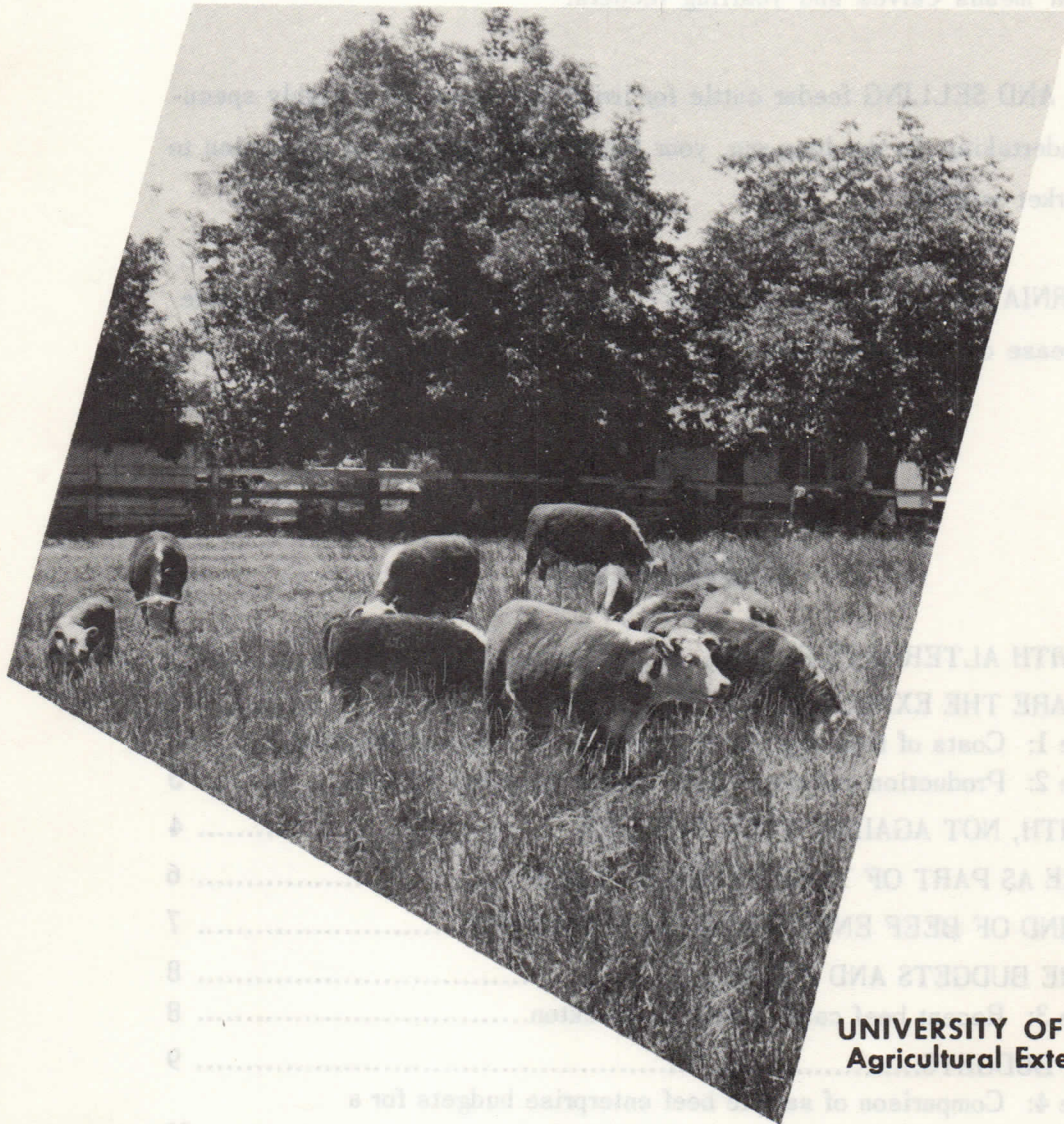


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# Beef Cattle on IRRIGATED PASTURE



UNIVERSITY OF CALIFORNIA  
Agricultural Extension Service

PROFIT--with the right kind of beef cattle

PROFIT--from land not suited to other uses

PROFIT--from lower feed costs

*A Detailed Analysis of Cost Factors in Planning Beef  
Production on Irrigated Pasture in California--October, 1954*



IRRIGATED PASTURE is cheaper feed than harvested crops--hay, silage, green chopped forage--but more expensive than natural range.

