

Feed Inventory

Charts, Tables and Formulas

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Table 1 – Dry Matter Capacities of Upright Silos (Tons)								
Depth of Settled Silage	Inside Diameter of Silo							
	10	12	14	16	18	20	22	24
(ft.)								
2	0	0	1	1	1	1	1	2
4	1	1	2	2	3	3	4	5
6	1	2	3	4	5	6	7	9
8	2	3	4	6	7	9	11	13
10	3	4	6	8	10	12	15	18
12	4	6	8	10	13	16	19	23
14	5	7	10	13	16	20	24	29
16	6	9	12	15	19	24	29	35
18	7	10	14	18	23	28	34	41
20	8	12	16	21	27	33	40	48
22	9	14	19	24	31	38	46	55
24	11	15	21	27	35	43	52	62
26	12	17	24	31	39	48	58	69
28	13	19	26	34	43	54	65	77
30	15	21	29	38	48	59	71	85
32	16	23	32	41	52	65	78	93
34	18	25	35	45	57	71	85	102
36	19	28	38	49	62	77	93	110
38	21	30	41	53	67	83	100	119
40	22	32	44	57	72	89	108	128
42	24	34	47	61	77	96	116	138
44	26	37	50	65	83	102	124	147
46	27	39	53	70	88	109	132	157
48	29	42	57	74	94	116	140	167
50	31	44	60	78	99	123	148	177
52	32	46	63	82	104	128	155	185
54	34	48	66	86	109	134	163	194
56	35	50	69	90	114	140	170	202
58	37	53	72	94	118	146	177	210
60	38	55	75	97	123	152	184	219
62			77	101	128	158	191	227
64			80	105	133	164	198	236
66			83	109	137	170	205	244
68			86	112	142	176	212	253
70			89	116	147	182	220	261
72					152	187	227	270
74					157	193	234	278
76					161	199	241	287
78					166	205	248	295
80					171	211	255	304

Calculating Capacities With a Partially Fed Silo

To calculate tons remaining in a silo after part of the feed is removed, use the following steps:

1. Use the chart to determine the tons of silage when the silo was full _____ tons
2. Determine the tons in the silo filled to the height equal to the depth of silage removed. _____ tons
3. Remaining silage (#1 minus #2) _____ tons

Example: A 20 foot silo filled to a settled depth of 60 feet and 22 feet of height were fed off.

- | | | |
|----|-----------------------------|-----------------------|
| 1. | 20' x 60' silo (full) | 152 tons |
| 2. | 20' x 22' of silage fed off | <u>38 tons</u> |
| 3. | Remaining silage | 114 tons (dry matter) |

Table 2 - Capacities of Upright Silos (As-Fed Tons)			
Diameter and Settled Depth	Alfalfa Silage 60% Moisture	Corn Silage 65% Moisture	Ground Ear Corn 35% Moisture
12 x 30	57	62	83
12 x 40	80	87	112
12 x 50	104	111	142
14 x 40	114	121	155
14 x 50	148	158	197
14 x 55	164	175	220
16 x 50	200	210	260
16 x 60	250	260	320
16 x 65	270	280	350
18 x 50	260	270	330
18 x 60	320	340	410
18 x 70	390	400	480
20 x 60	410	420	510
20 x 70	490	500	600
20 x 80	580	580	690
24 x 60	620	620	740
24 x 70	740	740	870
24 x 80	870	850	1,000
24 x 90	1,000	970	1,140
30 x 80	1,430	1,480	1,590
30 x 90	1,650	1,710	1,800

Table 3 – Silo Capacities for Whole Shelled Corn			
Diameter and Settled Depth	“As-Fed” Tons		
	25% Moisture	30% Moisture	35% Moisture
12 x 30	84	92	101
12 x 40	112	124	136
12 x 50	142	156	173
14 x 40	156	170	187
14 x 50	195	220	240
14 x 55	220	240	260
16 x 50	260	280	310
16 x 60	310	340	380
16 x 65	340	370	410
18 x 50	330	360	400
18 x 60	400	440	480
18 x 70	470	510	570
20 x 60	490	540	570
20 x 70	580	640	700
20 x 80	660	730	810
24 x 60	720	790	880
24 x 70	840	930	1,020
24 x 80	970	1,070	1,180
24 x 90	1,090	1,200	1,330
30 x 80	1,530	1,680	1,860
30 x 90	1,730	1,900	2,100

Table 4 – Circular Storage Structures (Cubic Feet)

