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# ESTIMATED COST OF STORING AND HANDLING GRAIN IN COMMERCIAL ELEVATORS, 1971-72

Author: Edward L. Brown

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## ABSTRACT

This report develops estimated handling and storage costs associated with operating commercial grain elevators in 1971-72. Cost estimates were based on projections of grain production, disappearance, and price levels since the base year, 1967-68. The 1971-72 projected average cost of 16.9 cents for storing a bushel of grain for 1 year is 20 percent above similar 1967-68 costs. A 10-percent increase in volume would lower the 1971-72 projected cost to 15.7 cents. A 10-percent reduction in volume would raise the 1971-72 projection to 18.4 cents. The longrun competitive storage rate, which provides the cost of replacing facilities at 1971-72 price levels, is estimated at 12 cents per bushel or 33 percent higher than the comparable cost in 1967-68. A combination of storage and handling costs particular to the type of facility is 22.5 cents, 24.3 cents, and 19.3 cents per bushel at country, inland terminals, and port terminals, respectively.

Key Words: Average costs, Storage, Handling, Average occupancy, Projections, Competitive rates.

## PREFACE

This report updates the cost analysis of a 1968 survey of 96 commercial grain elevators. The original data were reported in Costs of Storing and Handling Grain in Commercial Elevators, 1967-68, and Projections for 1969-70, U.S. Dept. Agr., Econ. Res. Serv., ERS-401, Feb. 1969. The 1967-68 costs were updated by projecting 1971-72 handling and storage volumes and input costs.

These projected costs assume the same industry structure and practices in 1971-72 as in 1967-68. They do not take into account the effect of firms entering or leaving the industry or of changes in efficiencies resulting from efforts of operators to hold down or lower costs.

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ESTIMATED COST OF STORING AND HANDLING GRAIN  
IN COMMERCIAL ELEVATORS, 1971-72

By Allen G. Schienbein  
Agricultural Economist  
Marketing Economics Division  
Economic Research Service

HIGHLIGHTS

Increases in the cost of major inputs since 1967-68 will cause higher operating costs for all methods of handling grain in commercial elevators during the 1971-72 season. Although projected average occupancy is higher--49 percent in 1971-72, compared with 42 percent in 1967-68--it is not sufficient to offset these increased costs; thus, the per bushel cost of storing grain is expected to rise.

Based on projections of cost and volume changes since the 1967-68 grain cost study, the storage costs at all commercial elevators is 16.9 cents per bushel (table 1). This is an increase of 20 percent or 2.9 cents per bushel above comparable cost in 1967-68.

Utilizing facilities at the projected 1971-72 occupancy levels (table 2) results in average yearly storage costs of 14.6, 18.8, and 15.4 cents per bushel at country elevators, inland terminals, and port terminals, respectively (table 1). Comparable costs for 1967-68 were 11.8, 15.5, and 13.3 cents per bushel. An increase of 10 percent in the 1971-72 projected stored volumes shows storage costs of 13.6 cents at country elevators, 17.4 cents in inland terminals, and 14.3 cents at port terminals (table 20). A decrease of 10 percent in 1971-72 volumes results in storage costs of 15.8, 20.5, and 16.8 cents per bushel at country elevator, inland and port terminals, respectively.

The 1971-72 combined cost of handling and storing grain at country elevators is 22.5 cents per bushel. This includes the cost of storage for 1 year plus the cost of receiving by truck and shipping by rail. Comparable cost was 18.3 cents in 1967-68.

At inland terminals, the combined 1971-72 cost of receiving and shipping by rail plus storage for 1 year is estimated to average 24.3 cents per bushel, compared with 20.0 cents in 1967-68.

For port terminals, the cost of receiving by rail, storing for 1 year, and shipping by water is estimated at 19.3 cents per bushel in 1971-72, compared with 16.7 cents in 1967-68.

Assuming a maximum storage capacity requirement of nearly 3.4 billion bushels, estimated 1971-72 longrun storage and handling competitive rates are 19.0, 16.0 and 21.5 cents per bushel at country elevators and inland and port terminals, respectively (table 1). Comparable 1967-68 costs were 3.5 to 4.5 cents per bushel lower at each facility. These longrun rates would provide for replacement of facilities at 1971-72 price levels and a 7.0 percent return on investment for the elevator space needed to store 1971-72 volumes, when utilized at 65 percent of capacity.

An estimated longrun competitive storage rate of 12.0 cents per bushel will provide the maximum storage space requirement of the United States in 1971-72. The comparable cost in 1967-68 was 9.0 cents per bushel. The estimated longrun competitive rates for storage are 12.5, 10.5, and 19.0 cents per bushel at country elevators and inland and port terminals, respectively, compared with 9.0, 8.0, and 13.0 cents per bushel in 1967-68.

Shortrun competitive rates would cover the out-of-pocket or cash cost of the marginal firm under conditions of pure competition. The total shortrun storage and handling competitive rates are 10.5, 9.0, and 9.0 cents per bushel, while storage cost is 5.0, 4.0, and 5.5 cents per bushel at country elevators and inland and port terminals, respectively (table 1). Comparable costs for 1967-68 are 8.0, 6.0, and 7.0 cents per bushel for storage and handling, and 4.0, 3.0, and 4.0 cents for storage only at respective facilities.

Estimated 1971-72 costs by item, function, and type of facility are shown in tables 16-19.

