrepancy in our historical records re/elk introductions, but the following information is believed correct:

1911-7 elk introduced from Jackson Hole, Wyoming; first Bison Range elk.

1912-5 elk from same source.

1913-9 elk from same source.

1916-26 elk introduced from Yellowstone National Park.

According to our records, these are the only elk brought into the range—although elk from the surrounding area may have become involved over the years in terms of movement to and from the refuge."

Table III records mean whole weights of *Cervus canadensis nelsoni* from six sources. Even though three of the studies (Murie, 1951; Skinner, 1946; and Murphy, 1963) included two-year-olds, Wichita bulls and cows prove to be the lightest.

Table IV compares mean weights and percent of yield of Yellowstone and Wichita elk. The whole weight of Yellowstone cows is the same as the whole weight of Wichita bulls.

The calf sample of Table V is too small to be of significance. However, it is

TABLE III. MEAN WHOLE WEIGHTS OF *Cervus canadensis nelsoni* AS RECORDED IN THE LITERATURE

Location	Authority	Number of Specimens		Age (Years)	Whole Weight (lb.)	
		Bull	Cow		Bull	Cow
Jackson Hole Wyoming	Murie (1951)	15	29	2 +	620	510
Yellowstone Park	Skinner (1946)	15	9	2 +	642	499
Yellowstone Park	Quimby and Johnson (1951)	10	11	3 +	730	562
Missouri *	Murphy (1963)	5	8	2 +	742	539
Montana **	Wright (1956)	18	3	3 +	774	466
Oklahoma ***	This study	31	40	3 + +	562	431

* Introduced from Yellowstone National Park

** National Bison Range; Introduced from Jackson Hole and Yellowstone

*** Wichita Refuge; Introduced from Jackson Hole

TABLE IV. MEAN WEIGHTS AND WEIGHT RELATIONSHIP OF YELLOWSTONE AND WICHITA ELK COMPARED

Authority	Age Class	Time of Year Collected	Number of Specimens Weighed		Whole Weight (lb.)		Dressed Carcass Weight (lb.)		Mean Percent of Yield	
			Bull	Cow	Bull	Cow	Bull	Cow	Bull	Cow
Quimby & Johnson (Yellowstone)	3-years old and older	December	10*	11*	730	562	385	312	53	55
			31 (whole)	40 (whole)	562	431	294	256	52	56
This study (Wichita)	3-years old and older	October through December	264 (dressed)	256 (dressed)						

* Same animals used for whole and dressed carcass weights

TABLE V. STANDARD MEASUREMENTS IN INCHES OF MALE YELLOWSTONE AND WICHITA ELK CALVES COMPARED

Place and Authority	Number Measured	Total Length		Tail		Hind Foot		Ear	
		Mean	Range	Mean	Range	Mean	Range	Mean	Range
Yellowstone (Quimby & Johnson)	3*	68.92	67.50-71.25	5.08	4.75-5.50	22.25	22.00-22.50	7.17	7.00-7.50
Wichita (This Study)	1**	63.00	—	4.00	—	21.13	—	6.50	—

* Taken in Dec. 1949.

** Weighed 169 lb. entire. Carcass wt. was 80 lb. Butchered 10/28/58. Approx. 6 months old.

TABLE VI STANDARD MEASUREMENTS IN INCHES OF YEARLING YELLOWSTONE AND WICHITA ELK COMPARED

Place and Authority	Sex	Number Measured	Total Length		Mean	Tail		Mean	Hind Foot		Mean	Ear	
			Mean	Range		Mean	Range		Mean	Range		Mean	Range
Yellowstone (Quimby & Johnson)	M	2	79.00	75.00-83.00	5.00	5.00-5.00	24.25	24.00-24.50	8.12	8.00-8.25			
Wichita (This Study)	M	1	79.00	—	5.00	—	24.50	—	8.00	—			
Yellowstone	F	4	78.87	77.00-81.50	4.56	3.50-5.00	23.81	22.50-24.50	7.62	7.00-8.00			
Wichita	F	2	82.25	82.00-82.50	5.00	5.00-5.00	25.12	25.00-25.25	7.62	7.00-8.25			

TABLE VII. STANDARD MEASUREMENTS IN INCHES OF MATURE YELLOWSTONE AND WICHITA ELK COMPARED

Place and Authority	Sex	Number Measured	Total Length		Tail		Hind Foot		Ear	
			Mean	Range	Mean	Range	Mean	Range	Mean	Range
Yellowstone (Quimby & Johnson)	M	12	96.40	91.00-99.00	5.64	5.25-6.25	26.35	25.25-27.25	8.33	7.50-9.00
	M	23	93.30	86.00-104.50	5.15	4.00-6.50	25.53	24.00-27.00	8.29	8.00-9.00
	F	55	89.44	82.00-97.75	5.37	4.00-7.00	24.89	23.75-26.37	8.00	7.25-8.75
Wichita	F	17**	86.50	79.00-96.00	4.45	3.50-6.00	24.53	23.25-25.50	7.90	7.38-8.25

* 3-years old or older.

** Except tail measurement, which is 16.

entirely possible that the Wichita calf was smaller because it was younger. The Yellowstone calf was killed in late October. Table IV indicates a size similarity between Wichita and Yellowstone yearlings. Table VII clearly indicates that mature Wichita elk are smaller than the Yellowstone elk measured by Quimby and Johnson (1951). As in the case of the comparative weights, it is realized that the data presented are too scanty for anything but the advancement of some preliminary ideas. However, the information suggests that the smaller size and weight of the Oklahoma elk result from factors in the environment rather than a genetic drift to a smaller size. Insects, climate, available food, competition with other species, and lack of calcium on a granitic range could be involved. It must also be remembered that some of the weighed and measured elk from the other areas could have been fed hay or supplements at some time during their lives. The Wichita elk, on the other hand, are raised without hay or any supplements except salt.

LITERATURE CITED

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