Depth (feet)	Inside Diameter of Silo (feet)											
	10	12	14	16	18	20	22	24	25	26	28	30
2	157	226	308	402	509	628	760	905	982	1062	1232	1414
4	314	452	616	804	1018	1257	1521	1810	1963	2124	2463	2827
6	471	679	924	1206	1527	1885	2281	2714	2945		3695	4241
8	628	905	1232	1608	2036	2513	3041	3619	3927	4247	4926	5655
10	785	1131	1539	2011	2545	3142	3801	4524	4909	5309	6158	7069
12	942	1357	1847	2413	3054	3770	4562	5429	5890	6371	7389	8482
14	1100	1583	2155	2815	3563	4398	5322	6333	6872	7433	8621	9896
16	1257	1810	2463	3217	4072	5027	6082	7238	7854	8495	9852	11310
18	1414	2036	2771	3619	4580	5655	6842	8143	8836	9557	11084	12723
20	1571	2262	3079	4021	5089	6283	7603	9048	9817	10619	12315	14137
22	1728	2488	3387	4423	5598	6912	8363	9953	10799	11680	13547	15551
24	1885	2714	3695	4825	6107	7540	9123	10857	11781	12742	14778	16965
26	2042	2941	4002	5228	6616	8168	9883	11762	12763	13804	16010	18378
28	2199	3167	4310	5630	7125	8796	10644	12667	13744	14866	17241	19792
30	2356	3393	4618	6032	7634	9425	11404	13572	14726	15928	18473	21206
32	2513	3619	4926	6434	8143	10053	12164	14476	15708	16990	19704	22619
34	2670	3845	5234	6836	8652	10681	12925	15381	16690	18052	20936	24033
36	2827	4072	5542	7238	9161	11310	13685	16286	17671	19113	22167	25447
38	2985	4298	5850	7640	9670	11938	14445	17191	18653	20175	23399	26861
40	3142	4524	6158	8042	10179	12566	15205	18096	19635	21237	24630	28274
42	3299	4750	6465	8445	10688	13195	15966	19000	20617	22299	25862	29688
44	3456	4976	6773	8847	11197	13823	16726	19905	21598	23361	27093	31102
46	3613	5202	7081	9249	11706	14451	17486	20810	22580	24423	28325	32515
48	3770	5429	7389	9651	12215	15080	18246	21715	23562	25485	29556	33929
50	3927	5655	7697	10053	12723	15708	19007	22619	24544	26546	30788	35343
52	4084	5881	8005	10455	13232	16336	19767	23524	25525	27608	32019	36757
54	4241	6107	8313	10857	13741	16965	20527	24429	26507	28670	33251	38170
56	4398	6333	8621	11259	14250	17593	21287	25334	27489	29732	34482	39584
58	4555	6560	8928	11662	14759	18221	22048	26239	28471	30794	35714	40998
60	4712	6786	9236	12064	15268	18850	22808	27143	29452	31856	36945	42412
62			9544	12466	15777	19478	23568	28048	30434	32918	38177	43825
64			9852	12868	16286	20106	24328	28953	31416	33979	39408	45239
66			10160	13270	16795	20735	25089	29858	32398	35041	40640	46653
68			10468	13672	17304	21363	25849	30762	33379	36103	41871	48066
70			10776	14074	17813	21991	26609	31667	34361	37165	43103	49480
72					18322	22619	27370	32572	35343	38227	44334	50894
74					18831	23248	28130	33477	36325	39289	45566	52308
76					19340	23876	28890	34382	37306	40351	46797	53721
78					19849	24504	29650	35286	38288	41412	48029	55135
80					20358	25133	30411	36191	39270	42474	49260	56549

To convert to bushels of corn, multiply cubic feet times .8 (If the corn is 15.5% moisture).

Use Table 5 to adjust for other moisture levels.

Table 5 – Volume Adjustments for Wet Corn		
Moisture Content	Bushels/Cubic Feet	
	Shelled Corn X	Ground Ear Corn X
15.5	.800	.515
16	.794	.510
17	.787	.508
18	.781	.500
19	.775	.495
20	.769	.488
22	.758	.476
24	.741	.465
26	.725	.455
28	.709	.444
30	.694	.435
32	.680	.427
34	.667	.420

Example: 20' diameter by 40' high unit with 28% moisture shelled corn

20' x 40' unit = 12,566 cubic feet (from Table 4)