Table 1.--Estimated weighted average costs and competitive rates per bushel for handling and storing grain by area, type of facility, and handling method, United States, fiscal 1971-72 1/

Area, type of facility, and handling method	Average costs for--								Competitive rates <u>2/</u>			
	Receiving		Shipping		Storage		Combined		Storage		and handling	
	Out-of-pocket	Total	Out-of-pocket	Total	Out-of-pocket	Total	Out-of-pocket	Total	Short-run	Long-run	Short-run	Long-run
	cost	cost	cost	cost	cost	cost	cost	cost	5/	6/	5/	6/
	3/	4/	3/	4/	3/	4/	3/	4/	run	run	run	run
	Cents											
<u>North Plains</u>												
Country:												
Truck & rail <u>7/</u> ...	2.3	2.8	1.8	2.2	6.3	14.2	10.4	19.2	7.5	21.0	11.5	29.5
Inland terminal:												
Rail & rail <u>8/</u> ...	1.5	2.0	1.6	2.1	5.5	13.6	8.6	17.7	3.5	8.5	6.0	12.5
<u>Mid-Plains</u>												
Country:												
Truck & rail.....	2.1	3.0	3.6	5.4	4.7	15.7	10.4	24.1	3.5	10.0	9.5	18.5
Inland terminal:												
Rail & rail.....	1.7	2.6	2.4	3.6	4.6	19.2	8.7	25.4	2.5	8.0	6.0	14.5
<u>South Plains</u>												
Country:												
Truck & rail.....	2.4	3.6	3.5	5.4	5.6	12.8	11.5	21.8	4.0	9.0	11.0	16.0
Inland terminal:												
Rail & rail.....	1.6	2.6	2.1	2.9	6.1	18.1	9.8	23.6	4.5	6.5	8.5	12.5
Port terminal:												
Rail & water <u>9/</u> ...	1.6	2.0	0.9	1.0	4.3	15.0	6.8	18.0	4.0	14.5	5.0	16.5
<u>West</u>												
Country:												
Truck & rail.....	1.9	2.9	2.6	3.8	5.7	21.6	10.2	28.3	2.5	13.0	6.5	18.0
Inland terminal:												
Rail & rail.....	2.7	3.2	1.8	2.1	5.5	13.7	10.0	19.0	3.5	8.5	6.5	10.5
Port terminal:												
Rail & water.....	1.3	2.1	0.7	1.2	4.1	16.7	6.1	20.0	1.5	16.0	3.0	18.5
<u>Great Lakes</u>												
Country:												
Truck & rail.....	1.4	1.9	1.8	2.3	5.3	15.3	8.5	19.5	6.0	13.0	11.0	19.5
Inland terminal:												
Rail & rail.....	2.2	3.3	1.7	2.0	5.7	15.8	9.6	21.1	5.5	16.0	9.5	21.0
Port terminal:												
Rail & water.....	2.6	3.9	1.1	1.6	4.4	12.4	8.1	17.9	5.0	18.0	10.0	22.0
<u>South &amp; East</u>												
Country:												
Truck & rail.....	1.7	2.4	2.5	3.4	4.3	13.7	8.5	19.5	4.5	15.0	9.0	20.5
Inland terminal:												
Rail & rail.....	0.8	1.4	0.6	0.9	13.3	46.4	14.7	48.7	10.5	26.0	13.5	30.0
Port terminal:												
Rail & water.....	1.6	2.2	1.0	1.7	3.6	21.9	6.2	25.8	3.5	18.0	5.0	21.5
<u>United States</u>												
Country:												
Truck & rail.....	2.2	3.1	3.2	4.8	6.0	14.6	11.4	22.5	5.0	12.5	10.5	19.0
Inland terminal:												
Rail & rail.....	1.7	2.6	2.1	2.9	5.4	18.8	9.2	24.3	4.0	10.5	9.0	16.0
Port terminal:												
Rail & water.....	1.8	2.6	0.9	1.3	4.2	15.4	6.9	19.3	5.5	19.0	9.0	21.5
All facilities <u>10/</u> ..	--	--	--	--	5.1	16.9	--	--	5.0	12.0	--	--

1/ Cost based on estimated 1971-72 replacement values and volumes assumed to be distributed as in 1967-68.

2/ Rates based on 1971-72 cost and volume estimates. Calculations based on assumption that all facilities would be utilized at 65-percent capacity and the described handling method would be used. 3/ Excludes depreciation and interest on investment. 4/ Includes depreciation and interest on investment. 5/ Cost of marginal firm excluding depreciation and interest on investment. 6/ Cost of marginal firm including depreciation and interest on investment. 7/ Grain received by truck, stored, and shipped by rail. 8/ Grain received by rail, stored, and shipped by rail. 9/ Grain received by rail, stored, and shipped by water. 10/ Average handling costs omitted due to different receiving and shipping methods for each type of facility.

Note: See table 2 for delineation of areas.

Table 2.--Average occupancy levels by area and type of facility, United States, fiscal 1967-68 and 1971-72

Area	Average occupancy	
	1967-68 1/	1971-72 2/
	Percent	
North Plains 3/.....	39.4	46.4
Mid-Plains 4/.....	24.7	27.2
South Plains 5/.....	45.6	50.5
West 6/.....	45.3	55.6
Great Lakes 7/.....	62.5	82.0
South and East 8/.....	60.7	61.5
United States.....	41.6	49.3
Country.....	42.1	47.3
Inland terminals.....	26.8	30.3
Port terminals.....	58.2	72.1

1/ Plants surveyed in 1967-68.

2/ Projections for 1971-72.

3/ N. Dak., S. Dak., and Minn., (excluding port facilities.)

4/ Nebr., Kans., Colo., Wyo., Iowa, and Mo.

5/ Okla., N. Mex., and Texas plus all Gulf port facilities.

6/ Wash., Oreg., Idaho, Mont., Calif., Ariz., Nev., and Utah.

7/ Wis., Ill., Ind., Ohio, Mich., and Minn. port facilities

8/ Ark., Miss., S.C., Tenn., Ky., N.Y., Va., Pa., N.J., Md., Del., La., Ala., Ga., N.C., W. Va., and New England. (All Gulf ports are included in the South Plains).

Table 3.--Estimated maximum storage requirements by area and type of facility,  
 United States, fiscal 1967-68 and 1971-72 1/

Area	1967-68	1971-72
	<u>Million bushels</u>	
North Plains.....	353	391
Mid-Plains.....	1,025	1,254
South Plains.....	533	488
West.....	213	202
Great Lakes.....	636	711
South and East.....	283	324
United States.....	3,043	3,370
Country.....	2,204	2,465
Inland terminals.....	607	665
Port terminals.....	232	240

1/ Estimated on basis of maximum stocks, adjusted for required working space.  
 Maximum stocks estimated on basis of total supply and disappearance projections.

