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## Resource Requirements for Different Levels of Income on Faulk County, South Dakota Farms and Ranches

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October 1968

# RESOURCE REQUIREMENTS

for Different Levels of Income  
on Faulk County Farms and Ranches

Economics Department  
Agricultural Experiment Station  
South Dakota State University, Brookings

# CONTENTS

Highlights . . . . .	5
Introduction . . . . .	7
Present Agriculture. . . . .	8
Production Requirements. . . . .	9
Determination of Minimum Resources for Different Labor Incomes . . . . .	11
Changing Livestock Enterprises As It Affects Resource Requirements . . . . .	15
Changing Land Prices As It Affects Resource Requirements . . . . .	20
Implications for Adjustments . . . . .	23
Appendix . . . . .	25

## LIST OF TABLES

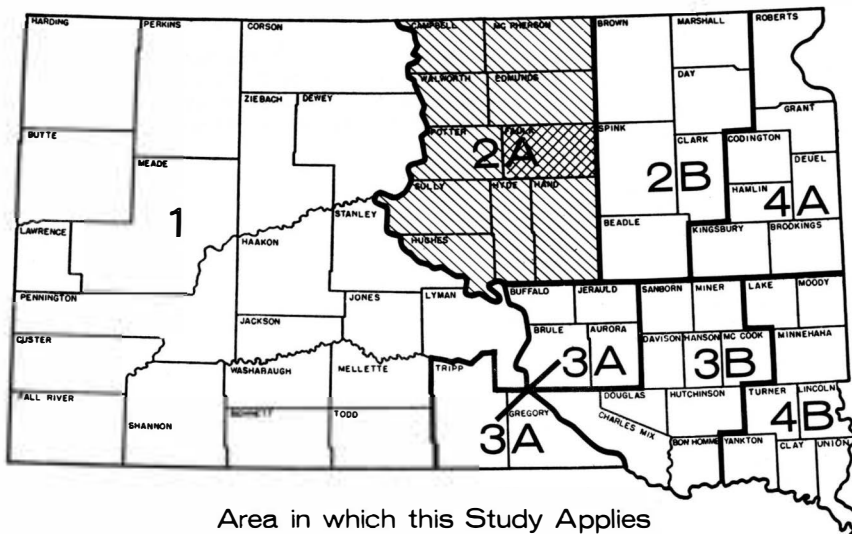
No.	Page
1. Assumed Average Prices Paid and Received by Farmers, Faulk County, South Dakota . . . . .	12
2. Land Use and Livestock as Programmed for Minimum Resource Requirements for Different Labor Incomes . . . . .	13
3. Financial Highlights of Programs for Minimum Resource Requirements for Different Labor Incomes . . . . .	13
4. Programmed Land Use and Livestock with Different Livestock Organizations for Minimum Resources to Earn \$3000 Labor Income (\$60 Land Price) . . . . .	16
5. Financial Highlights of Programming Minimum Resource Requirements to Earn \$3000 Labor Income with Different Livestock Organizations (\$60 Land Price) . . . . .	16
6. Programmed Land Use and Livestock with Different Livestock Organizations for Minimum Resources to Earn \$5000 Labor Income (\$60 Land Price) . . . . .	17
7. Financial Highlights of Programming Minimum Resource Requirements to Earn \$5000 Labor Income with Different Livestock Organizations (\$60 Land Price) . . . . .	17
8. Programmed Land Use and Livestock with Different Livestock Organizations for Minimum Resources to Earn \$3000 Labor Income (0 Land Price) . . . . .	18
9. Financial Highlights of Programming Minimum Resource Requirements to Earn \$3000 Labor Income with Different Livestock Organizations (0 Land Price) . . . . .	18
10. Programmed Land Use with Different Livestock Organizations for Minimum Resources to Earn \$5000 Labor Income (0 Land Price) . . . . .	19
11. Financial Highlights of Programming Minimum Resource Requirements to Earn \$5000 Labor Income with Different Livestock Organizations (0 Land Price) . . . . .	19
12. Programmed Land Use and Livestock with Different Land Prices and for Minimum Resource Requirements to Earn \$3000 Labor Return . . . . .	20
13. Financial Highlights of Programming Minimum Resource Requirements to Earn \$3000 Labor Returns with Different Land Prices . . . . .	21
14. Programmed Land Use and Livestock with Different Land Prices and for Minimum Resource Requirements to Earn \$5000 Labor Return . . . . .	21
15. Financial Highlights of Programming Minimum Resource Requirements to Earn \$5000 Labor Return with Different Land Prices . . . . .	22

List of Tables Cont.)

No.	Page
16. Programmed Land Use and Livestock with Different Land Prices and for Minimum Resource Requirements to Earn \$10,000 Labor Return. . . . .	22
17. Financial Highlights of Programing Minimum Resource Requirements to Earn \$10,000 Labor Return with Different Land Prices . . . . .	23

## HIGHLIGHTS

The purpose of this study was to determine the minimum resources (land, labor, cash or credit) required to earn \$3,000, \$5,000 or \$10,000 annual labor income in Faulk and nearby counties with comparable land.



Linear programming determined that some or all of the following crops should be included in the most profitable plans: corn, wheat, oats, flax, corn silage and alfalfa.

Fattening of purchased feeder calves was determined to be the most profitable enterprise. However, few ranchers include this enterprise, perhaps because of high risk. If a rancher restricts himself to a beef cow herd he would require 6,000 acres additional land to net the same income. If he neither buys calves or stockers for fattening nor raises hogs he will need 1,600 acres more land. If he doesn't buy calves or stockers for fattening he will need over 300 acres more land.

Changing land values as they affect the acres required to earn various levels of labor income are as follows:

For \$3,000 --  
\$0 per acre land requires 578 acres;  
\$30 per acre land requires 728 acres;  
\$60 per acre land requires 1,016 acres;  
\$75 per acre land requires 1,370 acres.

For \$5,000 --  
\$0 per acre land requires 836 acres;  
\$30 per acre land requires 1,001 acres;  
\$60 per acre land requires 1,613 acres;  
\$75 per acre land requires 2,279 acres.

For \$10,000 --  
\$0 per acre land requires 1,564 acres;  
\$30 per acre land requires 2,131 acres;  
\$60 per acre land requires 3,280 acres;  
\$75 per acre land requires 4,843 acres.

# RESOURCES REQUIRED FOR DIFFERENT LEVELS OF INCOME ON FAULK COUNTY, SOUTH DAKOTA FARMS AND RANCHES

Dwaine E. Umberger and Rex D. Helfinstine<sup>1 2 3</sup>

Most farmers and ranchers in Faulk County, as well as in other counties, are interested in learning the minimum amount of resources (land, labor and cash or credit) needed to earn different incomes. This bulletin presents the results and implications of comprehensive and speedy linear programming work that determined the minimum resources required by a farmer or rancher to earn a labor income of \$3,000, or \$5,000 or \$10,000 per year in Faulk County. Later reports are planned to present the results of similar work for other areas of South Dakota.

Faulk County is a transition area between farms and ranches with each being interspersed with the other. Accordingly, the term ranch as used later, will refer to either farm or ranch.

Current developments in electronic computing allow us to readily compute the best way to organize given ranch resources for the highest profit or, alternatively, the minimum resources to earn a given income. Linear programming as a technique for solving ranch management problems means adaptation of electronic data processing to the budgeting process long used in solving ranch management problems. Both the computer and budgeting process involve trial and error methods of comparing alternatives to find the best plan. However, the speed of electronic data processing allows comparison of almost unlimited alternatives rather than just for a few as in budgeting. This means greater assurance of obtaining the most profitable alternative.

