
American Bison
Weights and Measurements
From the Wichita Mountains Wildlife Refuge

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The history of the American bison (*Bison bison*) has been well documented by Garretson (1934), Roe (1951), and others. However, there appears to be a dearth of information concerning weights and measurements of bison of known ages. The purpose of this paper is to present some of this information obtained from the Wichita Mountains Wildlife Refuge herd.

Gabrielson (1943) has described the beginnings of the bison herd on the Wichita Mountains Wildlife Refuge of southwestern Oklahoma. The area is now under the administration of the Bureau of Sport Fisheries & Wildlife, U. S. Fish & Wildlife Service of the Department of the Interior.

I wish to acknowledge the encouragement and assistance of Refuge Manager Julian A. Howard and others of the refuge staff. Without this aid the bison data could not have been secured.

There are many factors affecting the size and weight of a bison. In addition to age and sex, these include origin, range type, and management methods. The establishment of the refuge herd by the introduction of 15 bison from the New York Zoological Park in 1907 was officially outlined in the U. S. Forest Service publication (Anon 1928). It is less well known, however, that the New York Zoological Park bison herd was originally obtained from the Jones and Bedson herds (Gray, 1932). The foundation for the Jones herd was 57 wild calves captured in the Panhandle of Texas during the period 1885 to 1889 (Garretson, 1934). According to the same author, Jones added to this nucleus by purchase from individual owners. One of these acquisitions was from the Sam I. Bedson herd. The Bedson bison originated from wild calves captured for the Hon. James McKay, Provincial Secretary of Manitoba (Garretson, 1934). These historical notes trace the sources of the Wichita herd to both Texas and Canadian animals. In addition to the original 1907 plant, four bulls from the Fort Niobrara National Refuge in Nebraska were added to the Wichita herd in 1940 (Halloran & Glass, 1959). The Niobrara herd, established in 1913 was derived from eight bison; six of these were donated by J. W. Gilbert of

Friend, Nebraska; two bulls came from the Yellowstone herd (Garretson, 1934).

The Wichita bison roam in fenced pastures feeding on native grasses and other plants. No supplements other than salt are fed. The 59,000-acre Wichita Refuge embraces some of the area formerly occupied by the great southern herd of American bison (Anon, 1928). When all of these factors are brought to mind it is seen that, in all likelihood, the bison of the present study probably are comparable in weights and measurements to individuals of native wild herds of the past century.

The management of the Wichita herd has included vaccination for brucellosis. Dr. D. C. Bostwick, U.S.D.A. Agriculture Research Service, Ardmore, Oklahoma, recently stated (Pers. comm.), "No (brucella) reactors have been seen in (the Wichita) buffalo herd for years. In 1940-42 incidence of reactors was very high." The elimination of this disease is another factor that has tended to produce a herd more typical of indigenous animals of the last century as Roe (1951) states, "... but here again, hardly one single authenticated instance of disease among wild buffalo has ever been recorded." Hones and Winter (1956) say, "When considering the relationship of brucellosis among ruminants, it is believed that the disease spread from domestic cattle to buffalo who in turn gave it to elk."

The bison weight data (Tables I & II) represent seven years (1953-1959) of records plus a few selected weights of older animals from the 1960 season. Both butchered and live weights were secured in the fall and winter months during the annual disposal season when bison are sold or donated to keep herd numbers in line with range capacity (Halloran, 1957). The weight categories are labeled, "1½, 2½, etc." to indicate more accurately the age of these spring-born animals. The ages were determined from brands. All calves are branded with the last digit of their year of birth. Live weights were taken to the nearest five pounds and dressed weights to the nearest pound. In all cases, averages were calculated to the nearest pound. There is wide variation in the various weight classes. For example, the butchered weight of 209 2½ year old bulls varied from 283 to 518 pounds.

Weights of males between six months and 17½-years were obtained. Five hundred and ten animals were used to secure the average dressed weight in seventeen age classes. Data are scanty in the younger and older categories. Two hundred and thirty-seven live weights were taken. The record indicates that bulls continue to gain weight until they are approximately ten to twelve years of age. After that age, weights start to decrease. The heaviest bull was in the 12½-year class and tipped the scales at 1,795 pounds. Percentage of yield varies by age class between 47 and 58 percent, but centers around 54 percent.