Note: See table 2 for delineation of areas.

Table 4.--Country facilities: Capacity available for storage and handling of grains at indicated longrun cost levels, 65 percent average occupancy, by area and United States, fiscal 1971-72

Longrun cost per bushel (cents) <u>1/</u>	Storage capacity of plants in--					
	North Plains	Mid- Plains	South Plains	West	Great Lakes	United States <u>2/</u>
	----- <u>1,000 bushels</u> -----					
Less than--						
14.0.....	--	330,520	245,802	--	46,812	623,134
15.0.....	--	636,852	273,331	--	262,879	1,173,062
16.0.....	--	780,453	284,441	--	344,835	1,583,469
17.0.....	20,937	868,828	405,888	--	389,206	1,858,597
18.0.....	20,937	908,131	530,495	103,256	422,839	2,159,397
19.0.....	20,937	1,022,707	566,487	197,459	485,332	2,466,661
20.0.....	20,937	1,065,492	566,487	267,506	554,506	2,700,174
21.0.....	46,382	1,299,661	566,487	267,506	554,506	2,959,787
22.0.....	46,382	1,429,964	702,068	267,506	583,207	3,325,785
23.0.....	74,775	1,512,752	702,068	274,603	603,847	3,464,703
24.0.....	90,000	1,536,244	706,985	274,603	603,847	3,508,337
25.0.....	90,000	1,553,184	706,985	274,603	629,897	3,551,326
26.0.....	262,353	1,553,184	830,334	312,621	629,897	3,885,047
27.0.....	281,904	1,560,959	830,334	325,301	629,897	3,925,053
28.0.....	281,904	1,560,959	830,334	350,093	629,897	3,949,845
29.0.....	281,904	1,566,698	830,334	350,093	721,943	4,082,626
30.0.....	347,293	1,574,727	830,334	359,782	742,886	4,186,675
31.0.....	416,454	1,579,494	830,334	359,782	775,993	4,293,710
32.0.....	455,322	1,579,494	839,383	359,782	775,993	4,341,627
33.0.....	471,276	1,579,494	839,383	366,571	775,993	4,364,370
34.0.....	471,276	1,599,877	839,383	369,390	779,013	4,390,592
35.0.....	488,300	1,604,414	839,383	369,390	779,013	4,412,153
36.0.....	510,229	1,612,967	841,842	369,390	783,764	4,449,845
37.0.....	536,033	1,617,377	843,690	371,241	793,038	4,493,033
All plants.	570,850	1,689,192	869,325	371,241	798,847	4,647,567

1/ Cost of receiving by truck, storage for 1 year, and shipping by rail; includes depreciation and interest on investment based on estimated 1971-72 price levels.

2/ Includes South and East.

Note: See table 2 for delineation of areas.

Table 5.--Inland terminals: Capacity available for storage and handling of grains at indicated longrun cost levels, 65 percent average occupancy, by area and United States, fiscal 1971-72

Long-run costs per bushel: (cents) <u>1/</u>	Storage capacity of plants in--					
	North Plains	Mid- Plains	South Plains	West	Great Lakes	United States <u>2/</u>
	- - - - - <u>1,000 bushels</u> - - - - -					
Less than--						
9.0.....	--	234,428	16,376	--	--	250,804
10.0.....	15,863	234,428	16,376	--	--	266,668
11.0.....	68,560	234,428	16,376	--	--	319,364
12.0.....	68,560	290,972	16,376	10,026	--	385,933
13.0.....	87,081	290,972	118,354	20,457	--	516,864
14.0.....	87,081	303,826	138,804	20,457	--	550,168
15.0.....	87,081	316,165	176,045	20,457	--	599,749
16.0.....	96,407	391,685	176,045	20,457	--	684,595
17.0.....	96,407	424,698	191,241	20,457	--	732,802
18.0.....	96,407	463,824	191,241	20,457	--	771,930
19.0.....	96,407	545,805	221,147	20,457	--	883,817
20.0.....	96,407	567,003	228,002	20,457	81,041	992,910
21.0.....	96,407	568,992	228,002	20,457	86,953	1,000,812
22.0.....	107,715	593,505	246,785	20,457	86,953	1,055,415
23.0.....	107,715	622,401	246,785	20,457	102,325	1,099,683
24.0.....	117,751	622,401	246,785	20,457	102,325	1,109,719
25.0.....	117,751	622,401	246,785	27,605	107,783	1,122,325
26.0.....	120,213	630,910	246,785	27,605	118,698	1,149,507
27.0.....	120,213	630,910	246,785	27,605	118,698	1,149,507
28.0.....	120,213	630,910	246,785	27,605	118,698	1,149,507
29.0.....	120,213	634,404	246,785	27,605	118,698	1,157,855
30.0.....	120,213	634,404	246,785	27,605	118,698	1,157,855
All plants..	127,207	637,477	246,785	27,605	118,698	1,213,809

1/ Cost of receiving by rail, storage for 1 year, and shipping by rail; includes depreciation and interest on investment based on estimated 1971-72 price levels.

2/ Includes South and East.

Note: See table 2 for delineation of areas.

Table 6.--Port terminals: Capacity available for storage and handling of grains at indicated longrun cost levels, 65 percent average occupancy, by area and United States, fiscal 1971-72