THE BASIC PRINCIPLE is to use irrigated pasture when it will produce the most pounds of high-value beef per 100 pounds of nutrients (TDN) or per acre --and that means calves and yearling feeders.

BUYING AND SELLING feeder cattle for irrigated pasture is a highly speculative undertaking. In the long run, your financial success is in proportion to your market wisdom.

CALIFORNIA HAS about 770,000 acres of irrigated pasture. Irrigated pasture will increase on land not needed for or suited to higher value crops.

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# Beef Cattle on IRRIGATED PASTURE

by ARTHUR SHULTIS

Extension Economist, Farm Management

Getting a profit out of beef cattle on irrigated pasture, depends on how little the pasturage costs you, the kind and number of your cattle, and how well you manage both cattle and pasture. This publication will help you choose the right kind of beef cattle for your pasture. It will help you decide how many head you will need and how to get them when you want them.

Needless to say, beef cattle production is but one of several profitable uses for irrigated pasture.

## BEGIN WITH ALTERNATE PLANS

The best way to choose the most profitable use of your irrigated pasture is to make several different plans and budgets and compare them.

Make a note of pasturage and other feeds you expect to have. Select two or three types of possible beef enterprises. Make a plan for each type of enterprise. Indicate on a monthly basis the number of head to fit your pasture cycle (see tables 5 to 9, pages 11 to 15. Estimate the prices you expect to pay and receive for your stock and estimate expenses for the number of head in your plan.

Estimate your earnings at any level convenient to you, with or without your labor. Compare

potential profits and consider the risks, to arrive at the best plan.

## WHERE ARE THE EXPENSES?

### How Much Feed Are You Getting?

Only a part of livestock feed is digested and used, but it's that part that helps the animal live and grow and produce. The usable part of livestock feed, the total digestible nutrients (TDN), is made up of those proteins, carbohydrates, and fats that the animal can digest. The amount of this food or the TDN is what you use to compute cost and value of different feeds.

Generally, a pound of TDN from one feed is as valuable to the animal as a pound from some other feed. During the annual cycle of a beef enterprise, several different feeds will be used. The cost of the TDN will change accordingly, and, obviously, the higher the average annual cost, the less the profit.

Irrigated pasture, as grown in California, is not the cheapest feed. As a feed source, it is more expensive than natural range in California, but generally cheaper than harvested feed crops such as hay, green chopped forage, silage, and concentrates. (See table 1 for a comparison of cost of the TDN in different feeds.)

TABLE 1: COSTS OF TOTAL DIGESTIBLE NUTRIENTS (TDN) FOR DIFFERENT FEEDS

	Unit	Pounds TDN per unit	Units equiv. to one AUM	Sample price	Cost 100 lbs. TDN
Natural range	AUM	400	1.00	\$ 2.50	\$ .63
Irrigated pasture	AUM	400	1.00	6.00	1.50
Hay, about 50% TDN	Ton	1,000	.40	20.00	2.00
Silage, about 15% TDN	Ton	300	1.33	6.60	2.20
Green chopped alfalfa, 76% moisture	Ton	267	1.50	6.00	2.24
Concentrates, grains, about 75% TDN	Ton	1,500	.27	60.00	4.00



## How Much Pasturage Does an Animal Need?

The amount of pasturage an animal needs is estimated in animal unit months (AUM). The AUM is the quantity of feed needed for normal growth or production by a mature head of cattle (a beef cow or 2-year-old steer) for one month. It equals 400 pounds of TDN or 0.4 tons of hay (see table 1). Use the following conversion factors to change different ages and sizes of cattle into animal units:

A 400- to 500-pound weaner calf equals 0.5 animal units; a 750-pound yearling equals 0.75 animal units; and feeder cattle about 0.1 animal units for each 100 pounds of weight.