Table II contains weight records of 251 butchered cow bison. As in the case of bulls, the butchered or dressed weight is that of the four quarters of the carcass with the hide, head, and viscera removed. All dressed weights were taken immediately after butchering. The heaviest cow on the live weight record was 6½-years of age and was recorded at 1,075 pounds. One hundred and twenty-seven cows of various ages from 2½ to 16½-years of age comprise the cow bison live-weight table.

Through the years many queries have been received concerning the size of Wichita bison in relation to those from other areas. As a first step in determining body size in animals of the local herd, 21 bulls and 17 cows (Tables III and IV) were measured. Standard measurements, including height at the shoulder, were taken just after the animals were killed. In addition to standard measurements, the tables include, butchered

TABLE I. BULL BISON WEIGHTS
Fall, 1953 - Fall, 1960

Age in Years	Average Dressed Weight (Wt. - Range)	Number Weighed	Average Live (Entire) Weight (Wt. - Range)	Number Weighed	Percent of Yield
1½	147	1	—	—	—
1¾	384 (289 - 391)	7	620 (575 - 675)	5	54
2½	437 (283 - 518)	209	803 (585 - 995)	109	54
3½	507 (390 - 667)	116	962 (755 - 1225)	49	53
4½	607 (383 - 775)	59	1126 (925 - 1300)	19	54
5½	670 (471 - 827)	32	1181 (860 - 1415)	15	57
6½	724 (547 - 899)	27	1358 (1015 - 1590)	12	53
7½	774 (652 - 854)	12	1417 (1345 - 1525)	6	55
8½	788 (657 - 911)	13	1463 (1285 - 1620)	5	54
9½	781 (676 - 929)	8	1343 (1315 - 1375)	3	58
10½	837 (762 - 986)	6	1534 (1425 - 1695)	4	55
11½	759 (667 - 869)	8	1422 (1300 - 1605)	3	53
12½	843 (720 - 989)	3	1795	1	47
13½	796 (793 - 789)	2	1405 (1380 - 1430)	2	57
14½	779 (730 - 823)	5	1400 (1360 - 1440)	2	56
15½	689	1	1345	1	52
17½	751	1	1425	1	53
Total Number Bulls Weighed		510		287	

TABLE II. COW BISON WEIGHTS
Fall, 1953 - Fall, 1960

Age in Years	Average Dressed Weight (Wt. - Range)	Number Weighed	Average Live (Entire) Weight (Wt. - Range)	Number Weighed	Percent of Yield
½	138	1			
1¼	228 (174 - 329)	4			
2¼	464 (429 - 559)	12	852 (780 - 985)	5	54
3¼	464 (409 - 538)	30	808 (740 - 990)	22	57
4¼	477 (348 - 624)	52	849 (725 - 1025)	21	56
5¼	467 (390 - 591)	42	853 (755 - 970)	19	55
6¼	485 (388 - 650)	32	853 (735 - 1075)	15	57
7¼	461 (400 - 542)	19	832 (760 - 930)	7	55
8¼	475 (400 - 557)	22	869 (770 - 1020)	16	55
9¼	477 (404 - 590)	12	882 (790 - 980)	7	54
10¼	477 (438 - 510)	7	890 (860 - 940)	3	54
11¼	473 (420 - 551)	8	867 (820 - 940)	3	55
12¼	474 (438 - 500)	5	878 (800 - 910)	5	54
13¼	449	2	850	1	53
14¼	431	1	780	1	55
15¼	416	1	855	1	49
16¼	470	1	960	1	49

Total Number Cows Weighed 251

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TABLE III. EXTERNAL MEASUREMENTS AND WEIGHTS OF BULL BISON
WICHITA MTS. WILDLIFE REFUGE, COMANCHE COUNTY, OKLAHOMA
Measurements in inches. Weights in pounds.

