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Capital Investment Requirements for a 500, 1,000 and 10,000 Head Cattle Feedlot

Robert Allen

Myron Eighmy

David Jibben
South Dakota State University

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CAPITAL INVESTMENT REQUIREMENTS FOR A 500, 1,000 AND 10,000 HEAD CATTLE FEEDLOT

BY

HERBERT R. ALLEN, MYRON EIGHMY AND DAVID JIBBEN

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FORWARD

This study investigates the level of investment in feedlot equipment, buildings, concrete, feedlot construction materials, feed storage facilities and waste disposal for 3 sizes of feedlots. The research for this report was conducted under South Dakota Agricultural Experiment Station Project 674 "Enterprise Production Coefficients for Use With a Budget Generator."

The authors wish to express their appreciation for the helpful suggestions made by G. Robert Durland, Extension Agricultural Engineer and Louis Lubinus, Extension Agricultural Engineer, South Dakota State University, in reviewing the manuscript for this publication.

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SUMMARY AND CONCLUSIONS

Planning the construction and operation of a 500, 1,000, or 10,000 cattle feedlot includes such factors as: the number and size of individual pens, the amount of feed necessary and the cost of all construction.

Individual Pens

The size of the individual pen for the 500 and 10,000 cattle feedlots would be 150 feet by 250 feet, which would maintain 250 cattle. The size of the individual pen for the 1,000 cattle feedlot would expand to 150 feet by 335 feet, which would maintain 335 cattle. One lineal foot of space running the width of the pen (150 feet) would be required per head. Cross fencing would be necessary to subdivide each individual pen into smaller lots of no more than 150 cattle. Each individual pen would have three double waterers (four for the expanded 1,000 cattle feedlot pen), and would have several feed bunks along the inside fence line adjacent to the 30-foot feeding alley that separates each individual pen. Each individual pen would have to be constructed to provide adequate drainage away from the 30-foot feeding alley. A concrete floor measuring 40 feet by 250 feet would be constructed on either side of the feed bunks. (25 feet of its width would be in front of the feed bunks and 15 feet of its width would extend to cover one-half of the feeding alley.) As optional materials a pole building enclosing the concrete floor and completely paved feeding alleys might be added to each pen. (The cross fencing, mentioned earlier, is not included in the cost.) Some concrete flooring in front of the feed bunks is necessary if the pole building is not constructed, and costs may be reduced by taking the desired fraction of the area cemented as described above. The pole building would measure 40 feet by 250 feet and would preferably be constructed along the inside fence line with 15 feet of its width extending to cover one-half of the feeding alley.

The 500 cattle feedlot would consist of two individual pens; the 1,000 cattle feedlot would have three individual pens; and the 10,000 cattle feedlot would contain 40 individual pens.

Amount of Feed

To maintain 500 cattle on feed for a 360-day period, 24,120 bushels of number two corn, 1,620 tons of silage, 170 tons of alfalfa-brome hay and 2,250 bushels of soybean oil meal would be stored. For 1,000 cattle for a 360-day period, 3,240 tons of silage would be stored. For 1,000 cattle for a 180-day period, 24,120 bushels of number two corn, 170 tons of alfalfa-brome hay and 2,250 bushels of soybean oil meal would be stored. To feed 10,000 cattle for a 180-day period, 241,200 bushels of number two corn, 16,200 tons of silage, 1,700 tons of alfalfa-brome hay and 22,500 bushels of soybean oil meal would be stored.

Cost of Construction

The cost of building materials, construction labor, feeding equipment, storage equipment, and waste disposal excluding pole buildings for the 500 cattle feedlot would be $82,714.64, and with pole buildings $134,760.14. The total cost excluding pole buildings for the 1,000 cattle feedlot would be $141,131.86, and with pole buildings $245,715.56. The total cost excluding pole buildings for the 10,000 cattle feedlot would be $870,390.36, and with pole buildings $1,911,649.80.

Analysis

The relationship between the fixed capital investments for the 500, 1,000 and 10,000 cattle feedlots indicates greater cost efficiency as the feedlots grow in size. A comparison of the various fixed costs in constructing and equipping each feedlot indicates that the 10,000 cattle feedlot is the most economically efficient of the three considered. A breakdown of the six categories of fixed costs shows that pole buildings, waste disposal and

concrete flooring for the pole buildings increase at a constant rate in comparison to the number of cattle in each feedlot. The cost for feedlot equipment, feedlot building materials and feedlot storage equipment increase at a decreasing rate in comparison to the number of cattle in each feedlot. A comparison of the cost per head per year for each of the six categories of fixed costs bears out these facts. A comparison of the total cost per head per year for each feedlot illustrates that the 10,000 cattle feedlot is the most economically efficient of the three considered.