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<sup>2</sup>Umberger, Dwaine Edward, "Minimum Resource Requirements for Specified Levels of Income in Faulk County, South Dakota," South Dakota State University M.S. thesis, 1967.

<sup>3</sup>Special acknowledgment is given to Professors John T. Sanderson and Wallace G. Aanderud of the Economics Department for advice and guidance on this study.



Linear programming requires a more precise mathematical statement of all requirements. Both methods require the same type of basic figures - labor, equipment, capital requirements for each enterprise, and production rates for each crop and livestock enterprise.

## PRESENT AGRICULTURE

Faulk County, the specific area under study, is located in State Economic Area 2A (figure 1). This area includes Campbell, Edmunds, Faulk, Hand, Hughes, Hyde, McPherson, Potter, Sully, and Walworth Counties. Results of the study apply specifically to Faulk County, but may apply in a general way to other counties with similar soils and resources.

### Present Farming

Major crops grown in Faulk County include wheat, oats, corn, and alfalfa. Land considered not suited for cultivation is used for native hay and pasture. Types of ranches range from primarily livestock to cash-grain, depending upon the relative proportion of cropland and preference of the operator.

Feeder cattle raising has been the chief livestock enterprise since it adapts itself to using both the native pasture and hay. Feed grains are used by some ranchers for fattening cattle or raising hogs or sheep.

The average size of ranch in Faulk County has been increasing since the 1930's. This may reflect the pressure to compensate for declining profits per unit from higher fixed investment in equipment. Higher fixed investment in equipment has arisen from substitution of equipment for labor as encouraged by improved technology and high labor costs. Ranchers find that unit costs may be reduced and total profits increased by enlarging their ranches. Changes in number of farms (ranches) and average size of farms in Faulk County are illustrated by the following U.S. Census figures:

Census Year	Number of Farms	Average size, acres
1890	--	237
1900	--	660
1910	--	476
1920	--	586
1930	--	575
1940	302	709
1950	766	734
1959	602	1005
1964	528	1138

## Soils

Faulk County lies on an undulating glacial plain that becomes less undulating from west to east. <sup>4</sup> Claypan and poorly drained soils are found more frequently toward the western part of the County. This situation means that the proportion of cropland decreases as one travels from east to west.

Soil fertility on cropland, although generally adequate, may need replenishment with nitrogen fertilizer and organic matter. A few areas have a water erosion problem arising from slope and character of the soil.

## Climate

Extreme change characterizes the weather in Faulk County. Temperatures have ranged from 20° to 40° below zero in winter to more than 100° in July and August. Winds up to 60 miles an hour are not uncommon. Hailstorms may wipe out a crop in minutes. At Faulkton, the county seat, 102 hailstorms of varying intensities have occurred in the 56-year period 1900 - 1956. Annual precipitation at the Faulkton weather station has averaged nearly 18 inches for the past 45 years. But the extreme variation in annual precipitation -- from 10 to more than 27 inches -- results in similar variation in crop yields.

## PRODUCTION REQUIREMENTS

Determination of minimum ranch resources required to earn given income levels by linear programming necessitates that production and cost requirements for crops and livestock be mathematically specified. Assumptions, which are required to be made, may not describe precisely any one ranch in Faulk County. However, the physical and financial results from using such assumptions should be useful for indicating the level of profitability from alternative ranching systems.

## Land

It was assumed that each acre of land was typical of Faulk County. This assumption allows one to determine the minimum acres of land required for different levels of living and use of the size ranch so determined for programming minimum

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<sup>4</sup>For more details see: Fred C. Westin et al, "Soils of South Dakota", Soil Survey Series Pamphlet No. 3, Agronomy Department, (Revised July 1967), South Dakota State University, Brookings, South Dakota, 1959.

other resources. Each acre was assumed to be made up as follows:<sup>5</sup>

Cropland	43.4%
Class a (most favorable)	(10.4)
Class b (Subject to erosion)	(20.9)
Class c (Unfavorable soil conditions)	( 9.5)
Class d (Excess water problems)	( 2.6)
Native hay and pasture	12.5%
Range	39.8%
Other	4.3%
TOTAL	100.0%

## Crops

Recommended cropping practices were assumed to be followed on the ranches under study. Average yields under this assumption were estimated by South Dakota State University agronomists for the average acre of crop land planted in Faulk County as follows:

Corn, bu.	23.7
Corn silage, T.	4.5
Oats, bu.	36.2
Barley, bu.	25.1
Wheat on cropland, bu.	16.1
Wheat on fallow, bu.	17.5
Flax, bu.	9.7
Alfalfa Hay, ton	1.3
Native Hay, ton	0.67
Native pasture, A.U.M.	0.55.

Other assumed figures and additional details for crops on average prices paid and received, costs of machinery and equipment, overhead costs and labor requirements are presented in appendix tables A-1, A-2, A-3 and A-4.

Crop enterprises considered in the analysis included wheat, corn grain, corn silage, oats, flax, barley and alfalfa hay. These crops were considered in rotations practiced in the area and recommended by agronomists at South Dakota State University. Continuous one-crop systems were not considered since they are not recommended nor practiced to any extent.

## Livestock

Livestock enterprises considered included 11 different beef cattle or calf systems and one hog system. A 92% calf crop was assumed for the cow-calf enterprise with one-sixth of the cows replaced annually. Average annual sales were one-sixth of a 1,000-pound cull cow and 76% of a 430-pound calf, with calves weaned the latter part of October.

<sup>5</sup>South Dakota Conservation Needs Committee, South Dakota Soil and Water Conservation Needs Inventory, May 1962.

Other livestock enterprises included feeding steer calves on alternative rations and weights for different lengths of time. A stocker enterprise wintered 430-pound calves on a ration of either silage or grain plus hay, followed by pasturing to a 700-pound weight in late summer. Four calf feeding systems involved obtaining 430-pound steer calves in October, wintering and feeding in drylot with or without silage to a 1,050-pound choice grade the following October. An alternative involved pasturing for 3 months and marketing as a 1,100 pound choice steer.

The hog enterprise included a gilt with 7.5 pigs weaned per litter, pigs farrowed in the spring and sold as 225-pound market hogs in the fall, with one gilt retained for replacement.

Further assumptions on costs, prices and production are given in appendix tables A-1, A-9, A-10, and A-11.

#### Basis of Analysis

Estimated future prices and costs used in the analysis are basic to the results one obtains. Those used in this study represent an estimate of future prices and are considered to be internally consistent.

Prices paid and received by ranchers in Faulk County were assumed to be as given in table 1.

### DETERMINATION OF MINIMUM RESOURCES FOR DIFFERENT LABOR INCOMES

Land in Faulk County was considered to be the most limiting resource since ranchers have little opportunity to rent or buy additional land at prevailing prices. Accordingly the programming was set up to minimize land requirements but allow labor and capital to be used up to the level where returns equal costs. Important factors other than land in determining minimum resources required by a typical Faulk County rancher for earning labor incomes of \$3,000, \$5,000 or \$10,000 include income goals, level of management, production rates, available labor, costs and prices, and availability of other resources.<sup>6</sup>

Important assumptions in the analysis include:

1. Operators desire maximum labor income.
2. Labor supply: operator furnishes up to 3,000 man-hours per year, additional labor may be hired at \$1.25 per hour.