Age in Yrs.	Date Butchered	Total Length	Length Of Tail	Hind Foot	Ear (Notch)	Height At Shoulder	Butchered Weight	Entire Weight	Horns	
									Tip-to-tip	Greatest Spread
2½	10/ 1/58	105	16	24½	5-¾	58½	445	790	24-¾	25-½
2½	10/ 1/58	101-½	13	22½	5-¾	58	463	835	25-¾	24-¾
2½	10/ 1/58	103	16	23¾	5-¾	57-½	444	790	23-¾	23-½
2½	10/ 1/58	109	17	25	5-¾	61	506	810	25	26-½
2½	10/ 3/58	105½	14½	23½	5-½	58-¾	497	810	28	28
2½	10/ 3/58	109½	16	24	5-½	60	452	880	24	24-½
2½	9/29/59	105	11	22½	5	54	470	835	22	23-½
3½	10/ 4/60	105½	13½	22½	5-¾	62	548	965	26-½	27
4½	9/30/58	112	15½	23½	5-¾	60-½	630	1110	18	25-½
4½	10/ 1/59	114½	15½	23¾	5-½	64-½	558	1125	23-½	25
4½	10/ 1/59	109	14	22	5-¾	60-½	600	1130	25-½	27-½
5½	11/19/58	107	17	23¾	5-7/8	60	471	990	18-½	23
5½	9/29/59	102	13	21½	5	60	481	860	21-¾	23-½
5½	10/ 2/59	110	15	23½	5-½	63	673	1295	20-¾	24-½
7½	10/27/58	113	16	24½	6	71	796	1474	22-¾	26
7½	10/29/59	125	17	24½	6	68	752	1420	25	27-½
10½	10/13/59	121	16	23½	5-7/8	72	986	1695	24	26
11½	10/27/59	115	15	23½	5-¾	66	714	1360	23-¾	28
11½	10/28/59	123	14	23½	5-½	64	667	1300	29	32
12½	10/13/60	125	17	26	6	73-¾	989	1795	24-½	29
15½	10/27/59	117	15	24½	5-½	66	699	1345	24-¾	27

TABLE IV. EXTERNAL MEASUREMENTS AND WEIGHTS OF COW BISON
WICHITA MTS. WILDLIFE REFUGE, COMANCHE COUNTY, OKLAHOMA
Measurements in inches. Weights in pounds.

Age in yrs.	Date Butchered	Total Length	Length of tail	Hind Foot	Ear (notch)	Height at shoulder	Butchered		Tip-to-tip	Greatest Spread	Notes
							Weight	Entire Weight			
2½	11/18/58	101½	13½	22¾	5½	53¼	451	820	16	18¼	With calf.
2½	11/18/58	97½	12	21¾	5¼	55	452	800	21½	21½	With calf.
3½	9/29/59	102¾	14¼	22	5¾	58¾	533	870	16	18¾	Without calf.
4½	11/19/58	102¼	12¼	22½	5½	53	428	850	15½	20	With calf.
5½	11/19/58	102½	13	22½	5%	51	435	790	14%	16%	With calf.
5½	11/19/58	99¾	13¾	21¾	5%	55½	518	850	21%	21%	With calf.
5½	9/29/59	103	13	21½	5	58½	544	875	11¾	19	With calf.
5½	10/16/59	115	14	22	5¼	62	591	970	—	—	Without calf.
6½	11/20/58	102½	14½	21¾	4¾	55	402	735	9½	18	With calf.
6½	11/20/58	99	13	20¾	4%	54	388	740	15½	19	With calf.
6½	11/25/58	105½	13	21½	5%	56	462	850	16	19	With calf.
6½	11/25/58	96½	12½	22	5	54½	494	875	13½	18	With calf.
6½	12/4/58	112¾	15½	22	5%	59½	521	975	16%	18	With calf.
7½	11/19/58	100½	12¾	21½	5%	54	419	850	17%	20%	With calf.
8½	11/19/58	105	14	22	5	51	471	845	13%	19	With calf.
8½	11/19/58	103	14	22	5¼	52½	430	800	15%	20½	With calf.
9½	11/19/58	104½	12½	20	5%	55	429	790	10¼	19	With calf.

weight, live weight, tip-to-tip horn length, greatest spread, age, sex, and date of killing to make the record more complete. One 12½-year-old bull stood 1¼ inches over 6 feet at the shoulder and measured 10 feet 5 inches in length. The tallest cow stood 5 feet 2 inches at the shoulder. Most of the measurements of Tables III and IV are from average-run animals of various ages from the butchering programs of 1958 and 1959.

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