The total fixed cost per head per year amounts to $14.52 for the 500 cattle feedlot, $12.88 for the 1,000 cattle feedlot and $9.82 for the 10,000 cattle feedlot.

Capital Investment Requirements for a 500, 1,000, and 10,000 Head Cattle Feedlot

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Herbert R. Allen, Myron Eighmy, and David Jibben*

Purpose of the Study

The purpose of this study is to figure the fixed costs of constructing and equipping a 500, 1,000 or 10,000 cattle feedlot given certain assumptions and restrictions, and to analyze those costs in terms of economic efficiency. The fixed costs are divided into six areas of analysis: the equipment of the feedlot, the pole buildings, the concrete flooring for the pole buildings, the feedlot building materials, the feedlot storage equipment and the waste disposal.

Sources of Information

Sources of data for this study are area farms, the Farm Home Administration, the Soil Conservation Service, and the following Brookings area agri-business firms: Farm Home and Fleet, Stockman's Supply, Peavey Lumber Company, and the Farmer's Cooperative Elevator. Also included are several literature sources listed in the bibliography section.

Assumptions and Restrictions

The plan for the following feedlots do not include the cost of items that would vary significantly depending on the location and climate of the area in which the proposed feedlots would be built. Therefore, the cost of water lines, wells, electrical wiring, and excavations are not included. Most factors are particularly adaptable to the Upper Midwest where temperatures often fall below freezing.

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*Associate Professor of Economics, former graduate student, and Research Assistant, respectively.

In figuring the total cost of each lot, two prices have been given. One figure excludes the pole buildings to show that a significant amount can be saved if buildings are not required. The second figure is the total cost including pole buildings. Forty square feet of total building space has been allowed for each animal. A cost of $2.00 per square foot has been used to determine the cost of the building. Fifteen of the 40 square feet allotted for each animal is area contained in the feeding alley, as one-half of the feeding alley is covered by the pole building. Twenty-five square feet of building space per animal extends into the feeding area to provide livestock shelter. Construction costs for each feedlot are figured with additional labor for site construction, pole buildings, feedlot materials and the concrete flooring for the pole buildings. An average of 30% is added to the materials cost for construction labor.

The feeding program consists of number two corn, corn silage, alfalfa-brome hay and soybean oil meal. Minimum daily requirements and bulk quantities are listed. It is assumed that the hay would be stacked near the feedlots and no shelters would be utilized for hay storage. It is also assumed that the 500 and 1,000 cattle feedlots would have the feed produced by the feedlot operator on his own ranch or farm. Facilities have been provided to dry and store corn in bulk quantities for the 500 cattle feedlot to provide a 360-day feed supply. Facilities have also been provided to store silage in bulk quantities for the 500 and 1,000 cattle feedlots to provide a 360-day feed supply. However, facilities have only been provided to dry and store corn for the 1,000 cattle feedlot to provide a 180-day feed supply. The magnitude of the 10,000 cattle feedlot has led to the assumption that feed would be purchased biannually and storage has been provided for a 180-day period.

The cost of farm equipment to plant and harvest the feed is not included. The tractor which is used to power the feeding wagon also is not included. These have been excluded because custom hiring of work could lead to considerable savings in machinery costs. Since the 10,000 cattle feedlot has been assumed to buy its feed, a truck has been included to power the ensilmixer which is used to mix and feed the ration. The $8,000 figure for the truck is an approximate value and is not to be used as a bid price because the prices may vary from dealer to dealer. An attempt has been made to identify the manufacturer and model number when possible, so that prices can be periodically updated to current prices. All cost prices are based on 1974 figures.

No detailed study of waste disposal systems is included. Based on information from local contractors and agricultural engineers a cost of $3,125.00 is arrived at to construct a lagoon for each 500 head.