Include nursing calves in the one animal unit allowed for the cow. However, to balance animal units precisely to irrigated pasture, allow 0.2 animal units at 4 to 5 months, 0.3 at 6 to 7 months, 0.4 at 8 months to weaning, and 0.5 after weaning. (Feed requirements in tables 5 to 9 reflect a gradual increase in animal units per head for growing stock.)

## Estimate the Pasture Yield

Yields per acre of irrigated pasture vary considerably from month to month and from year to year. Furthermore, total yields for the year will vary widely from farm to farm, depending on differences in soil, climate, culture, and grazing management.

Records show that pasturage may vary from a low of 5 AUM per acre for the season, to a high of 30. In an area with long, cold winters, a good yield may be as low as 8 AUM per acre. In Southern California, the yield can be as high as 18 AUM.

In areas where the crop is important, an acre of irrigated pasture will generally produce from one to two AUM of feed per acre each month during the spring and summer. In the winter, production may be from nothing to one AUM of feed monthly, depending on location and weather.

Twelve AUM per acre is a good yield expectancy in the major irrigated valleys--San Joaquin, Sacramento, Salinas, and Russian River. The yield would be distributed over the months. (See schedule B, table 2.) Be sure to estimate your own monthly yields for pasture when making your plans.

Cattle weighed in and out of irrigated pasture, showed production of 300 to 500 pounds per acre for the season. Occasionally produc-

tion was as high as 800. On the other hand, poor management of the pasture and overstocking can reduce production to the point where the animal is merely maintained at its starting weight with no net gain. A properly stocked pasture, yielding about 12 AUM per acre should produce approximately 500 pounds of gain on young feeder animals.

Table 4 shows nine examples of production. The range is from 371 to 687 pounds of beef produced per acre. The difference is due to the kind of cattle.

## Check Pasture Costs

Before starting beef production, estimate expenses for the irrigated pasture. The cost of the TDN may be too high for you to make a profit. (See table 2 for sample expenses.) Change yield, hours, prices, etc., to fit your farm when preparing a budget. Cash and depreciation costs are \$55.61 per acre or \$4.63 per AUM in the sample beef enterprise budgets in tables 6 to 9.

## WORK WITH, NOT AGAINST YOUR PASTURE

### Fit the Feed Cycle

Pasturage varies somewhat with the local climate. It is generally most abundant in May and June, yielding less and less from then on until November's low level. Few beef enterprises fit exactly this monthly pasture cycle. An ideal adjustment of cattle to pasturage would be to buy the cattle in the spring as pasturage becomes available and to sell the cattle in the fall when pasturage declines. But it is not often possible to buy feeder animals at suitable prices at just these times.

There are usually few feeder cattle in the market in the spring, and those few generally are a cent or two higher than they would be in the fall when most of the western raised animals come off summer range.

Notice the cow herd in example 5 table 9. It is badly adjusted to the pasture cycle. You would have to make the pasturage surplus of May and June into hay. In the winter, the herd would require a considerable amount of hay.

The feeder examples are better fitted to pasturage, though examples 2 and 4, tables 6 and 8, still show much winter feeding of hay and some spring surplus of pasturage.



**TABLE 2: PRODUCTION AND COSTS FOR A TYPICAL IRRIGATED PASTURE**

At the right are three sample yields, listed by month. "A" represents the southern part of the San Joaquin Valley and other areas where some feed is available in the winter. "B" represents conditions farther north. "C" is typical of areas with cold or wet winters, having no use of the pasture for about 4 or 5 months.

In the schedule below for expenses per acre, the costs per animal unit month were based on schedule B--a yield of 12. Pasture is irrigated by flooding from an owned well. The power cost is \$11.30 per acre. Depreciation and interest on the investment in well and pump raises the total water cost to \$15.05, or \$3.35 per acre-foot of water.