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<sup>6</sup>Labor income is defined as residual returns for operator labor and management after market rates have been paid for all other resources.

3. Managerial ability: adequate to allow adoption of improved practices.
4. Resource ownership: all assets, including land, machinery, equipment and livestock are fully owned with no rent or interest paid out.
5. Wheat acreage limited to county average allotments.

### For Various Income Levels

Minimum resources required to earn \$3,000 labor income are indicated in tables 2 and 3. Land requirements are 1,016 acres; labor requirements 3,122 hours; and total capital requirements \$100,136. A labor income of \$3,000 required an annual gross income of \$34,109. The most profitable source of income, representing 91% of gross sales, was from feeding purchased calves.

Minimum resources for earning \$5,000 labor income are likewise shown in tables 2 and 3. Land requirements come to 1,613 acres; labor requirements to 4,269 hours; and capital requirements to \$155,546. This labor income of \$5,000 required an annual gross income of \$54,320 with 90% of gross sales accounted for by fat cattle.

Table 1. Assumed Average Prices Paid and Received by Farmers, Faulk County, South Dakota

Item	Unit	Price
		(Dollars)
<u>Prices Paid:</u>		
Livestock:		
Yearling steer purchased (April)	cwt.	23.26
Yearling feeder steer bought (October)	cwt.	23.08
Steer Calf bought (October)	cwt.	25.28
Gilt (breeding Stock)	unit	60.00
<u>Prices Received:</u>		
Crop products:		
Wheat	bu.	1.82
Oats	bu.	.53
Barley	bu.	.81
Flax	bu.	2.75
Corn	bu.	1.09
Livestock products:		
Choice steer sold (October)	cwt.	24.15
Choice steer sold (April)	cwt.	23.97
Yearling Stocker steer (October)	cwt.	23.08
Steer calf (October)	cwt.	25.28
Cull cow	cwt.	13.04
Market sows (farrowed once)	unit	54.57
Butcher hogs (late spring litter)	cwt.	15.82

Minimum resources necessary for earning a \$10,000 labor income are tabulated in tables 2 and 3. For this return 3,180 acres of land, 7,146 hours of labor and \$298,651 are required. This labor income required a \$98,766 gross income of which 80% was derived from fat cattle sales, 7% from hogs and 13% from wheat and flax sales.

Table 2. Land Use and Livestock as Programmed For Minimum Resource Requirements for Different Labor Incomes

	Level of Labor Income		
	\$3,000	\$5,000	\$10,000
Corn, acres	166	264	528
Oats, acres	106	168	224
Barley, acres	0	0	0
Wheat, acres	78	124	370
Flax, acres	25	39	80
Corn silage, acres	9	15	4
Alfalfa, acres	49	77	213
Fallow	9	14	5
Total, crop acres	442	701	1424
Native hay, acres	75	119	179
Rangeland, acres	464	738	1441
Other, acres	35	55	136
Total, all land, acres	1016	1613	3180
Feed calves, drylot, head	36	58	16
Feed calves, pasture, head	83	131	279
Gilt and litter, litters	0	0	21

Table 3. Financial Highlights of Programs for Minimum Resource Requirements for Different Labor Incomes

	Level of Labor Income		
	\$3,000	\$5,000	\$10,000
Investment			
Land and Buildings, dol.	64,044	101,637	206,742
Machinery and Equipment, dol.	11,640	14,732	19,621
Operating capital, dol.	24,452	39,177	72,288
Total capital, dol.	100,136	155,546	298,651
Income and Expenses			
Gross Income, dol.	34,109	54,320	98,766
Expenses, dol. <sup>a</sup>	25,583	40,039	71,925
Land charges, dol. <sup>b</sup>	3,352	5,323	10,824
Machinery costs, dol.	3,246	3,958	6,017
Labor Income, dol.	3,000	5,000	10,000

<sup>a</sup> Includes operating and overhead expenses with 7% interest on capital

<sup>b</sup> Assumes land value of \$60 per acre and 5.5% interest charge. Land charges and other interest charges are available for living expenses.

## General Considerations

The most profitable cropping plans for the different income levels included all crops considered except barley. A small change in resource requirements, yield relationships, or prices, would allow barley to replace oats.

Specific cropping plans varied with land class and income level. Class "a" cropland had corn-wheat and corn silage-wheat rotations for the three income levels. Class "b" cropland rotations included corn-oats for the \$3,000 and \$5,000 levels, and corn-oats and corn-wheat for the \$10,000 level.

Class "c" cropland rotation included wheat-corn-flax and 3 years of alfalfa for the three income levels. The rotation on class "d" cropland included flax-wheat-fallow for all three levels. The wheat allotment restriction, representing the average allotment for the County, proved to be a restriction only at the \$10,000 income level. Other resources could be used more advantageously in alternate enterprises.

Labor requirements varied seasonally according to crop planting, cultivating and harvesting requirements. Operator labor was considered available by periods as follows:

1. November 16 to March 15 -	508 hours
2. March 16 to April 30 -	210 hours
3. May 1 to July 15 -	493 hours
4. July 16 to September 30 -	583 hours
5. October 1 to November 15 -	306 hours.

It was profitable to hire additional labor during period 2 and 3 at the three income levels. In addition it was profitable to hire labor at higher income levels in other labor periods. The number of hours of labor to be hired during the different periods was as follows:

<u>Period</u>	<u>Income Level</u>		
	<u>\$3,000</u>	<u>\$5,000</u>	<u>\$10,000</u>
1. November 16 - March 15	0	0	
2. March 16 - April 30	128	320	793
3. May 1 - July 15	229	654	1676
4. July 16 - September 30	0	271	929
5. October 1 - November 15	0	116	547
TOTAL	357	1361	4095

Appendix table A-6 presents crop labor requirements and seasonal distribution.

## Changing Livestock Enterprises As It Affects Resource Requirements

Previous programming results indicated generally that the most profitable ranch organization included the fattening of purchased feeder calves. However, few Faulk County ranchers fatten purchased feeder calves, according to a recent survey of a group of 40 ranchers in the county. Perhaps the explanation lies in the risks associated with cattle feeding. Either or both crop production and prices fluctuate from year-to-year resulting in unpredictable high, low or intermediate income. Large amounts of capital or credit are required to be available to an operator if he is to continue in business.

Many operators in Faulk County apparently tried to diversify their enterprises in order to reduce risk. The effects of likely changes in livestock enterprises upon minimum resources and net incomes were examined.

Three different organizations were programmed:

1. An organization not allowing the purchase of feeder calves nor stockers (B);
2. An organization not allowing the purchasing of feeder calves nor stockers nor hog raising (C);
3. An organization allowing only a beef cow herd as a livestock enterprise (D).

Programming results to attain a \$3,000 labor return for these different organizations, assuming a \$60 land price, are presented in tables 4 and 5. Land requirements increase from 1,016 acres for the basic organization to 1,349 for B, to 2,604 for C and to 6,109 for D. Total capital requirements increase from \$100,136 for the basic organization to \$133,358 for B, to \$217,451 for C, and to \$494,113 for D.

Implications of these results for Faulk County ranchers are important. If a rancher decides he will not buy calves or stockers for fattening (B), he will need approximately a half section more land to make the same \$3,000 income. If he decides he will neither buy calves or stockers for fattening nor raise hogs (C), he will need an additional 1,600 acres. On the other hand, if only a beef cow herd will be kept (D), more than 6,000 additional acres will be required to make \$3,000 net labor income. The cost of restricting the enterprises a rancher will consider is readily apparent.