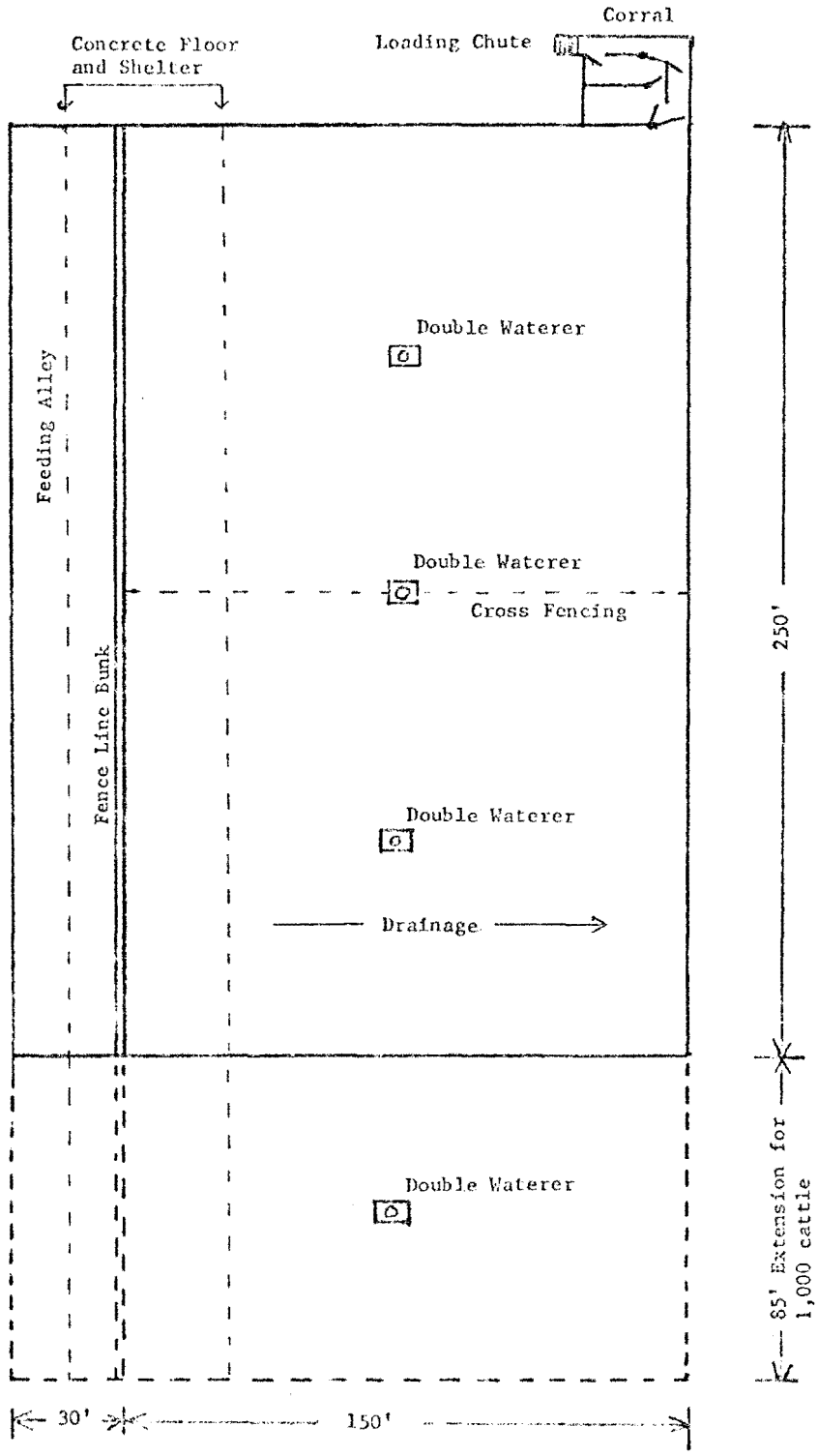
The basic feedlot pen is 150 feet by 250 or 335 feet. The feedlot pens are constructed in 150 foot widths, so that one foot of lineal lot space is required per head. While it is assumed that cross fencing will be used within each pen so that no more than 150 cattle will be maintained in an enclosed area, the cost of additional cross fencing materials is not included. All the feedlots are an expansion of the basic feedlot pen.

It is assumed that all concrete would be retained if the pole building is not constructed.

The Basic Feedlot Pen

The basic feedlot pen, which is diagrammed in Figure 1, would be 150 feet in width by 250 feet in length. The pen would be subdivided by cross fencing into at least two smaller pens each holding a maximum of 150 cattle. All cross fencing necessary for the feedlot pens is not included in the cost of construction. The pen would contain three double waterers. The basic pen would be expanded to 335 feet in length and equipped with four double waterers for the 1,000 cattle feedlot.