**Yield AUM per Acre**

Mo.	A	B	C
Jan.	0.3	0.1	0.0
Feb.	0.5	0.1	0.0
Mar.	1.0	0.6	0.3
Apr.	1.5	1.2	1.1
May	1.8	1.9	1.5
June	1.7	1.8	1.7
July	1.6	1.6	1.6
Aug.	1.5	1.4	1.4
Sept.	1.5	1.3	1.2
Oct.	1.4	1.1	1.0
Nov.	0.8	0.6	0.2
Dec.	0.4	0.3	0.0
Total	14.0	12.0	10.0

**SAMPLE EXPENSES FOR AN IRRIGATED PASTURE WITH A YIELD OF 12 AUM**

Item of Expense	Hours or quantity per acre	Cost per hour	Costs		
			Per acre	Per AUM	
Labor: Applying manure and fertilizer	2	\$1.00	\$2.00	\$0.17	
Dragging, mowing, fence work, misc.	2	1.00	2.00	.17	
Irrigation (by flooding from ditches)	7	1.00	7.00	.58	
Tractor and truck for all operations	3	1.60	4.80	.40	
Total labor and field power			15.80	1.32	
Power to pump 54 acre-inches of water (100-foot head)	4.5 A. ft.	2.51	11.30	.94	
Manure and commercial fertilizer as needed			10.00	.83	
Misc.: Seed, weed control, fence repairs			2.00	.17	
Total material cost			23.30	1.94	
General expense: Office, phone, etc. (5% of labor and material cost)			1.96	.16	
County taxes (\$80 value at 6%)			4.80	.40	
Total cash costs			45.86	3.82	
Investment overhead (100 acre unit)	Original cost		Av. invest.	5% int.	Depreciation
	100 acres	Per acre	Dollars per acre		
Stand: 10-year life	\$2,500	\$25.00	\$12.50	\$ .63	\$2.50
Irrigation: Well and pump	5,000	50.00	25.00	1.25	2.50
Ditches and border boxes	1,000	10.00	5.00	.25	2.00
Fencing	2,000	20.00	10.00	.50	1.00
Misc.: Buildings and equipment	2,500	25.00	12.50	.62	1.75
Land	30,000	300.00	300.00	15.00	
Total investment	43,000	430.00	365.00		
Total depreciation				9.75	9.75
Subtotal cash and depreciation costs				55.61	4.63
Total interest on investment			18.25	18.25	1.52
Total costs				73.86	6.15

This schedule is not an average cost for irrigated pasture. It is merely a guide to help you estimate your own costs and to show you that irrigated pasture is not a cheap feed.

The cost per AUM is \$6.15, with 12 AUM of pasturage per acre. The cost per 100 pounds of TDN is \$1.54. This equals hay at \$15.38 per ton. With a 14 AUM yield per acre, cost per AUM would be \$5.28, or \$1.32 per cwt. TDN, equaling hay at \$13.20 per ton.

In the best locations, with the most efficient management, you might get 18 AUM which would lower cost per AUM to \$4.10.



Consider hay cut as a part of irrigated pasture yields at 2.5 AUM to the ton. Yields are generally from 1 to 1.5 tons per acre, but yields as high as 3 tons for the single cutting have been reported. Usually, you can defer the use of pasturage produced for a month or two. If winters are not too cold and wet, you can use pasturage grown in October, in November and December. (See examples 2 and 4, tables 6 and 8, for pasturage without cattle in October.) For any irrigated pasture, you will probably need a corral where you can feed animals hay when they are not in the pasture.

### Choose the Kind of Enterprise

Market beef is produced in three stages: First is the production of weaner calves from a breeding herd. To carry cows, bulls, and replacement heifers for a year in order to produce weaner calves of about 400 pounds or more requires from 11 to 16 pounds of TDN per pound produced. Low-cost natural range is most suited to this stage.

The second stage is the period of rapid growth, from calf to yearling feeder. Growth can be accomplished readily with forage. It takes only 7 pounds of TDN to produce a pound of gain. Though any beef enterprise depends on changing prices and other market conditions, this second stage of development is usually the most profitable for irrigated pasture. The young animals gain up to 1 1/2 pounds per day.

In the third stage of development, the animal is finished for market. You can use a feed lot or supplemental feeding of concentrates and some hay while animals are on irrigated pasture. It takes about 8 to 10 pounds of TDN at this point to produce a pound of gain. *Animals finished to the grade of "good" or "choice" bring higher prices which usually more than pay for the higher cost of feed.*

### PASTURE AS PART OF YOUR RANCH OR FARM

To use irrigated pasture profitably, you should consider other feeds available on your farm. The wise farmer or rancher chooses the best beef enterprise or stage of development for his entire feed supply--range, hay, grain, etc.