Longrun cost per bushel (cents) <u>1/</u>	Storage capacity of plants in--				
	Gulf	West	Great Lakes	East	United States
	----- <u>1,000 bushels</u> -----				
Less than--					
11.0.....	--	13,428	--	--	13,428
12.0.....	--	13,428	--	--	13,428
13.0.....	13,188	13,428	--	--	26,616
14.0.....	24,067	13,428	--	--	37,495
15.0.....	24,067	31,620	36,047	17,395	109,129
16.0.....	46,726	31,620	36,047	17,395	131,788
17.0.....	64,912	31,260	68,388	17,395	182,315
18.0.....	64,912	34,204	68,388	17,395	184,899
19.0.....	64,912	34,204	68,388	17,395	184,899
20.0.....	77,400	49,780	68,388	17,395	212,963
21.0.....	77,400	49,780	78,990	17,395	223,565
22.0.....	77,400	49,780	109,815	25,459	262,454
23.0.....	93,675	49,780	109,815	38,143	291,413
24.0.....	93,675	49,780	109,815	38,143	291,413
25.0.....	93,675	49,780	129,959	38,143	311,557
26.0.....	93,675	49,780	129,959	38,143	311,557
27.0.....	93,675	49,780	135,112	38,143	316,710
28.0.....	93,675	49,780	135,112	38,143	316,710
29.0.....	93,675	54,136	135,112	38,143	321,066
30.0.....	93,675	58,133	135,112	38,143	325,063
31.0.....	93,675	58,133	135,112	38,143	325,063
32.0.....	93,675	58,133	135,112	38,143	325,063
33.0.....	93,675	58,133	135,316	38,143	346,267
All plants.....	98,110	59,874	156,316	43,181	357,481

1/ Cost of receiving by rail, storage for 1 year, and shipping by water; includes depreciation and interest on investment based on estimated 1971-72 price levels.

Note: See table 2 for delineation of areas.

Table 7.--Country facilities: Capacity available for grain storage at indicated longrun cost levels, 65 percent average occupancy, by area and United States, fiscal 1971-72

Longrun cost per bushel (cents) <u>1/</u>	Storage capacity of plants in--					
	North Plains	Mid- Plains	South Plains	West	Great Lakes	United States <u>2/</u>
	----- 1,000 bushels -----					
Less than--						
6.0.....	--	115,128	203,432	--	--	318,560
7.0.....	--	169,546	221,531	--	18,326	409,403
8.0.....	--	718,897	246,299	--	46,812	1,012,008
9.0.....	--	783,536	248,758	--	46,812	1,079,106
10.0.....	--	959,775	488,345	--	340,794	1,788,914
11.0.....	--	1,047,837	568,929	--	369,354	1,986,121
12.0.....	--	1,068,519	679,671	--	472,121	2,394,049
13.0.....	--	1,179,168	725,532	65,322	484,730	2,628,491
14.0.....	20,937	1,279,089	833,730	252,904	557,202	3,117,601
15.0.....	38,887	1,475,260	839,947	262,781	597,960	3,440,081
16.0.....	38,887	1,515,530	843,435	333,121	618,902	3,646,532
17.0.....	46,382	1,572,830	860,276	340,218	647,603	3,763,967
18.0.....	71,903	1,591,998	860,276	340,218	647,603	3,808,656
19.0.....	100,296	1,614,304	860,276	350,093	694,293	3,915,920
20.0.....	122,995	1,614,304	860,276	350,093	694,293	3,938,619
21.0.....	271,133	1,614,304	860,276	361,943	738,456	4,142,770
22.0.....	309,709	1,623,845	860,276	361,943	775,993	4,228,424
23.0.....	342,687	1,631,621	869,325	366,613	775,993	4,282,896
24.0.....	401,009	1,631,621	869,325	371,241	783,764	4,405,071
25.0.....	407,112	1,631,621	869,325	371,241	783,764	4,411,175
26.0.....	451,457	1,676,112	869,325	371,241	783,764	4,500,010
27.0.....	503,933	1,676,112	869,325	371,241	783,764	4,552,487
28.0.....	528,003	1,676,112	869,325	371,241	783,764	4,576,557
29.0.....	528,003	1,684,665	869,325	371,241	783,764	4,585,110
All plants....	570,850	1,689,192	869,325	371,241	798,847	4,647,567

1/ Cost of storage for 1 year; includes depreciation and interest on investment based on estimated 1971-72 price levels.

2/ Includes South and East.

Note: See table 2 for delineation of areas.

Table 8.--Inland terminals: Capacity available for grain storage at indicated longrun cost levels, 65 percent average occupancy, by area and United States, fiscal 1971-72

Longrun cost per bushel (cents) <u>1/</u>	Storage capacity of plants in--					
	North Plains	Mid- Plains	South Plains	West	Great Lakes	United States <u>2/</u>
	----- 1,000 bushels -----					
Less than--						
6.0.....	15,863	234,428	16,376	--	--	266,668
7.0.....	68,560	234,428	118,354	--	--	421,342
8.0.....	68,560	280,666	118,354	--	--	467,580
9.0.....	97,117	337,209	118,354	20,457	--	573,137
10.0.....	97,117	360,634	148,260	20,457	--	626,469
11.0.....	102,946	441,610	185,501	20,457	--	750,514
12.0.....	102,946	512,728	212,806	20,457	--	848,937
13.0.....	112,272	560,315	212,806	20,457	--	905,850
14.0.....	112,272	585,075	246,785	20,457	--	964,588
15.0.....	117,751	587,064	246,785	20,457	17,241	989,297
16.0.....	117,751	588,477	246,785	27,605	81,041	1,061,659
17.0.....	117,751	612,206	246,785	27,605	96,413	1,100,760
18.0.....	117,751	627,309	246,785	27,605	96,413	1,115,863
19.0.....	117,751	627,309	246,785	27,605	107,783	1,127,233
20.0.....	117,751	635,818	246,785	27,605	107,783	1,135,742
21.0.....	124,745	635,818	246,785	27,605	107,783	1,142,736
22.0.....	124,745	635,818	246,785	27,605	118,698	1,153,651
23.0.....	124,745	635,818	246,785	27,605	118,698	1,158,948
24.0.....	127,207	637,477	246,785	27,605	118,698	1,163,068
All plants..	127,207	637,477	246,785	27,605	118,698	1,213,809

1/ Cost of storage for 1 year; includes depreciation and interest on investment based on estimated 1971-72 price levels.

2/ Includes South and East.

Note: See table 2 delineation of areas.