FIGURE 1. THE BASIC FEEDLOT PEN



Along the inside fence line (adjoined by a 30 foot feeding alley and another pen), a pole building might be constructed measuring 40 feet by 250 feet with 15 feet of its width extending to cover one-half of the feeding alley. Because some concrete flooring would be necessary around the feed bunks if the pole building were not constructed, the cost for all concrete flooring to cover the area enclosed by the pole building is included. The individual operator may reduce costs by utilizing concrete flooring only immediately around the feed bunks and can do so by taking the desired fraction of area cemented.

Several fence line bunks, mentioned earlier, would be constructed adjacent to the feeding alley along the inside fence line and adequate drainage away from the feed bunks and feeding alley would be necessary. Each feedlot would be equipped with a corral for sorting and handling cattle. Another optional feature in addition to the pole building might be completely paved feeding alleys. Fifteen feet of paved feeding alley is included for each pen.

The 500 Cattle Feedlot

The 500 cattle feedlot would consist of two feedlot pens as described in Figure 1.

Nutrition Requirements and Feeding Program

The minimum daily nutritional needs for fattening calves from 400 - 900 pounds is listed in Table 1 [1]. Based on those nutritional needs, a ration of corn, silage, hay and soybean oil meal is used to meet nutritional needs. It is listed in Table 2. It is also emphasized that the basic ration is employed in this analysis for the purpose of estimating feed quantities and storage requirements and not for the purpose of a recommended feeding program.

Feed Quantities

Table 3 lists the necessary quantities of corn, hay, silage, and soybean oil meal for a 360-day feed supply for 500 cattle. This supply is based on

Table 1. Dry Feed and Nutrient Requirements

Animal weight of fattening Calves	Dry Matter Pounds	Crude Protein Pounds	Digestible Protein Pounds	Total Digestible Nutrients, lbs.
400	10.8	1.3	1.10	8.0
500	11.5	1.5	1.20	9.5
600	14.5	1.8	1.32	11.0
700	16.2	1.9	1.46	12.4
800	18.0	2.0	1.60	13.5
900	19.0	2.1	1.73	14.5

[1] Source: James J. O'Connell, "Computing Cattle Rations"

Table 2. Feeding Program for Cattle: Average Compositon and Digestible Nutrients Per Head

Kind of Feed	Pounds Daily	Dry Matter Pounds	Crude Protein Pounds	Digestible Protein Pounds	Total Digestible Nutrients, lbs.
corn, no. 2	7.50	6.38	.65	.52	6.01
corn silage	18.00	4.97	.41	.22	3.29
alfalfa-brome hay	1.00	.89	.12	.08	.48
soybean oil meal	.75	.68	.33	.28	.58
daily total	27.25	12.92	1.51	1.08	10.36
minimum requirements		11.50	1.50	1.20	9.50
excesses		1.42	.01	----	.86
deficiencies		----	----	.12	----

Table 3. Bulk Minimum Requirements for 360 Days for 500 Cattle

Kind of Feed	Bushels	Cubic Feet	Tons
corn, no. 2	24,120	30,150	675
silage	----	----	1620
alfalfa-brome hay	----	22,500	170
soybean oil meal	2,250	2,812.5	67.5

the nutritional needs listed in Tables 1 and 2. It will require storage for 24,120 bushels of corn, 1,620 tons of silage, 170 tons of hay and 67.5 tons of soybean oil meal.

Necessary Materials and Equipment

In order to construct a 500 cattle feedlot various building materials and feeding equipment are needed. Table 4-a lists these items, their description, their quantity, and their separate and total price.

Table 4-b [2] gives a detailed breakdown of corn and soybean oil meal storage equipment and its cost.

A separate, detailed list of different silos and companion equipment is given in Table 4-c. The different sizes of silos listed in Table 4-c are used in the various feedlots according to the quantity of storage needed.

Waste Disposal

Manure lagoons would be used for waste disposal from each of the feedlots. The cost of one lagoon adequate in size for a 500 cattle herd would be $3,125.00.

Fixed Capital Investment

Table 5 lists a cost breakdown of the fixed capital requirements necessary to construct and equip a 500 cattle feedlot. The total investment including waste disposal, building materials, construction labor, feeding equipment, storage facilities, pole buildings, and concrete flooring for the pole buildings would be $134,760.14. If pole buildings for shelter were not included the investment would be reduced by $52,045.50. This investment in a pole building includes construction labor and all building materials, but excludes the cost of a concrete floor. It is assumed that all concrete would be retained if a shelter is not constructed.