12,566 x .709 (from Table 5) = 8,909 bushels

Table 6 – Bushel Weights of Grain

Moisture Content	Corn	Soybean	Barley	Oats	Rye	Wheat
5.00	49.81	54.95	43.20	28.97	50.69	54.63
6.00	50.34	55.53	43.66	29.28	51.23	55.21
7.00	50.88	56.13	44.13	29.59	51.78	55.81
8.00	51.43	56.74	44.61	29.91	52.35	56.41
9.00	52.00	57.36	45.10	30.24	52.92	57.03
10.00	52.58	58.00	45.60	30.58	53.51	57.67
10.50	52.87	58.32	45.85	30.75	53.81	57.99
11.00	53.17	58.65	46.11	30.92	54.11	58.31
11.50	53.47	58.98	46.37	31.10	54.42	58.64
12.00	53.77	59.32	46.64	31.27	54.73	58.98
12.50	54.08	59.66	46.90	31.45	55.04	59.31
13.00	54.39	60.00	47.17	31.63	55.36	59.66
13.50	54.71	60.35	47.45	31.82	55.68	60.00
14.00	55.02	60.70	47.72	32.00	56.00	60.35
14.50	55.35	61.05	48.00	32.19	56.33	60.70
15.00	55.67	61.41	48.28	32.38	56.66	61.06
15.50	56.00	61.78	48.57	32.57	56.99	61.42
16.00	56.33	62.14	48.86	32.76	57.33	61.79
16.50	56.67	62.51	49.15	32.96	57.68	62.16
17.00	57.01	62.89	49.45	33.16	58.02	62.53
17.50	57.36	63.27	49.75	33.36	58.38	62.91
18.00	57.71	63.66	50.05	33.56	58.73	63.29
18.50	58.06	64.05	50.36	33.77	59.09	63.68
19.00	58.42	64.44	50.67	33.98	59.46	64.07
19.50	58.78	64.84	50.98	34.19	59.83	64.47
20.00	59.15	65.25	51.30	34.40	60.20	64.88
21.00	59.90	66.08	51.95	34.84	60.96	65.70
22.00	60.67	66.92	52.62	35.28	61.74	66.54
23.00	61.45	67.79	53.30	35.74	62.55	67.40
24.00	62.26	68.68	54.00	36.21	63.37	68.29
25.00	63.09	69.60	54.72	36.69	64.21	69.20
26.00	63.95	70.54	55.46	37.19	65.08	70.14
27.00	64.82	71.51	56.22	37.70	65.97	71.10
28.00	65.72	72.50	57.00	38.22	66.89	72.08
29.00	66.65	73.52	57.80	38.76	67.83	73.10
30.00	67.60	74.57	58.63	39.31	68.80	74.14
31.00	68.58	75.65	59.48	39.88	69.80	75.22
32.00	69.59	76.76	60.35	40.47	70.82	76.32
33.00	70.63	77.91	61.25	41.07	71.88	77.46
34.00	71.70	79.09	62.18	41.70	72.97	78.64
35.00	72.80	80.31	63.14	42.34	74.09	79.85
36.00	73.94	81.56	64.13	43.00	75.25	81.09
37.00	75.11	82.86	65.14	43.68	76.44	82.38
38.00	76.32	84.19	66.19	44.39	77.68	83.71
39.00	77.57	85.57	67.28	45.11	78.95	85.08
40.00	78.87	87.00	68.40	45.87	80.27	86.50

***Bolted number is the standard weight and moisture level**

Drive-Over Silage Piles

1. Calculate cubic feet of feed
Average width x length x height (measured in feet)=cubic feet
2. Convert cubic feet to tons
Cubic feet x .011 = tons of forage (as fed)

Example: 30' x 60' x 4' pile
 $4 \times 30 \times 60 = 7,200$ cubic feet
 $7,200$ cubic feet x .011 = 79 tons of silage (as fed)

Ear Corn

Step 1 – Calculate the cubic feet of ear corn

Rectangular Cribs: Multiply average width x length x height

Example: 3' x 10' x 35' = 1,050 cubic feet

Round Cribs: Use π^2 x height

Example: 12' diameter round crib, 20' high
 $3.414 \times (6^2) \times 20' = 2,458$ cubic feet

Step 2 – Calculate bushels Cubic feet x .4 = bushels

Example:
Rectangular crib (above example) $1,050 \times .4 = 420$ bushels
Round crib (above example) $2,458 \times .4 = 983$ bushels

Bunker Silo Forage

Use the following steps to determine the tonnage of forage in your bunker silos:

1. Determine cubic feet of forage
 Average height x width x length (measured in feet) = _____ ft³
 _____ x _____ x _____ = _____ ft³

2. Multiply cubic feet times the density of feed (Use your tested value if you have it)

	Dry Matter Value	As Fed
	_____ #/ft ³	_____ #/ft ³

3. Multiply #1 x #2 for total pounds of forage

	_____ #	_____ #
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4. Divide by 2000 to calculate tonnage

	_____ tons	_____ tons
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Example: 9' x 36' x 80' Bunker Silo
 9 x 36 x 80 = 25,920 cubic feet
 25,920 x 40 = 1,036,800 pounds (as fed)
 1,036,800) 2000 = 518 tons of feed (as fed)

Silage Bags

<u>Diameter</u>	<u>*Tons of feed/foot of bag length</u>
8 ft.	1.0
9 ft.	1.2
10 ft.	1.5
12 ft.	2.2

*Based on 65% moisture and 13 lbs/ft³ density

Example: 9 ft diameter bag, 75 feet long

1.2 x 75 = 90 tons of forage (as fed)