Similar results and implications are apparent in programming minimum resources for a \$5,000 income (Tables 6 and 7). Land requirements (\$60 land) increase from 1,613 acres for the basic organization to 2,246 acres for B, to 4,760



for C. to 11,164 for D. Increases in land requirements when enterprise choices are restricted are apparent.

Programmed results for \$3,000 and \$5,000 labor incomes are presented in tables 8, 9, 10 and 11.

Table 4. Programmed Land Use and Livestock with Different Livestock Organizations for Minimum Resources to Earn \$3,000 Labor Income (\$60 Land Price)

	Basic	Livestock Organization		D <sup>3</sup>
		B <sup>1</sup>	C <sup>2</sup>	
Corn, acres	166	243	308	721
Oats, acres	106	141	-	305
Barley, acres	0	0	130	0
Wheat, acres	78	103	294	690
Flax, acres	25	34	158	371
Corn silage, acres	9	-	-	-
Alfalfa, acres	49	64	124	292
Fallow	9	1	117	274
Total, crop acres	442	586	1,131	2,653
Native hay, acres	75	79	124	289
Rangeland, acres	464	627	1,238	2,907
Other, acres	35	57	111	260
Total, all land, acres	1,016	1,349	2,604	6,109
Beef cow and calf, head	0	34	67	204
Feed calves: drylot, silage, head	36	0	0	0
Feed calves: pasture, no silage, head	83	26	51	0
Gilt and litter, litters	0	50	0	0

Table 5. Financial Highlights of Programming Minimum Resource Requirements to Earn \$3,000 Labor Income with Different Livestock Organizations (\$60 Land Price)

	Basic	Livestock Organization		D <sup>3</sup>
		B <sup>1</sup>	C <sup>2</sup>	
Investment				
Land and Buildings, dol.	64,044	86,943	160,201	374,606
Machinery and Equipment, dol.	11,640	15,002	18,154	32,028
Operating capital, dol.	24,452	31,413	39,096	88,479
Total capital, dol.	100,136	133,358	217,451	494,113
Income and Expenses				
Gross Income, dol.	34,109	26,911	47,173	79,804
Expenses, dol.	25,583	14,462	30,634	47,640
Land charges, dol.	3,352	4,452	8,593	20,158
Machinery Costs, dol.	3,246	3,651	4,946	9,006
Labor Income, dol.	3,000	3,000	3,000	3,000

<sup>1</sup> Livestock organization not allowing the purchase of feeder calves or stockers.

<sup>2</sup> Livestock organization not allowing the purchase of feeder calves or stockers nor hog raising.

<sup>3</sup> Livestock organization allowing only a beef cow herd as a livestock enterprise.

Table 6. Programmed Land Use and Livestock with Different Livestock Organizations for Minimum Resources to Earn \$5,000 Labor Income (\$60 Land Price)

	Basic	Livestock Organization		
		B <sup>1</sup>	C <sup>2</sup>	D <sup>3</sup>
Corn, acres	264	388	562	1,319
Oats, acres	168	235	238	558
Barley, acres	0	0	0	0
Wheat, acres	124	173	539	1,262
Flax, acres	39	58	289	678
Corn silage, acres	15	-	-	-
Alfalfa, acres	77	107	227	533
Fallow	14	15	214	501
Total, crop acres	701	976	2,069	4,851
Native hay, acres	119	129	227	529
Rangeland, acres	738	1,059	2,471	5,812
Other, acres	55	97	205	480
Total, all land, acres	1,613	2,246	4,760	11,164
Beef cow and calf, head	0	57	123	372
Feed calves: drylot, silage, head	50	0	0	0
Feed calves: pasture, no silage, head	131	43	93	0
Gilt and litter, litters	0	110	0	0

Table 7. Financial Highlights of Programming Minimum Resource Requirements to Earn \$5,000 Labor Income with Different Livestock Organizations (\$60 Land Price)

	Basic	Livestock Organization		
		B <sup>1</sup>	C <sup>2</sup>	D <sup>3</sup>
<b>Investment</b>				
Land and Buildings, dol.	101,637	146,928	292,854	684,597
Machinery and Equipment, dol.	14,732	16,378	27,920	49,480
Operating capital, dol.	39,177	61,632	73,630	163,888
Total capital, dol.	155,546	224,938	394,404	897,965
<b>Income and Expenses</b>				
Gross Income, dol.	54,320	52,259	67,740	145,862
Expenses, dol.	40,039	35,095	39,648	89,496
Land charges, dol.	5,323	7,412	15,706	36,841
Machinery Costs, dol.	3,958	4,752	7,386	14,525
Labor Income, dol.	5,000	5,000	5,000	5,000

<sup>1</sup> Livestock organization not allowing the purchase of feeder calves or stockers.

<sup>2</sup> Livestock organization not allowing the purchase of feeder calves or stockers nor hog raising.

<sup>3</sup> Livestock organization allowing only a beef cow herd as a livestock enterprise.

Table 8. Programmed Land Use and Livestock with Different Livestock Organizations for Minimum Resources to Earn \$3,000 Labor Income (0 Land Price)

	Basic	Livestock Organization		
		B <sup>1</sup>	C <sup>2</sup>	D <sup>3</sup>
Corn, acres	100	105	150	162
Oats, acres	91	95	59	64
Barley, acres	9	0	0	0
Wheat, acres	4	15	98	106
Flax, acres	4	15	21	23
Corn silage, acres	0	-	-	-
Alfalfa, acres	28	29	41	45
Fallow	15	5	8	8
Total, crop acres	251	264	377	408
Native hay, acres	66	39	59	45
Rangeland, acres	251	283	404	456
Other, acres	10	21	29	32
Total, all land, acres	578	607	869	941
Beef cow and calf, head	0	15	28	32
Feed calves: drylot, no silage, head	41	0	21	0
Feed calves: pasture, no silage, head	42	12	0	0
Gilt and litter, litters	0	37	0	0

Table 9. Financial Highlights of Programming Minimum Resource Requirements to Earn \$3,000 Labor Income with Different Livestock Organizations (0 Land Price)

	Basic	Livestock Organization		
		B <sup>1</sup>	C <sup>2</sup>	D <sup>3</sup>
Investment				
Land and Buildings, dol.	2,133	36,420	52,140	54,460
Machinery and Equipment, dol.	9,260	11,185	11,310	11,230
Operating capital, dol.	15,431	17,373	14,961	12,896
Total capital, dol.	26,829	68,843	80,058	81,851
Income and Expenses				
Gross Income, dol.	21,940	14,656	13,589	12,911
Expenses, dol.	17,204	8,998	7,526	6,758
Land charges, dol.	0	0	0	0
Machinery Costs, dol.	2,375	2,658	3,063	3,753
Labor Income, dol.	3,000	3,000	3,000	3,000

<sup>1</sup>Livestock organization not allowing the purchase of feeder calves or stockers.

<sup>2</sup>Livestock organization not allowing the purchase of feeder calves or stockers nor hog raising.

<sup>3</sup>Livestock organization allowing only a beef cow herd as a livestock enterprise.