Table 4-a. Equipment List for a 500 Cattle Feedlot

Item	Description	Quantity	Price Each	Total Each
Feedlot Equipment				
Double Waterers	Malor Inc. MFL-0 heated	6	$ 120.00	$ 720.00
Cattle Oilers		4	150.00	600.00
Mixer Wagon	Ensilmixer	1	7,800.00	7,800.00
Tractor Loader	John Deere, Model 148	1	1,500.00	1,500.00
Pole Buildings				
Nails, Pole Barn		50#	.70	35.00
Pole Building	40' by 250'	2	20,000.00	40,000.00
Concrete Floor	40' by 250'	247 yds.	22.80	5,631.60
Feedlot Materials				
Wooden Posts	4" top, 8' length	150	3.55	532.50
Lumber	2" by 6" by 16'	4.78 M	334/M	1,596.52
Concrete Bunks	bunks, cable and risers	500'	746/100'	3,730.00
Gates	12'	5	50.00	250.00
	10'	3	45.00	135.00
	6'	2	33.25	66.50
	4'	2	26.30	52.60
Bolts & Hardware	½" x 6" bolts & plates	600	.75	450.00
Head Gate/ Squeeze Chute	K & O	1	220.00	220.00
Loading Chute	W W brand	1	275.00	275.00
Feed Storage				
Silos	Yankton 24-70, 1702 T foundation, center fill goose, swing door, pipe bracket	2	13,035.00	26,070.00
Silo Unloader	10 hp, 85' cord, cable	2	3,596.00	7,192.00
Storage Bins	see Table 4-b			18,886.00
			TOTAL	$115,742.72

Table 4-b. Equipment List for the Corn and Soybean Oil Meal Storage Equipment for a 500 Cattle Feedlot

Item	Description	Quantity	Total
Dryer	LCD Batch Bin Dryer (4100 bu. cap) with 3 extra manholes and 9.3 horsepower fan with 2 million BTU and vaporizor	1	$ 3,542.00
Ladders	1' by 12'	1	
	1' by 8'	1	75.00
Tube and Hopper	Tube and Hopper with contr. rod	1	100.00
Bin Unloader	High speed bin unloader with 3 horsepower motor	1	465.00
Auger	Sweep auger with 1 horsepower motor	1	190.00
Grain Tanks	C-24-7 Grain tanks (7,405 bu. cap. each)	3	8,160.00
Tube and Hopper	Underfloor tube and hopper with cont. rod	3	306.00
Ladders	108 ft. side ladders @ $3.25	108'	351.00
Bin Unloader	High speed bin unloader with 3 horsepower motor	1	465.00
Auger	Sweep auger with 1 horsepower motor	1	190.00
Grain tank	C-18-4 Grain tank (2,420 bu. cap.)	1	987.00
Tube and Hopper	Tube and Hopper with cont. rod	1	95.00
Ladders	16 ft. side ladders @ $3.25	16'	52.00
Concrete	57 yds. of ready mix delivered	57 yds.	1,368.00
Remesh			150.00
Labor	concrete and steel labor		2,390.00
		TOTAL	$18,886.00

Table 4-c. Equipment List for Silage Storage

Item	Description	Total
Silo	24' - 70' Yankton silo	$11,515.00
Silo	foundation	660.00
Accessories	safety cage	306.00
	goose neck	189.00
	swing doors	140.00
	pipe and brackets	225.00
Silo Unloader	24' Yankton silo unloader	2,684.00
Silo Unloader	motor	646.00
Accessories	electric cable	178.50
	steel cable	87.50
Silo and Accessories	24' - 70' Appleton silo, which includes chute ladder, safety guard pipe dormer, 60' pipe and goose neck, digging and forming, platform, roof, dormer and 27 yds. of concrete	13,065.00
Silo and Accessories	30' - 70' Appleton silo includes all of the above and 30 yds. of concrete	20,915.00
Silo Unloader	24' Appleton unloader	3,414.00
Silo	motor	585.00
Unloader	steel cable	90.00
Accessories	electric cable	150.00
	installation	150.00
Silo Unloader	30' Appleton unloader	3,668.00
Silo Unloader	electrical cord	170.00
Accessories	steel cable	100.00
	motor	585.00
	installation	150.00