Irrigated pasture is used in three main ways: on a large range-cattle ranch, on an irrigated farm growing other crops, and where irrigated pasture is the entire farm.

### As Part of the Ranch

Irrigated pasture on a large range-cattle ranch is a valuable supplement to natural feed on the range. In most of California it provides high-quality feed after natural range has dried up. You can use irrigated pasture to put additional gain and value per pound on calves or yearlings produced on the range. (See example 1 and 3, tables 5 and 7.)

Irrigated pasture also furnishes occasional additional nutrients to the breeding herd in times of feed shortage. With irrigated pastures, better grazing management on the range is easier. It is not profitable however, to use irrigated pasture merely to increase the size of the cow herd, continuing to sell the same age, weight, and grade of stock. Such use increases your average feed cost per pound of gain without increasing the value per pound.

Beef cattle are produced all over the country on natural range and non-irrigated land. Feed costs are much lower than on irrigated pastures in California. Beef from irrigated pasture sells in competition with this low-cost beef. Your beef enterprise must be able to absorb the higher cost of nutrients. Increasing the weight and value per pound--the second and third stages of beef production--is the best way to profit with beef production on irrigated pasture. A cow herd is usually not satisfactory.

### As Part of the Irrigated Farm

With even the best of management, irrigated pasture does not offer as great an opportunity for profit per acre as do most of the field and vegetable crops, such as sugar beets, potatoes, melons, and cotton. However, if you are using irrigation to produce several different crops there may be a profit opportunity in feeding young beef animals. Irrigated pasture, crop residues, and other feed crops will be marketed by increasing the weight and value per pound of feeder cattle.

Or you may think of irrigated pasture as part of a crop rotation program because of its value to following crops. (Examples 2, 3, and



4 can be modified to fit the irrigated farm by using crop residues or carrying animals to the "choice" grade in a feed lot.)

### **Irrigated Pasture Alone**

Land given over to irrigated pasture alone is generally not suited to more profitable crops. With proper management, shallow, hardpan soils will produce good yields of irrigated pasture. Furthermore, the water costs, land values, and taxes are generally lower. Costs per AUM may be lower than are shown in table 2.

Under the present prices for all kinds of cattle, the cost of such feed is still too high for running a breeding herd the year round. Fall purchased calves, and yearlings would be more profitable on the pasture. (See examples 2, 3, and 4.)

*Regardless of other feeds available on the farm, the basic principle is to use irrigated pasture when it will produce the most pounds of high-value beef per 100 pounds of TDN or per acre--and that means calves and yearling feeders.*

### **WHAT KIND OF BEEF**

#### **ENTERPRISE DO YOU WANT?**

#### **Profit from Calves**

From our coast range, weaner calves are available in greatest number from July to November, which is after the end of the good natural grass period from June to July. Many stockmen with nothing but range keep the calves to sell as yearling feeders after another grass season.

Where California weaners are available from your own range herd, or by purchase at a reasonable price, they are profitable for feeding on irrigated pasture through the rest of the pasture season. After which, they will probably need to be finished for slaughter with several months in the feedlot.

To use the irrigated pasture in the spring before the calves are available, you would have to harvest a crop of hay (see example 1).

Later in the fall, weaner calves become available from the inter-mountain areas with more severe winters. These calves are usually at the lowest price per pound for the season.

Buying at this time, you would have to carry the calves through the winter months, largely on other feeds, before you could use them to harvest the irrigated pasture (see example 2).

### **Yearling Feeders on Pasture**

The yearling is generally from one to two years old. Feed requirement per head and per pound of gain is greater than for an 8- or 9-month-old weaner calf, yet the gain per head per day on irrigated pasture is little more than that of the calf--from 1.25 to 1.50 pounds. An acre of irrigated pasture that would carry two yearlings per acre would carry three calves, so pounds produced per acre would be greater with the calves.

Stocker yearlings are largely available in greatest number in the fall but also come off our spring grass ranges from May to July. They can then be grazed on irrigated pasture for the remainder of the season. You can finish yearlings for market to grade of good with concentrate feeding while still on pasture. See example 3 for the seasonal grazing of yearlings purchased in the spring. See example 4 for a yearling feeder enterprise with yearlings bought in the fall and sold the following fall.