Table 10. Programmed Land Use with Different Livestock Organizations for Minimum Resources to Earn \$5,000 Labor Income (0 Land Price)

	Basic	Livestock Organization		
		B <sup>1</sup>	C <sup>2</sup>	D <sup>3</sup>
Corn, acres	137	154	213	157
Oats, acres	87	140	84	66
Barley, acres	0	0	0	0
Wheat, acres	64	22	139	150
Flax, acres	7	22	30	81
Corn silage, acres	8	-	-	-
Alfalfa, acres	40	43	58	63
Fallow	20	6	11	60
Total, crop acres	363	387	535	577
Native hay, acres	62	57	84	63
Rangeland, acres	395	415	573	632
Other acres	16	32	42	56
Total, all land, acres	836	891	1234	1328
Beef cow and calf, head	0	22	39	44
Feed calves: drylot, silage, head	30	0	0	0
Feed calves: drylot, no silage, head	0	0	30	0
Feed calves: pasture, no silage, head	68	17	0	0
Gilt and litter, litters	0	54	0	0

Table 11. Financial Highlights of Programming Minimum Resource Requirements to Earn \$5,000 Labor Income with Different Livestock Organizations (0 Land Price)

	Basic	Livestock Organization		
		B <sup>1</sup>	C <sup>2</sup>	D <sup>3</sup>
Investment				
Land and Buildings, dol.	2,519	53,460	74,040	79,680
Machinery and Equipment, dol.	10,650	11,525	12,900	12,750
Operating capital, dol.	19,630	25,892	21,245	17,642
Total capital, dol.	32,799	96,508	110,498	110,812
Income and Expenses				
Gross Income, dol.	28,154	21,496	19,296	17,642
Expenses, dol.	20,101	13,409	10,899	8,850
Land charges, dol.	0	0	0	0
Machinery Costs, dol.	3,053	3,087	3,397	3,501
Labor Income, dol.	5,000	5,000	5,000	5,000

<sup>1</sup>Livestock organization not allowing the purchase of feeder calves as stockers.

<sup>2</sup>Livestock organization not allowing the purchase of feeder calves or stockers nor hog raising.

<sup>3</sup>Livestock organization allowing only a beef cow herd as a livestock enterprise.

## Changing Land Prices As It Affects Resource Requirements

Previous analysis assumed an average land price of \$60 per acre. It may be of interest to determine the effects of different land prices upon minimum resource requirements. Land prices were assumed to be zero, \$30 and \$75 per acre for comparison with \$60. Zero land prices do not occur, but represent a situation of unencumbered ownership where the owner does not consider a return from land necessary.

Programming results show that for a \$3,000 labor income, land requirements are 578 acres with zero land value, 728 acres with \$30 land, 1,016 acres with \$60 land and 1,370 acres with \$75 land (table 12). Corn acreage similarly ranges from 100 to 224. Total capital requirements range from \$26,829 to \$154,537 (table 13).

For a \$5000 labor income land requirements are 836 acres with zero land value, 1,081 acres with \$30 land, 1,613 acres with \$60 land, and 2,279 acres with \$75 land (table 14). Acres of corn range from 137 to 387 (table 14). Total capital requirements vary from \$32,799 to \$247,261 (table 15).

In programming for a \$10,000 labor income land requirements were determined to be 1,564 acres with zero land value, 2,131 acres with \$30 land,

Table 12. Programmed Land Use and Livestock with Different Land Prices and for Minimum Resource Requirements to Earn \$3000 Labor Income

	Land Price Per Acre			
	\$0	\$30	\$60	\$75
Corn, acres	100	113	166	224
Oats, acres	91	114	106	143
Barley, acres	9	11	0	0
Wheat, acres	4	6	78	106
Flax, acres	4	6	25	22
Corn silage, acres	0	13	9	13
Alfalfa, acres	28	35	49	65
Fallow	15	16	9	26
Total, crop acres	<u>251</u>	<u>314</u>	<u>442</u>	<u>599</u>
Native hay, acres	66	70	75	101
Rangeland, acres	251	329	464	636
Other, acres	10	15	35	34
Total, all land, acres	<u>578</u>	<u>728</u>	<u>1016</u>	<u>1370</u>
Feed calves, drylot, no silage, head	41	0	0	0
Feed calves, drylot silage, head	0	50	36	49
Feed calves, pasture, no silage, head	42	56	83	111

3,280 acres with \$60 land and 4,843 acres with \$75 land (table 16). Acres of corn ranged from 255 to 836 (table 16). Capital requirements vary from \$57,201 to \$524,832 (table 17).

Table 13. Financial Highlights of Programming Minimum Resource Requirements to Earn \$3000 Labor Income with Different Land Prices

	\$0	Land Price Per Acre		\$75
		\$30	\$60	
<b>Investment</b>				
Land and Buildings, dol.	2133	24,564	64,044	106,859
Machinery and Equipment, dol.	9260	9,850	11,640	14,602
Operating capital, dol.	15,431	20,394	24,452	33,076
Total capital, dol.	26,829	54,808	100,136	154,537
<b>Income and Expenses</b>				
Gross Income dol.	21,940	27,900	34,109	46,143
Expenses, dol. <sup>a</sup>	17,204	20,887	25,583	33,828
Land charges, dol. <sup>b</sup>	0	1,201	3,352	5,651
Machinery costs, dol.	2,375	2,813	3,246	3,664
Labor Income, dol.	3,000	3,000	3,000	3,000

<sup>a</sup> Includes operating and overhead expenses with 7% interest in capital.

<sup>b</sup> Assumes 5.5% interest charge.

Table 14. Programmed Land use and Livestock with Different Land Prices and for Minimum Resource Requirements to Earn \$5000 Labor Income

	\$0	Land Price Per Acre		\$75
		\$30	\$60	
Corn, acres	137	172	264	387
Oats, acres	87	123	168	238
Barley, acres	0	10	0	0
Wheat, acres	64	73	124	177
Flax, acres	7	26	39	56
Corn silage, acres	8	11	15	6
Alfalfa, acres	40	52	77	109
Fallow	20	8	14	19
Total, crop acres.	363	475	701	992
Native hay, acres	62	82	119	135
Rangeland, acres	395	486	738	1073
Other, acres	16	38	55	79
Total, all land, acres	836	1081	1613	2279
Feed calves, drylot, silage, head	30	43	50	22
Feed calves, pasture, no silage, head	68	87	131	192
Gilt and litters, litters	0	0	0	26

Table 15. Financial Highlights of Programming Minimum Resource Requirements to Earn \$5000 Labor Income with Different Land Prices

	\$0	Land Prices Per Acre		\$75
		\$30	\$60	
<b>Investment</b>				
Land and Buildings, dol.	2,519	35,771	101,637	178,489
Machinery and Equipment, dol.	10,650	11,850	14,732	15,382
Operating capital, dol.	19,630	26,647	39,177	53,490
Total capital, dol.	32,799	74,268	155,546	247,261
<b>Income and Expenses</b>				
Gross Income, dol.	28,154	36,966	54,320	71,019
Expenses, dol. <sup>a</sup>	20,101	6,851	40,039	51,744
Land charges, dol. <sup>b</sup>	0	1,784	5,323	9,401
Machinery costs, dol.	3,053	3,331	3,958	4,874
Labor Income, dol.	5,000	5,000	5,000	5,000

<sup>a</sup> Includes operating and overhead expenses with 7% interest on capital.

<sup>b</sup> Assumes 5.5% interest charge.