Table 5. Fixed Capital Investment in a 500 Cattle Feedlot

	Materials Cost	Cost Including Construction Labor	Years of Life	Cost per Year	Cost Per Head Per Year
Feedlot Equipment	$10,620.00	$10,620.00	10	$1,062.00	$2.12
Pole Building	40,035.00	52,045.50	20	2,602.28	5.20
Concrete for Pole Buildings	5,631.60	7,321.08	20	366.05	.73
Feedlot Materials	7,308.12	9,500.56	20	475.03	.95
Feedlot Storage Equipment	52,148.00	52,148.00	20	2,607.40	5.21
Waste Disposal	3,125.00	3,125.00	20	156.25	.31
Total	$118,867.72	$134,760.14		$7,269.01	$14.52

The 1,000 Cattle Feedlot

The 1,000 cattle feedlot would consist of three of the expanded feedlot pens as described in Figure 1.

Feed Quantities

Based on the same nutritional needs and the formulation of a basic ration given in Tables 1 and 2, the necessary quantities of corn, silage, hay and soybean oil meal are given in Table 6. Because corn, soybean oil meal and hay would be stored semi-annually space requirements for storage would be for 24,120 bushels of corn, 170 tons of hay and 2,250 bushels of soybean oil meal. To provide storage for a 360-day feed supply space is needed for 3,240 tons of silage.

Necessary Materials and Equipment

The various building materials and feeding equipment necessary to construct and equip a 1,000 cattle feedlot are given in Table 7-a. Because the corn and soybean oil meal for the 1,000 cattle feedlot would be stored semi-annually, the storage equipment necessary would be the same as that for the 500 cattle feedlot for a 360-day feed supply. Table 4-b lists the necessary storage equipment and its cost.

Waste Disposal

Manure lagoons would be used for waste disposal from each of the feedlots. The cost of two lagoons adequate in size for a 1,000 cattle herd would be $6,250.00.

Fixed Capital Investment

Table 8 lists a cost breakdown of the fixed capital requirements necessary to construct and equip a 1,000 cattle feedlot. The total investment including waste disposal, building materials, construction labor, feeding equipment storage facilities, pole buildings and concrete flooring

Table 6. Bulk Minimum Feed Requirements for 1,000 Cattle for 360 Days

Kind of Feed	Bushels	Cubic Feet	Tons
Corn, No. 2	48,240	60,300	1,350
Silage	----	----	3,240
Alfalfa-brome hay	----	45,000	340
Soybean oil meal	4,500	5,625	135

Table 7-a. Equipment List for a 1,000 Cattle Feedlot

Item	Description	Quantity	Each	Total
Feedlot Equipment				
Waterers, Double	Malor Inc. MF1-0 heated	12	$ 120.00	$ 1,440.00
Cattle Oilers		8	150.00	1,200.00
Mixer Wagon	Ensilmixer	1	7,800.00	7,800.00
Tractor Loader	John Deere Mod. 148	1	1,500.00	1,500.00
Pole Buildings				
Nails, Pole Barn		70#	.70	49.00
Pole Building	40' by 335'	3	26,800.00	80,400.00
Concrete Floor	40' by 335'	495 yds.	22.80	11,286.00
Feedlot Materials				
Wooden Posts	4" top, 8' length	210	3.55	745.50
Lumber	2" by 6" by 16'	8 M	334.00/M	2,672.00
Bunks, Concrete	bunks, cable, and risers	1000'	7.46/ft	7,460.00
Gates	18'	2	69.25	138.50
	16'	4	57.95	231.80
	14'	4	53.85	215.40
	12'	5	50.00	250.00
	10'	5	45.40	227.00
	6'	2	33.25	66.50
	4'	1	26.50	26.50
Bolts & Hardware	½" x 6" bolts & plates	840	.75	630.00
Head Gate/ Squeeze Chute	K & O Manuf. Co.	1	220.00	220.00
Loading Chute	W W brand	1	275.00	275.00
Feed Storage				
Silos	Appleton 24' by 70', chute, platform, ladder, safety guard, dormer, pipedormer, 60' pipe with goose neck, digging and forming and foundation	4	13,680.60	54,722.40
Unloaders	24' unloader, motor, steel cable, electrical cable, installation	4	4,389.00	17,556.00
Drying and Storage				18,886.00
			TOTAL	$207,997.60