Table 9.--Port terminals: Capacity available for grain storage at indicated longrun cost levels, 65 percent average occupancy, by area and United States, fiscal 1971-72

Longrun cost per bushel (cents) <u>1/</u>	Storage capacity of plants in--					United States
	Gulf	West	Great Lakes	East		
	- - - - - <u>-1,000 bushels-</u> - - - - -					
Less than--						
11.0.....	13,188	13,428	32,866	--		59,482
12.0.....	46,726	31,620	42,943	17,395		138,684
13.0.....	46,726	31,620	42,943	17,395		138,684
14.0.....	46,726	31,620	78,990	17,395		174,731
15.0.....	46,726	31,620	78,990	17,395		174,731
16.0.....	64,912	34,204	93,567	17,395		210,078
17.0.....	64,912	49,780	93,567	25,458		233,717
18.0.....	64,912	49,780	93,567	25,458		233,717
19.0.....	77,400	49,780	109,816	25,458		262,454
20.0.....	93,675	49,780	129,959	25,458		298,872
21.0.....	93,675	49,780	129,959	38,143		311,557
22.0.....	93,675	49,780	129,959	38,143		311,557
23.0.....	93,675	49,780	135,112	38,143		316,710
24.0.....	93,675	58,133	135,112	38,143		325,063
25.0.....	93,675	58,133	135,112	38,143		325,063
26.0.....	93,675	58,133	135,112	38,143		325,063
27.0.....	93,675	58,133	156,316	38,143		346,267
28.0.....	93,675	58,133	156,316	38,143		346,267
29.0.....	93,675	58,133	156,316	38,143		346,267
All plants.....	98,110	59,874	156,316	43,181		357,481

1/ Cost of storage for 1 year; includes depreciation and interest on investment based on estimated 1971-72 price levels.

Note: See table 2 for delineation of areas.

Table 10.--Country facilities: Capacity available for storage and handling of grains at indicated shortrun cost levels, 65 percent average occupancy, by area and United States, fiscal 1971-72

Shortrun cost per bushel (cents) <u>1/</u>	Storage capacity of plants in--					
	North Plains	Mid- Plains	South Plains	West	Great Lakes	United States <u>2/</u>
	----- -1,000 bushels-----					
Less than--						
6.5.....	--	61,752	96,418	127,758	146,882	484,317
7.0.....	--	139,337	96,418	127,758	146,882	561,902
7.5.....	7,495	393,191	133,637	180,401	175,442	934,179
8.0.....	7,495	699,524	133,637	274,603	175,442	1,342,209
8.5.....	7,495	821,032	133,637	274,603	238,842	1,700,855
9.0.....	46,382	854,366	239,987	279,232	238,842	1,884,055
9.5.....	75,526	877,686	247,524	279,232	258,693	1,963,907
10.0.....	75,526	943,078	285,878	279,232	357,829	2,238,201
10.5.....	182,701	997,928	291,173	289,107	367,104	2,424,671
11.0.....	266,156	1,102,238	291,173	289,107	643,601	2,888,933
11.5.....	276,874	1,191,639	324,919	289,107	643,601	3,022,798
12.0.....	302,612	1,225,504	449,774	289,107	643,601	3,207,256
12.5.....	335,377	1,366,598	551,140	289,107	643,601	3,482,480
13.0.....	378,527	1,425,684	551,140	289,107	643,601	3,584,717
13.5.....	385,594	1,453,133	551,140	289,107	643,601	3,619,234
14.0.....	434,626	1,454,133	565,018	289,107	643,601	3,682,143
14.5.....	470,318	1,461,027	667,689	289,107	687,764	3,872,563
15.0.....	470,318	1,473,211	694,478	313,899	690,784	3,939,350
15.5.....	480,490	1,565,780	694,478	313,899	723,891	4,075,197
16.0.....	485,596	1,569,582	719,899	313,899	723,891	4,109,525
16.5.....	485,596	1,584,213	719,899	313,899	723,891	4,124,157
17.0.....	485,596	1,584,213	719,899	320,688	728,643	4,135,697
17.5.....	500,354	1,584,213	719,899	320,688	728,643	4,150,455
18.0.....	528,064	1,585,296	724,816	328,567	728,643	4,192,045
All plants.	570,850	1,689,192	869,325	371,241	798,847	4,647,567

1/ Cost of receiving by truck, storage for 1 year, and shipping by rail; excludes depreciation and interest on investment.

2/ Includes South and East.

Note: See table 2 for delineation of areas.

Table 11.--Inland terminals: Capacity available for storage and handling of grains at indicated shortrun cost levels, 65 percent average occupancy, by area and United States, fiscal 1971-72

Shortrun cost per bushel (cents) <u>1/</u>	Storage capacity of plants in--					
	North Plains	Mid- Plains	South Plains	West	Great Lakes	United States <u>2/</u>
	----- <u>1,000 bushels</u> -----					
Less than--						
5.5.....	18,521	28,921	53,617	--	5,913	106,972
6.0.....	71,218	288,955	53,617	10,431	5,913	430,134
6.5.....	87,081	316,577	74,067	20,457	5,913	504,094
7.0.....	96,407	316,577	74,067	20,457	69,712	577,220
7.5.....	96,407	343,585	74,067	20,457	69,712	604,229
8.0.....	98,869	354,821	89,263	20,457	69,712	633,122
8.5.....	98,869	359,223	89,263	20,457	83,356	651,169
9.0.....	98,869	442,834	89,263	20,457	86,953	738,376
9.5.....	98,869	479,300	89,263	20,457	86,953	774,843
10.0.....	98,869	500,497	89,263	20,457	86,953	796,040
10.5.....	104,348	543,754	191,241	20,457	86,953	946,754
11.0.....	104,348	545,743	191,241	20,457	97,868	959,658
11.5.....	104,348	553,995	191,241	20,457	97,868	967,910
12.0.....	104,348	605,060	191,241	20,457	97,868	1,024,271
12.5.....	104,348	616,332	191,241	20,457	118,698	1,056,374
13.0.....	104,348	616,332	191,241	20,457	118,698	1,056,374
13.5.....	104,348	616,332	239,930	20,457	118,698	1,105,067
14.0.....	104,348	616,332	239,930	20,457	118,698	1,105,067
14.5.....	104,348	616,332	239,930	20,457	118,698	1,147,434
15.0.....	110,177	616,332	239,930	20,457	118,698	1,158,117
15.5.....	110,177	616,332	246,785	20,457	118,698	1,164,972
16.0.....	110,177	630,125	245,785	20,457	118,698	1,178,764
All plants..	127,207	637,477	246,785	27,605	118,698	1,213,809

1/ Cost of receiving by rail, storage for 1 year, and shipping by rail; excludes depreciation and interest on investment.