Table 16. Programmed Land Use and Livestock with Different Land Prices and for Minimum Resource Requirements to Earn \$10,000 Labor Income

	\$0	Land Price Per Acre		\$75
		\$30	\$60	
Corn, acres	255	349	628	836
Oats, acres	163	222	224	506
Barley, acres	0	0	0	0
Wheat, acres	120	163	370	371
Flax, acres	38	63	80	718
Corn silage, acres	15	19	4	0
Alfalfa, acres	75	102	213	213
Fallow	13	13	5	40
Total, crop acres	679	925	1424	2104
Native hay, acres	116	155	179	256
Rangeland, acres	715	946	1441	1735
Other, acres	54	79	136	168
Total, all land acres	1564	2131	3280	4843
Feed calves, drylot, silage, head	56	72	16	0
Feed calves, pasture, no silage, head	127	173	279	413
Gilt and litters, litters	0	2	21	74

Table 17. Financial Highlights of Programming Minimum Resource Requirements to Earn \$10,000 Labor Income with Different Land Prices

	<u>Land Prices Per Acre</u>			
	\$0	\$30	\$60	\$75
<b>Investment</b>				
Land and Buildings, dol.	4,676	70,387	206,742	379,735
Machinery and Equipment, dol.	14,705	14,928	19,621	30,824
Operating capital, dol.	37,820	52,041	72,288	714,273
Total capital, dol.	57,201	137,356	298,651	524,832
<b>Income and Expenses</b>				
Gross Income, dol.	52,667	71,344	98,766	146,871
Expenses, dol. <sup>a</sup>	39,046	53,234	71,925	108,962
Land Charges, dol. <sup>b</sup>	0	3,515	10,824	19,976
Machinery costs, dol.	3,621	4,595	6,017	7,976
Labor Income, dol.	10,000	10,000	10,000	10,000

<sup>a</sup> Includes operating and overhead expenses with 7% interest in capital.

<sup>b</sup> Assumes 5.5% interest charge.

## IMPLICATIONS FOR ADJUSTMENTS

It is evident from the programming results that ranchers in Faulk County may earn a \$3,000 return with somewhat less land than included on the average ranch in Faulk County (1,138 acres according to the 1964 census). However, in order for a rancher to earn a \$5,000 labor income, land requirements are nearly 600 acres above the average size. If \$10,000 is considered necessary labor income, land requirements would nearly triple over the \$3,000 level (tables 12, 13, 14, 15, 16, 17).

In general, the increase in minimum resources to obtain higher income levels requires nearly the same enterprise combination for the different levels. Particularly, there is little change from the \$3,000 to the \$5,000 level. At the \$10,000 income level with corn and wheat increased in relation to other crop enterprises, the hog enterprise becomes profitable to have in place of some of the dry-lot calf feeding.

It may be noted that the minimum resource ranch had a slightly higher percentage of crop acreage devoted to corn production, with corn replacing



small grain. Perhaps, higher production of corn reflects the type of livestock enterprise included in the plan.

The greatest contrasts in organization of the minimum resource ranch compared with a typical ranch (as shown by the U.S. Census for Faulk County) are in the livestock enterprises. The programmed organization included only a livestock activity of buying calves and selling choice fat cattle. However, few ranchers in Faulk County presently include similar livestock enterprises. Perhaps, the reason may be that large amounts of capital and more managerial ability are required by the enterprise. Also, cattle feeding involves more risk than other livestock enterprises.

Perhaps, one reason cattle feeding is not prevalent in the area may be lack of capital or credit for carrying out such an enterprise. One observes that credit institutions are reluctant to loan money for cattle feeding when neither they nor the applicant has much knowledge of the profits and risks of cattle feeding. Still it would appear that livestock feeding by the better operators could be a desirable way to increase incomes.

# APPENDIX

## Appendix Tables

- Table A-1 Assumed Average Prices Paid and Received by Farmers, Faulk County, South Dakota
- Table A-2 Estimated Operating and Ownership Cost of Machine Complement, 1280 Acre Farm, Faulk County
- Table A-3 Assumed Per Acre Overhead Costs in the Model of this Study, Faulk County
- Table A-4 Assumed Nonallocated Annual Overhead Costs for a 1280 Acre Farm, Faulk County
- Table A-5 Estimated Average Yields Per Acre Using Recommended Cropping Practices, by Land Class, Faulk County
- Table A-6 Estimated Per Acre Labor Requirements and Seasonal Distribution for Selected Dryland Crops
- Table A-7 Average Dates for Selected Cropping Operations, Faulk County
- Table A-8 Assumed Per Acre Variable and Overhead Costs for Average Crop Yield, Faulk County
- Table A-9 Specified Variable Costs and Capital Requirements per Unit of Livestock Enterprises, Faulk County
- Table A-10 Resource Restrictions Used in Initial Tableau for Representative Farm Situation, Faulk County
- Table A-11 Description of Activities Considered for Representative Farm Situation, Faulk County

Table A-1 Assumed Average Prices Paid and Received by Farmers,  
Faulk County, South Dakota

Item	Unit	Price
		(Dollars)
<u>Prices Paid:</u>		
Seeds:		
Wheat	bu.	2.65
Barley	bu.	1.76
Oats	bu.	1.33
Corn (hybrid)	bu.	12.90
Flax	bu.	3.50
Alfalfa	cwt.	44.02
Livestock:		
Yearling steer purchased (April)	cwt.	23.26
Yearling feeder steer bought (October)	cwt.	23.08
Steer Calf bought (October)	cwt.	25.28
Gilt (breeding Stock)	unit	60.00
Labor	hour	1.25
Custom Rates:		
Combine, small grain	acre	3.50
Haystack moving	unit	6.00
Fuel and Lubricants:		
Gasoline	gal.	.25
Motor oil	gal.	1.25
Lubricant	lb.	.22
<u>Prices Received:</u>		
Crop products:		
Wheat	bu.	1.82
Oats	bu.	.53
Barley	bu.	.81
Flax	bu.	2.75
Corn	bu.	1.09
Livestock products:		
Choice steer sold (October)	cwt.	24.15
Choice steer sold (April)	cwt.	23.97
Yearling Stocker steer (October)	cwt.	23.08
Steer calf (October)	cwt.	25.28
Cull cow	cwt.	13.04
Market sows (farrowed once)	unit	54.57
Butcher hogs (late spring litter)	cwt.	15.82

Table A-2 Estimated Operating and Ownership Cost of Machine Complement, 1280 Acre Farm, Faulk County

Machine	Years <sup>a</sup> Useful Life (Years)	Hours <sup>b</sup> Useful Life (Hours)	Average <sup>c</sup> Annual Investment (Dollar) (Dollar)	Annual <sup>d</sup> Fixed Cost (Dollar) (Dollar)	Per Acre <sup>e</sup> Annual Fixed Cost (Dollar) (Dollar)	Per Acre <sup>f</sup> Variable Cost (Dollar) (Dollar)
Tractor, 4 plow	20	12,000	2,400	473	.387	.979
Tractor, 3 plow	20	12,000	1,825	359	.295	.929
Moldboard Plow, 4-14"	15	2,500	438	112	.330	.103
Tandem Disc, 12'	20	2,500	416	91	.139	.027
Spike Tooth Harrow, 5 Section	25	2,500	81	16	.013	.004
Press drill-Fert. attach., 10'6"	20	1,200	765	168	.594	.038
Boom Type Sprayer, 30'	15	1,000	225	46	.006	.008
Corn Planter, 4R	20	1,200	630	124	.409	.051
Corn Cultivator, 4R	20	1,200	472	103	.368	.036
Corn Picker, 2R	15	2,000	1,300	320	1.554	.187
Windrower-pto, 12'	18	2,500	450	104	.145	.080
Mower, 9'	18	2,000	292	67	.133	.095
Rake, Side Delivery	18	2,500	281	65	.123	.031
Loader and Attachments	15	2,500	540	136	.268	.225 <sup>g</sup>
Combine, pto.	15	2,000	1,600	380	1.171	.197
Total			11,715	2,564		

<sup>a</sup>Estimates based on survey of Faulk County Farmers and ASAE 1965 Agricultural Engineers Yearbook.