Table 8. Fixed Capital Investment on a 1,000 Cattle Feedlot

	Materials Cost	Cost Including Construction Labor	Years of Life	Cost per Year	Cost per Head per Year
Feedlot Equipment	$11,940.00	$ 11,940.00	10	$1,194.00	$1.19
Pole Buildings	80,449.00	104,583.70	20	5,229.19	5.23
Concrete for Pole Buildings	11,286.00	14,671.80	20	733.59	.73
Feedlot Materials	13,158.20	17,105.66	20	855.28	.86
Feedlot Storage Equipment	91,164.40	91,164.40	20	4,558.22	4.56
Waste Disposal	6,250.00	6,250.00	20	312.50	.31
Total	$214,247.60	$245,715.56		$12,882.78	$12.88

for the pole buildings would be $245,715.56. If pole buildings for shelter were not included the investment would be reduced by $104,583.70. The investment in the pole building includes construction labor and all building materials, but excludes the cost of a concrete floor. It is assumed that all concrete would be retained if a shelter is not constructed.

The 10,000 Cattle Feedlot

The 10,000 cattle feedlot would consist of 40 of the basic feedlot pens described in Figure 1.

Feed Quantities

Based on the same nutritional needs and the formulation of a basic ration as given in Tables 1 and 2, the necessary quantities of corn, silage, hay, and soybean oil meal are given in Table 9. These quantities are sufficient for a 180-day period. It is assumed that as feedlots become larger it is not necessary to provide storage capacity for a 360-day feed supply.

Necessary Materials and Equipment

The various building materials and feeding equipment necessary to construct and equip a 10,000 cattle feedlot are given in Table 10-a.

Table 10-b [3] gives a detailed list of corn and soybean oil meal storage and equipment and its cost. Ten grain tanks with a capacity of 24,047 bu. each and one tank with a capacity of 24,047 bu. for soybean oil meal are required. A batch bin dryer is not included because a feedlot of this size will purchase large quantities of corn dried to proper moisture content.

Waste Disposal

Manure lagoons would be used for waste disposal from each of the feedlots. The cost of the 20 lagoons adequate in size for 10,000 head of cattle would be $62,500.00.

Fixed Capital Investment

Table 11 lists a cost breakdown of the fixed capital requirements necessary to construct and equip a 10,000 cattle feedlot. The total investment including waste disposal, building materials, construction labor, feeding equipment, storage facilities, pole buildings and concrete flooring for the pole buildings would be $1,911,649.80. If the pole buildings for shelter were not included the investment would be reduced by $1,041,259.44. The investment in the pole building includes construction labor and all building materials, but excludes the cost of a concrete floor. It is assumed that all concrete would be retained if a shelter is not constructed.

Table 9. Bulk Minimum Requirements for 10,000 Cattle for 180 Days

Kind of Feed	Bushels	Cubic Feet	Tons
Corn, No. 2	241,200	300,150	6,750
Silage	40,180	----	16,200
Alfalfa-brome hay	----	225,000	1,700
Soybean oil meal	22,500	28,125	675

Table 10-a. Equipment List for a 10,000 Cattle Feedlot

Item	Description	Quantity	Each	Total
Feedlot Equipment				
Waterers, Double	Malor Inc. MF1-0, heated	120	$ 120.00	$ 14,400.00
Cattle Oilers		120	150.00	18,000.00
Feed Mixer	Ensilmixer with electronic scale and magnet	1	10,640.00	10,640.00
Tractor Loader	John Deere Mod. 148	1	1,500.00	1,500.00
Truck	for Ensilmixer box	1	8,000.00	8,000.00
Pole Buildings				
Nails, Pole Barn		1384#	.70	968.80
Pole Building	40' by 250'	40	20,000.00	800,000.00
Concrete Floor	40' by 250'	4,950 yds.	22.80	112,860.00
Feedlot Materials				
Wooden Posts	4" top, 8' length	4150	3.55	14,732.50
Lumber	2" by 6" by 16'	68.4 M	334.00/M	22,845.60
Bunks, Concrete	bunks, cable and risers	10,000'	746/100'	74,600.00
Gates	16' steel	10	57.95	579.50
	12' steel	141	49.65	7,000.65
	6' steel	2	33.25	66.50
	4' steel	2	26.30	52.60
Bolts & Hardware	½" x 6" bolts & plates	16.6 M	$750/M	12,450.00
Head Gate/ Squeeze Chute	K & O Manuf. Co.	1	220.00	220.00
Loading Chute	W W Manuf. Co.	1	275.00	275.00
Feed Storage				
Silos (Appleton)	30' by 70' silo, with foundation, chute, platform, ladder, roof, dormer, safety guard, pipe guard, 60' pipe and goose, digging and forming	11	21,758.60	239,344.60
Silos (Appleton)	24' by 70' with all of the above	2	13,680.60	27,361.20
Silo Unloaders	24' with motor, steel cable and installation	2	4,389.00	8,778.00
	30' with all of the above	11	4,673.00	51,403.00
Corn Storage Bin	See Table 10-b			84,501.00
Soybean Storage Bin	See Table 10-b			8,845.50
Foundation	See Table 10-b			15,730.00
			TOTAL	$1,535,154.45