2/ Includes South and East.

Note: See table 2 for delineation of areas.

Table 12.--Port terminals: Capacity available for storage and handling of grains at indicated shortrun cost levels, 65 percent average occupancy, by area and United States, fiscal 1971-72

Shortrun cost per bushel (cents) <u>1/</u>	Storage capacity of plants in--				
	Gulf	West	Great Lakes	East	United States
	----- <u>1,000 bushels</u> -----				
Less than--					
4.0.....	18,186	41,459	--	--	59,645
4.5.....	31,374	44,043	--	17,395	92,812
5.0.....	43,863	44,043	--	17,395	105,301
5.5.....	60,138	44,043	--	30,079	134,260
6.0.....	60,138	44,043	--	30,079	134,260
6.5.....	60,138	44,043	--	30,079	134,260
7.0.....	60,138	44,043	36,047	30,079	170,307
7.5.....	60,138	44,043	36,047	30,079	170,307
8.0.....	71,018	53,777	36,047	38,143	198,985
8.5.....	71,018	53,777	52,294	38,143	215,232
9.0.....	93,676	58,133	84,636	38,143	274,588
9.5.....	93,676	58,133	105,840	38,143	295,792
10.0.....	93,676	58,133	105,840	38,143	295,792
10.5.....	93,676	58,133	120,418	38,143	310,370
11.0.....	93,676	58,133	140,561	38,143	310,370
11.5.....	93,676	58,133	140,561	38,143	330,513
12.0.....	93,676	58,133	140,561	38,143	330,513
12.5.....	93,676	58,133	140,561	38,143	330,513
13.0.....	93,676	58,133	140,561	38,143	330,513
13.5.....	93,676	58,133	140,561	38,143	330,513
14.0.....	93,676	58,133	140,561	41,565	333,935
14.5.....	93,676	58,133	140,561	43,181	335,551
15.0.....	93,676	58,133	145,714	43,181	340,704
All plants.....	98,110	59,874	156,316	43,181	357,481

1/ Cost of receiving by rail, storage for 1 year, and shipping by water; excludes depreciation and interest on investment.

Note: See table 2 for delineation of areas.

Table 13.--Country facilities: Capacity available for grain storage at indicated shortrun cost levels, 65 percent average occupancy, by area and United States, fiscal 1971-72

Shortrun cost per bushel (cents) <u>1/</u>	Storage capacity of plants in--					
	North Plains	Mid- Plains	South Plains	West	Great Lakes	United States <u>2/</u>
	----- 1,000 bushels -----					
Less than--						
2.5.....	--	443,081	123,947	153,120	--	771,655
3.0.....	--	679,982	123,947	153,120	87,798	1,096,354
3.5.....	--	901,534	151,190	205,193	157,116	1,466,542
4.0.....	--	1,060,525	161,377	299,395	175,442	1,748,247
4.5.....	--	1,217,305	310,761	299,395	175,442	2,228,150
5.0.....	7,495	1,269,382	321,872	299,395	296,812	2,491,614
5.5.....	7,495	1,300,805	635,004	299,395	296,812	2,836,169
6.0.....	146,539	1,430,826	637,463	313,899	556,373	3,381,758
6.5.....	202,936	1,555,285	637,463	313,899	648,391	3,654,632
7.0.....	232,327	1,562,025	659,130	322,539	694,293	3,766,973
7.5.....	308,578	1,596,091	797,945	322,539	703,567	4,025,379
8.0.....	336,458	1,604,699	832,144	335,219	747,731	4,152,909
8.5.....	376,170	1,624,835	838,773	335,219	785,267	4,256,922
9.0.....	410,016	1,624,835	838,773	335,219	793,039	4,298,540
9.5.....	483,133	1,624,835	838,773	335,219	793,039	4,371,657
10.0.....	499,087	1,624,835	864,408	335,219	793,039	4,413,245
10.5.....	524,035	1,624,835	864,408	335,219	793,039	4,438,193
11.0.....	524,035	1,632,610	864,408	338,037	793,039	4,448,787
11.5.....	524,035	1,676,112	869,325	338,037	793,039	4,497,205
12.0.....	545,963	1,676,112	869,325	338,037	793,039	4,519,134
12.5.....	545,963	1,676,112	869,325	338,037	793,039	4,535,593
13.0.....	560,721	1,676,112	869,325	343,098	793,039	4,555,412
13.5.....	560,721	1,676,112	869,325	343,098	793,039	4,583,555
14.0.....	560,721	1,676,112	869,325	371,241	793,039	4,583,555
All plants..	570,850	1,689,192	869,325	371,241	798,847	4,647,567

1/ Cost of storage for 1 year; excludes depreciation and interest on investment.

2/ Includes South and East.

Note: See table 2 for delineation of areas.

Table 14.--Inland terminals: Capacity available for grain storage at indicated shortrun cost levels, 65 percent average occupancy, by area and United States, fiscal 1971-72