<sup>b</sup>Estimates from 1965 Agricultural Engineers Yearbook.

<sup>c</sup>Estimates based on Official 1965 Tractor and Farm Equipment Guide.

<sup>d</sup>Interest on investment, depreciation, insurance and taxes.

<sup>e</sup>Estimates assume machine used enough to wear out during its useful life, i.e. minimum cost estimates.

<sup>f</sup>Repair and service cost of machine only.

<sup>g</sup>Variable cost per hour.

Table A-3 Assumed Per Acre Overhead Costs in the Model of this Study, Faulk County

Item	Cost
	(Dollars)
Interest on land <sup>a</sup>	3.30
Land Tax	.81
Insurance (liability)	.004
Depreciation and Maintenance, fences	.29
Total overhead cost per acre	44.04

<sup>a</sup>When assumed land price is 60 dollars and interest rate is 5.5 percent.

Table A-4 Assumed Nonallocated Annual Overhead Costs for a 1280 Acre Farm, Faulk County

Item	Investment	Annual Cost
		(Dollars)
Machinery Fixed Costs:		
Machine Set		1,145 <sup>a</sup>
Pick-up Truck, 1/2 ton	1350	
Interest on investment		98
Depreciation		330
Gas, oil, and lubrication		265
Repairs		80
Insurance		60
License		20
Wagons (2) with hoist	430	92
Fuel Tank (300 gal.)	90	8
Tools and equipment	300	50
Miscellaneous:		
Telephone and electricity		175
Tax service and bookkeeping supplies		50
Insurance (liability and employee)		52
Total specified overhead costs		2,227

<sup>a</sup>Includes interest, insurance, and taxes from Table 14.

Table A-5 Estimated Average Yields Per Acre Using Recommended Cropping Practices, By Land Class, Faulk County

Item	Unit	Yield by Land Class				Weighted Average <sup>a</sup>
		a	b	c	d	
Crop:						
Corn	bu.	30	23	24	20	23.7
Corn Silage	cwt.	116	86	90	76	90.0
Oats	bu.	40	36	34	30	36.2
Barley	bu.	30	26	20	17	25.1
Wheat <sup>b</sup>	bu.	19	15.5	15	13	16.1
Wheat on fallow	bu.	21	17	16	14	17.5
Flax	bu.	11	9	10	9	9.7
Alfalfa Hay	bu.	1.6	1.3	1.1	1.3	1.3
Native Hay -- Estimated yield was .67 Ton						
Native Pasture -- Estimated yield was .55 AUM						

<sup>a</sup>The weighted average is the sum of the average yield for each land class times the percent that land class is of the total.

<sup>b</sup>Assumes wheat on row crop or small grain.

Table A-6 Estimated Per Acre Labor Requirements and Seasonal Distribution for Selected Dryland Crops

Crop	Man-hours per acre <sup>a</sup>	Percent Distribution of Labor by Period <sup>b</sup>			
		March 16 to April 30	May 1 to July 15	July 16 to September 30	October 1 to November 15
Corn grain	2.74	0	62	0	38
Corn silage	2.25 <sup>c</sup>	0	76	24	0
Oats	1.65	32	10	58	0
Barley	1.65	32	10	58	0
Wheat <sup>d</sup>	1.65	34	10	56	0
Flax	2.79	19	35	46	0
Alfalfa hay	1.98 <sup>d</sup>	0	52	45	3
Native hay	1.04 <sup>d</sup>	0	0	96	4
Fallow	.81	0	0	100	0

<sup>a</sup>Tractor hours are approximately 10 percent lower.

<sup>b</sup>Distribution will vary if fall plowing is assumed.

<sup>c</sup>Does not include time for custom chopping and hauling.

<sup>d</sup>Does not include time for custom stack-moving.

Table A-7 Average Dates for Selected Cropping Operations,  
Faulk County

Item	Date
Start field work	April 10
Start seeding spring wheat	April 16
Finish seeding spring wheat	May 10
Finish seeding oats and barley	May 17
Finish seeding flax	May 22
Plow for corn	May 17
Plant corn	May 24 to June 5
Small grain spraying	June 7
Row crop spraying	June 21
First row crop cultivation	June 14
Second row crop cultivation	July 12
Start summer fallow	June 14
First crop tame hay	June 14
Second crop tame hay	August 10
Harvest native hay	August 18
Swath spring wheat	August 10
Swath oats	August 5
Swath barley	August 6
Swath flax	August 20
Start cutting corn silage	September 14
Pick corn	October 1
Start fall field work	September 17
	and continue into October

Source: Compiled by Erwin Ullrich from records of the Crop and Livestock Reporting Service.

Table A-8 Assumed Per Acre Variable and Overhead Costs for Average Crop Yield, Faulk County

	Corn grain	Corn silage	Wheat	Wheat after fallow	Oats	Barley	Flax	Fallow	Alfalfa hay	Native hay
	(Dollars)									
Variable Costs:										
Tractor power	2.62	1.88	1.86	1.86	1.86	1.86	2.03	1.29	1.16	1.57
Repairs	.75	.44	.51	.51	.51	.51	.57	.04	.54	.25
Seed	1.81	1.81	2.65	2.65	2.05	2.20	2.62		1.10	
Chemical	2.45	2.45	.36	.36	.10	.30	.28	.36	.43	
Fertilizer	3.25	3.92	2.98	1.08	2.75	2.63	4.90		1.23	
Custom		6.00							1.25	1.20
Interest	.76	.94	.59	.45	.52	.53	.73	.05	.40	.14
Overhead Costs:										
Depreciation	2.69	1.61	2.03	2.03	2.00	2.00	2.37	.30	.98	.49
I. T. and S. <sup>a</sup>	.79	.45	.64	.64	.64	.64	.79	.06	.36	.18
Total specified costs	15.12	19.60	11.62	9.58	10.53	10.67	14.29	1.10	7.45	2.83

<sup>a</sup>Insurance, Taxes and Shelter.

Table A-9 Specified Variable Costs and Capital Requirements per Unit of Livestock Enterprises, Faulk County

Item	Beef cow	Stocker steer-silage	Feeder steer-drylot	Amount per head		Drylot yearlings period 1 and period 2	Gilt and litter
				Feeder steer-pasture	Drylot yearlings period 1		
Dollars							
Variable Costs:							
Supplement <sup>a</sup>	6.66	2.35	20.07	13.15	13.51	27.02	60.39
Veterinary	4.75	2.78	3.78	3.78	3.78	7.56	7.00
Taxes	4.56	2.17	2.17	2.17	3.23	6.49	1.20
Equipment	3.63	6.03	8.41	7.86	7.11	12.26	11.67
Total	21.40	14.33	30.70	26.96	26.63	51.33	80.46
Livestock	228.15	108.70	108.70	108.70	161.56	324.38	60.00
Building and Equipment	39.54	25.70	30.18	30.18	30.18	30.18	80.18
Capital <sup>b</sup>	289.09	148.73	169.58	165.85	218.57	405.89	241.26

<sup>a</sup>Protein, salt, and mineral requirements are for silage feeding. When silage was not included in the ration, protein requirements were smaller.