Table 10-b. Equipment List for the Corn and Soybean Oil Meal Storage for a 10,000 Cattle Feedlot

Item	Description	Quantity	Total
Grain tanks	C-30-15 Super tanks (24,047 bu. cap. each)	10	$ 80,380.00
Tube and Hoppers	Underfloor tube and hopper kit with cont. rods	10	1,150.00
Ladders	700' of ladders @ $3.25/ft.	700'	2,275.00
Bin Unloader	High speed bin unloader with 3 horsepower motor	1	465.00
Auger	Sweep auger with 1½ horsepower motor	1	231.00
Grain tank	C-30-15 Super tank (24,047 bu. cap.)	1	8,038.00
Tube and Hopper	Underfloor tube and hopper with cont. rods	1	115.00
Ladders	70' of ladders @ $3.25/ft.	70'	227.50
Bin Unloader	High speed bin unloader with 3 horsepower motor	1	465.00
Concrete	Ready mix delivered	275 yds.	6,600.00
Remesh			550.00
Labor	Concrete and steel labor		15,730.00
		TOTAL	$116,226.00

Table 11. Fixed Capital Investment in a 10,000 Cattle Feedlot

	Materials Cost	Cost Including Construction Labor	Years of Life	Cost Per Year	Cost per Head per Year
Feedlot Equipment	$ 52,540.00	$ 52,540.00	10	$ 5,254.00	$ .53
Pole Buildings	800,968.80	1,041,259.44	20	52,062.97	5.21
Concrete for Pole Buildings	112,860.00	146,718.00	20	7,335.90	.73
Feedlot Materials	132,822.35	172,669.06	20	8,633.45	.86
Feedlot Storage Equipment	435,963.30	435,963.30	20	21,798.18	2.18
Waste Disposal	62,500.00	62,500.00	20	3,125.00	.31
Total	$1,597,654.45	$1,911,649.80		$98,209.49	$9.82

An analysis of the fixed costs in constructing and equipping a 500, 1,000, or 10,000 cattle feedlot indicates that the 10,000 cattle feedlot is the most economically efficient of the three considered. Tables 5, 8, and 11 provide the basis for this analysis.

Of the six different areas of cost, the cost for pole buildings, concrete flooring for pole buildings, and waste disposal increases at a constant rate in comparison to an increase in the number of cattle in the feedlot. Hence, there is no efficiency to be gained in these areas by reducing or expanding the size of the feedlot.

However, the cost for feedlot equipment, feedlot building materials, and feed storage equipment increases at a decreasing rate in comparison with an increase in the number of cattle in the feedlot. Therefore, both the 1,000 and 10,000 cattle feedlots are more efficient economically than the 500 cattle feedlot.

The rate of increase reaches a relative minimum for the feedlot equipment and the feedlot building materials in the 1,000 cattle feedlot. The rate of increase for the feed storage equipment reaches a relative minimum in the 10,000 cattle feedlot.

Because the combined total of the feedlot equipment and feedlot building materials represents a much smaller percentage of fixed costs than feedlot storage equipment does, and because the minimum rate of increase is smaller for the feed storage equipment than the minimum rate of increase for the feedlot equipment and the feedlot building materials, the 10,000 cattle feedlot is the most economically efficient of the three considered.

Other factors, however, may play an important role in determining the level of investment that an individual may make in any given size of feedlot. Various strategies are available for a design of operation in cattle feeding. Decisions on the amount of storage capacity needed must be compatable with

decisions on when and how feed purchases will be made. If an operator produces all of his grain and hay, he may need storage capacity to hold his total feed production. This study assumes that feeding operations involving 500 cattle or less will require storage for the total feed requirements. However, a feedlot with more than 500 cattle on feed will undoubtedly make feed purchases periodically and will require less storage space. If feed is purchased at the proper moisture content for drying, it is not necessary to include the investment for a dryer.

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