Shortrun cost per bushel (cents) <u>1/</u>	Storage capacity of plants in--					
	North Plains	Mid- Plains	South Plains	West	Great Lakes	United States <u>2/</u>
	----- <u>1,000 bushels</u> -----					
Less than--						
2.0.....	18,521	25,605	--	--	--	44,126
2.5.....	18,521	335,193	--	--	5,912	359,626
3.0.....	71,218	368,359	--	10,431	5,912	455,921
3.5.....	87,081	368,359	53,617	10,431	19,556	539,045
4.0.....	106,443	400,807	74,067	20,457	86,953	688,728
4.5.....	106,443	470,100	89,263	20,457	86,953	773,217
5.0.....	111,922	574,908	191,241	20,457	86,953	985,481
5.5.....	117,751	596,271	221,147	20,457	92,411	1,048,037
6.0.....	117,751	619,290	221,147	20,457	92,411	1,071,056
6.5.....	120,213	621,279	239,930	20,457	107,783	1,109,662
7.0.....	127,207	621,279	239,930	20,457	107,783	1,116,656
7.5.....	127,207	633,619	239,930	20,457	107,783	1,128,996
8.0.....	127,207	633,619	246,785	20,457	118,698	1,146,766
8.5.....	127,207	633,619	246,785	20,457	118,698	1,146,766
9.0.....	127,207	634,404	246,785	20,457	118,698	1,147,551
9.5.....	127,207	635,818	246,785	20,457	118,698	1,156,113
10.0.....	127,207	635,818	246,785	27,605	118,698	1,161,410
10.5.....	127,207	637,477	246,785	27,605	118,698	1,163,068
11.0.....	127,207	637,477	246,785	27,605	118,698	1,163,068
11.5.....	127,207	637,477	246,785	27,605	118,698	1,205,440
12.0.....	127,207	637,477	246,785	27,605	118,698	1,210,294
All plants..	127,207	637,477	246,785	27,605	118,698	1,213,809

1/ Cost of storing for 1 year; excludes depreciation and interest on investment.

2/ Includes South and East.

Note: See table 2 for delineation of areas.

Table 15.--Port terminals: Capacity available for grain storage at indicated shortrun cost levels, 65 percent average occupancy, by area and United States, fiscal 1971-72

Shortrun cost per bushel (cents) <u>1/</u>	Storage capacity of plants in--					United States
	Gulf	West	Great Lakes	East		
	- - - - - <u>1,000 bushels</u> - - - - -					
Less than--						
1.0.....	--	41,459	--	--		41,459
1.5.....	--	41,459	--	--		41,459
2.0.....	18,186	41,459	--	17,395		77,040
2.5.....	34,461	45,457	--	17,395		97,313
3.0.....	47,649	48,040	--	17,395		113,084
3.5.....	47,649	48,040	22,264	30,079		148,032
4.0.....	47,649	48,040	22,264	30,079		148,032
4.5.....	60,138	48,040	54,070	38,143		200,391
5.0.....	60,138	52,395	78,725	38,143		229,401
5.5.....	60,138	52,395	131,019	38,143		281,695
6.0.....	93,675	58,133	131,019	38,143		320,970
6.5.....	93,675	58,133	131,019	38,143		320,970
7.0.....	93,675	58,133	131,019	38,143		320,970
7.5.....	93,675	58,133	151,162	38,143		341,113
8.0.....	93,675	58,133	151,162	38,143		341,113
8.5.....	93,675	58,133	151,162	41,565		344,535
9.0.....	93,675	58,133	151,162	41,565		344,535
9.5.....	93,675	58,133	151,162	41,565		344,535
10.0.....	93,675	58,133	151,162	43,181		346,151
All plants.....	98,110	59,874	156,316	43,181		357,481

1/ Cost of storing for 1 year; excludes depreciation and interest on investment.

Note: See table 2 for delineation of areas.

Table 16.--All facilities: Weighted average cost per bushel for handling and storing grains, United States, fiscal 1971-72

Cost item	Received by--			Loadout by--			Storage
	Truck	Rail	Water	Truck	Rail	Water	
Cents							
<u>Fixed costs</u>							
Building & equipment:							
Depreciation <u>1/</u> .....	0.601	0.517	0.389	0.790	0.803	0.245	5.791
Insurance.....	.011	.011	.004	.028	.017	.005	.312
Taxes.....	.061	.065	.037	.195	.077	.029	1.371
Licenses & bonds.....	--	--	--	--	--	--	.068
Interest on invest- ment <u>2/</u> .....	.343	.310	.211	.545	.480	.147	6.046
Total fixed cost per bushel.....	1.016	.903	.641	1.558	1.377	.426	13.588
<u>Variable costs</u>							
Direct labor.....	.829	.969	.917	1.201	1.167	.475	.759
Administrative overhead:							
Electricity, heat, etc.:	.088	.061	.079	.146	.116	.033	.101
Truck expenses.....	.060	.008	.005	.107	.038	.005	--
Building repairs.....	.011	.005	.005	.006	.006	.005	1.140
Equipment repairs.....	.082	.064	.065	.172	.106	.040	.067
Insurance on grain.....	--	--	--	--	--	--	.205
Taxes on grain.....	--	--	--	--	--	--	.140
Fumigation.....	--	--	--	--	--	.036	.183
Other <u>3/</u> .....	.302	.289	.123	.460	.364	.167	.349
Interest on working capital <u>4/</u> .....	.022	.024	.014	.041	.033	.011	.070
Total variable cost per bushel.....	1.698	1.695	1.336	2.477	2.304	.889	3.331
Total cost per bushel....	2.714	2.598	1.977	4.035	3.681	1.315	16.919

1/ Calculations based on replacing building and equipment at 1971-72 construction costs and using standardized depreciation rates.

2/ Calculated at 7.0 percent of one-half of the 1971-72 replacement value of building and equipment.

3/ Includes such items as supplies, audit, legal, protective services, dues, subscriptions, travel, advertising, donations, etc.

4/ Calculated at 8.0 percent per annum, borrowed quarterly, of the total out-of-pocket cost.

Table 17.--Country facilities: Weighted average cost per bushel for handling and storing grains, United States, fiscal 1971-72

Cost item <u>1/</u>	Received by--		Loadout by--		Storage
	Truck	Rail <u>2/</u>	Truck	Rail	
	Cents				
<u>Fixed costs</u>					
Building & equipment:					
Depreciation.....	0.601	--	0.527	1.039	4.562
Insurance.....	.015	--	.019	.029	.346
Taxes.....	.075	--	.080	.113	1.014
Licenses & bonds.....	--	--	--	--	.122
Interest on investment....	.348	--	.292	.536	4.772
Total fixed cost per bushel.....	1.039	--	.918	1.717	10.816
<u>Variable costs</u>					
Direct labor.....	.830	--	1.076	1.153	.800
Administrative overhead...	.518	--	.353	.784	.474
Electricity, heat, etc. ..	.112	--	.159	.160	.099
Truck expenses.....	.122	--	.130	.111	--
Building repairs.....	.030	--	.007	.008	1.260
Equipment repairs.....	.085	--	.096	.162	.043
Insurance on grain.....	--	--	--	--	.268
Taxes on grain.....	--	--	--	--	.052
Fumigation.....	--	---	--	--	.204
Other.....	.356	--	.390	.636	.525
Interest on working capital.....	.028	--	.029	.041	.082
Total variable cost per bushel.....	2.081	--	2.240	3.055	3.807
Total cost per bushel.....	3.120	--	3.158	4.772	14.623

1/ See footnotes, table 16, for explanation of various cost items.