<sup>b</sup>Capital is the sum of total variable costs, livestock investment and average buildings and equipment investment.

Table A-10 Resource Restrictions Used in Initial Tableau for Representative Farm Situation, Faulk County

Item	Row	Unit	Initial Level
Class a land	R01	Acre	0.0
Class b land	R02	Acre	0.0
Class c land	R03	Acre	0.0
Class d land	R04	Acre	0.0
Native Hay	R05	Acre	0.0
Native Pasture	R06	AVM	0.0
Wheat Allotment	R07	Acre	0.0
Period One Labor	R08	Hour	508.0
Period Two Labor	R09	Hour	210.0
Period Three Labor	R10	Hour	493.0
Period Four Labor	R11	Hour	583.0
Period Five Labor	R12	Hour	306.0
Total Capital	R13	Dollar	0.0
Annual Capital	R14	Dollar	0.0
Hay to Harvest	R15	Ton	0.0
Feed Grain Transfer	R16	CWT. C. E.	0.0
Wheat Transfer	R17	Bushe1	0.0
Flax Transfer	R18	Bushe1	0.0
Grain to Feed	R19	CWT. C. E.	0.0
Hay Equivalent	R20	CWT.	0.0
Silage	R21	CWT.	0.0
Calf Transfer	R22	Animal	0.0
Period One Yearling Transfer	R23	Animal	0.0
Period Two Yearling Transfer	R24	Animal	0.0
Livestock for Sale	R25	CWT.	0.0
Income Requirement	R26	Dollar	Varies



Table A-11 Description of Activities Considered for Representative Farm Situation, Faulk County

Activity Description	Unit of Measure
<u>Cropland</u>	
Class a Land Rotations	
P01 Corn-wheat	Acre
P02 Corn silage-wheat	Acre
P03 Corn-barley	Acre
P04 Corn silage-barley	Acre
P05 Corn-oat	Acre
P06 Wheat-oat-fallow	Acre
P07 Wheat-wheat-fallow	Acre
P08 Flax-wheat-fallow	Acre
P09 Barley-corn-oat-alfalfa (3 years)	Acre
P10 Wheat-corn-barley-alfalfa (3 years)	Acre
P11 Wheat-corn-corn silage-oat-alfalfa (3 years)	Acre
P12 Wheat-corn-corn silage-oat-alfalfa (3 years)	Acre
P13 Wheat-corn silage-corn-flax-alfalfa (3 years)	Acre
P14 Wheat-corn-flax-fallow	Acre
P15 Wheat-corn-oat-fallow	Acre
P16 Barley-corn-barley-alfalfa (3 years)	Acre
P17 Barley-corn silage-barley-alfalfa (3 years)	Acre
P18 Oat-corn-oat-alfalfa (3 years)	Acre
Class b Land Rotations	
P19 Corn-wheat	Acre
P20 Corn-barley	Acre
P21 Corn silage - barley	Acre
P22 Corn-oats	Acre
P23 wheat-wheat-fallow	Acre
P24 Flax-wheat-fallow	Acre
P25 wheat-corn-oat-alfalfa (3 years)	Acre
P26 wheat-corn silage-oat-alfalfa (3 years)	Acre
P27 Flax-corn-oat-alfalfa (3 years)	Acre
P28 Barley-corn-oat-alfalfa (3 years)	Acre
P29 Corn silage-oat-alfalfa (3 years)	Acre
P30 Barley-corn-barley-alfalfa (3 years)	Acre
P31 Barley-corn silage-barley-alfalfa (3 years)	Acre
P32 Oat-corn-oats-alfalfa (3 years)	Acre
Class c Land Rotations	
P33 Wheat-corn-flax-alfalfa (3 years)	Acre
P34 Wheat-corn-oat-alfalfa (3 years)	Acre
P35 Flax-corn-oat-alfalfa (3 years)	Acre
P36 Corn-oats-alfalfa (3 years)	Acre
P37 Corn silage-oats-alfalfa (3 years)	Acre
P38 Wheat-corn silage-oat-alfalfa (3 years)	Acre
P39 Wheat-oat-alfalfa (4 years)	Acre
P40 Wheat-oat-alfalfa (3 years)	Acre
P41 Oat-corn-oat-alfalfa (3 years)	Acre
P42 Oat-corn silage-oat-alfalfa (3 years)	Acre
P43 Barley-corn-barley-alfalfa (3 years)	Acre
Class d Land Rotations	
P44 Wheat-wheat-fallow	Acre
P45 Flax-wheat-fallow	Acre

Table A-11 continued.

	Activity Description	Unit of Measure
<u>Cropland (continued)</u>		
P <sub>46</sub>	Wheat-corn-oat-alfalfa (3 years)	Acre
P <sub>47</sub>	Wheat-corn silage-oat-alfalfa (3 years)	Acre
P <sub>48</sub>	Flax-corn-oat-alfalfa (3 years)	Acre
P <sub>49</sub>	Barley-corn-oat-alfalfa (3 years)	Acre
P <sub>50</sub>	Barley-corn silage-oats-alfalfa (3 years)	Acre
P <sub>51</sub>	Oat-alfalfa (3 years)	Acre
P <sub>52</sub>	Oat-corn-oat-alfalfa (3 years)	Acre
P <sub>53</sub>	Oat-corn silage-oat-alfalfa (3 years)	Acre
P <sub>54</sub>	Barley-corn-barley-alfalfa (3 years)	Acre
P <sub>55</sub>	Native Hay	Acre
<u>Livestock Enterprises</u>		
P <sub>56</sub>	Beef-cow and calf	Cow - Calf
P <sub>57</sub>	Stockers, silage-hay ration	Head
P <sub>58</sub>	Stockers, grain-hay ration	Head
P <sub>59</sub>	Feed calves in drylot, silage-hay	Head
P <sub>60</sub>	Feed calves in drylot, grain-hay	Head
P <sub>61</sub>	Feed calves on pasture, silage-hay	Head
P <sub>62</sub>	Feed calves on pasture, grain-hay	Head
P <sub>63</sub>	Feed yearlings: period one, silage-hay	Head
P <sub>64</sub>	Feed yearlings: period one, no silage-hay	Head
P <sub>65</sub>	Feed yearlings: period one and two, silage-hay	Two head
P <sub>66</sub>	Feed yearlings: period one and two, grain-hay	Two head
P <sub>67</sub>	Gilt and one litter	Sow-litter
<u>Purchase and Sale of Livestock</u>		
P <sub>68</sub>	Sell feeder calf	Head
P <sub>69</sub>	Buy feeder calf	Head
P <sub>70</sub>	Sell stocker	Head
P <sub>71</sub>	Buy period one yearling	Head
P <sub>72</sub>	Buy period two yearling	Head
P <sub>73</sub>	Sell Livestock	Hundred weight
<u>Hire Labor</u>		
P <sub>74</sub>	Hire period one labor	Hour
P <sub>75</sub>	Hire period two labor	Hour
P <sub>76</sub>	Hire period three labor	Hour
P <sub>77</sub>	Hire period four labor	Hour
P <sub>78</sub>	Hire period five labor	Hour
P <sub>79</sub>	Borrow capital	Dollar
P <sub>80</sub>	Feed feed grain	Corn equivalent
P <sub>81</sub>	Sell feed grain	Corn equivalent
P <sub>82</sub>	Sell wheat	Bushel
P <sub>83</sub>	Sell flax	Bushel
P <sub>84</sub>	Feed hay	Ton
P <sub>85</sub>	Buy land	Acre