2/ Insufficient data.

Table 18.--Inland terminals: Weighted average cost per bushel for handling and storing grains, United States, fiscal 1971-72

Cost item <u>1/</u>	Received by--		Loadout by--		Storage
	Truck	Rail	Truck	Rail	
	Cents				
<u>Fixed costs</u>					
Building & equipment:					
Depreciation.....	0.689	0.534	0.780	0.527	6.558
Insurance.....	.013	.006	.024	.010	.298
Taxes.....	.072	.066	.115	.058	1.793
Licenses & bonds.....	--	--	--	--	.052
Interest on investment....	.403	.313	.470	.328	6.803
 Total fixed cost per bushel.....	 1.177	 .919	 1.389	 .923	 15.504
<u>Variable costs</u>					
Direct labor.....	.816	.957	1.168	.965	.838
Administrative overhead....	.297	.317	.358	.450	.299
Electricity, heat, etc. ...	.074	.056	.100	.108	.099
Truck expenses.....	.060	.010	.150	.021	--
Building repairs.....	.006	.005	.006	.005	.939
Equipment repairs.....	.062	.050	.173	.046	.055
Insurance on grain.....	--	--	--	--	.151
Taxes on grain.....	--	--	--	--	.250
Fumigation.....	--	--	--	--	.234
Other.....	.396	.241	.641	.367	.350
Interest on working capital.....	.023	.025	.046	.032	.078
 Total variable cost per bushel.....	 1.734	 1.661	 2.642	 1.994	 3.293
 Total cost per bushel.....	 2.911	 2.580	 4.031	 2.917	 18.797

1/ See footnotes, table 16, for explanation of various cost items.

Table 19.--Port terminals: Weighted average cost per bushel for handling and storing grains, United States, fiscal 1971-72

Cost item <u>1/</u>	Received by--			Loadout by--			Storage
	Truck	Rail	Water	Truck	Rail	Water	
	Cents						
<u>Fixed costs</u>							
Building & equipment:							
Depreciation.....	0.434	0.485	0.389	1.048	1.120	0.245	5.438
Insurance.....	.006	.019	.004	.046	.021	.005	.308
Taxes.....	.028	.062	.037	.453	.079	.029	.887
Licenses & bonds.....	--	--	--	--	--	--	.049
Interest on investment..	.223	.304	.211	.918	.721	.147	5.753
Total fixed cost per bushel.....	.691	.870	.641	2.465	1.941	.426	12.435
<u>Variable costs</u>							
Direct labor.....	.854	.991	.917	1.377	1.567	.475	.571
Administrative overhead..	.120	.193	.128	.309	.240	.117	.207
Electricity, heat, etc..	.094	.071	.079	.221	.089	.033	.105
Truck expenses.....	.004	.005	.005	.004	.005	.005	--
Building repairs.....	.005	.007	.005	.007	.007	.007	1.418
Equipment repairs.....	.120	.092	.065	.241	.168	.040	.111
Insurance on grain.....	--	--	--	--	--	--	.250
Taxes on grain.....	--	--	--	--	--	--	.010
Fumigation.....	--	--	--	--	--	.036	.065
Other.....	.073	.381	.123	.177	.113	.167	.188
Interest on working capital.....	.015	.023	.014	.044	.027	.011	.045
Total variable cost per bushel.....	1.285	1.763	1.336	2.380	2.216	.889	2.970
Total cost per bushel.....	1.976	2.633	1.977	4.845	4.157	1.315	15.405

1/ See footnotes, table 16, for explanation of various cost items.

Table 20.--Weighted average cost per bushel for handling and storing grains with 10 percent increase and decrease in volumes, by type of facility, United States, fiscal 1971-72 <sup>1/</sup>

Type of facility	Received by--			Loadout by--			Storage							
	Truck	Rail	Water	Truck	Rail	Water								
	Volume change of--													
	-10%	+10%	-10%	+10%	-10%	+10%	-10%							
	+10%	-10%	+10%	-10%	+10%	-10%	+10%							
	Cents													
Country elevators...	3.2	3.0	--	--	3.3	3.1	5.0	4.6	--	--	15.8	13.6		
Inland terminals.....	3.0	2.8	2.7	2.5	--	4.2	3.9	3.0	2.8	--	--	20.5	17.4	
Port terminals.....	2.1	1.9	2.7	2.6	2.0	1.9	5.1	4.4	4.0	1.4	1.3	16.8	14.3	
All facilities.....	2.8	2.6	2.7	2.5	2.0	1.9	4.2	3.9	3.8	3.6	1.4	1.3	18.4	15.7

<sup>1/</sup> Costs were developed from the data used for tables 16, 17, 18, and 19 with an increase and decrease of 10 percent in volumes received, shipped, and stored.

APPENDIX

Basis for Projecting 1967-68 Costs to 1971-72

The following percentage changes were used to calculate average grain handling and storage costs expected to prevail in 1971-72. These estimates were applied to the sample plants from which actual cost data were collected in the fall of 1968.

<u>Cost item</u>	<u>Estimated percentage increase from 1967-68</u>
<u>Fixed costs</u>	<u>Percent</u>
Building and equipment depreciation	30
Building and equipment insurance	30
Building and equipment taxes	25
Building and equipment interest on invested capital	40
<u>Variable costs</u>	
Direct labor	26
Administrative overhead	23
Electricity, heat, etc.	none
Building and equipment repairs	30
Insurance on grain	15
All other items	20

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