### **Breeding Herds Bring Little Profit**

Production efficiency is low in a cow herd because of the large amount of feed needed to maintain cows, bulls, and replacement heifers. It takes many more pounds of TDN to produce a pound of gain than in a feeder enterprise--11.6 pounds (example 5) compared to 6.1 (example 1).

Example 5 illustrates a cow herd run the entire year on irrigated pasture and hay. The "good" yearlings were sold each fall. (See examples 5a and 5b for the sale of yearling feeders and weaner calves. They are summarized in table 4.)

It is common in California to use irrigated pasture for a purebred herd from which registered breeding animals are sold at prices much higher than market beef. The animals are in a smaller area and in good condition for showing and sale, which may offset the higher costs of production.



Thin cows with calves, purchased in the spring and sold in the fall at the end of the pasture season, is another enterprise that is occasionally profitable on irrigated pasture. Profit depends on favorable purchase and selling prices.

Example 6 is based on paying 11 cents a pound for 140 cows at 900 pounds and 20 cents a pound for 50 calves at 150 pounds. The animals were purchased in the spring. Of the cows, 138 were sold at 1100 pounds for 12 cents a pound, and 69 weaner calves at 475 pounds were sold for 18.3 cents a pound. Profit was low at these prices.

### Try Supplemental Feeding

Animals fed on irrigated pasture alone usually finish no better than fleshy feeders or commercial slaughter cattle, and bring less per pound than slaughter grades of good to choice. It is, however, usually possible and profitable to supplement irrigated pasture with grain and concentrates for a few months before animals are marketed, raising them to a slaughter grade of good.

In examples 2, 3, 4, and 5, the market animals are fed concentrates over the last three months to make the slaughter grade of good. The animals are worth two cents more a pound than if sold without the grain feeding. Feeding to good is more profitable or less unprofit-

able than not giving the grain supplement--about 600 pounds of grain per head (see the comparisons in table 4). Supplemental feeding increases weight per head as well as value per pound.

## COMPARE BUDGETS AND PRICES

### Plan Different Budgets of Expense

Make budgets of expected costs and income and compare them. It is the safest way to arrive at the most profitable use of your irrigated pasture. It is difficult but well worth the effort. The five sample budgets given in detail will guide you in preparing your own alternate budgets. You may not need to make your budgets in such detail. In your comparisons, the available pasture (in AUM) should be the same for all budgets.

A shortcut is merely to estimate the income and differences in expense--supplemental hay and grain for the different enterprises. Start with the stock count by month and follow through the cycle in order to see what you need to buy and sell.

### Estimate Prices

In estimating costs and income, you need to use different prices for the kinds of animals and the time of the year. See table 3 for prices of several kinds of beef animals in spring and fall at Stockton during the last few

TABLE 3: RECENT BEEF CATTLE PRICES AT STOCKTON

	1950	1951	1952	1953	1954	Our budgets
	Cents per pound					
Choice slaughter steers						
Spring: Feb. to April inclusive	25	34	35	25	24	23
Fall: Sept. to Nov. inclusive	29	35	31	23		23
Good slaughter steers						
Spring: Feb. to April	24	33	33	22	21	21
Fall: Sept. to Nov.	28	33	28	20		20
Good slaughter heifers						
Spring: Feb. to April	22	32	32	21	20	19
Fall: Sept. to Nov.	27	32	27	19		18
Utility cows						
Spring: Feb. to April	19	26	23	15	13	13
Fall: Sept. to Nov.	22	25	16	11		12
Choice, Good feeder steers 500-800 lbs.						
Spring: Feb. to April	25	34	34	21	21	19
Fall: Sept. to Nov.	28	34	25	17		18
Choice, Good stocker steer calves						
Spring: Feb. to April	26	39	37	23	21	20
Fall: Sept. to Nov.	32	38	26	17		19



years. The prices under "Our Budgets" are the prices used in the examples (tables 5 to 9). They are not future price predictions but simply the prices we would use now (September 1954).

Buying feeder cattle for irrigated pasture and selling them several months later is a highly speculative undertaking. In the long run, your financial success is in proportion to your market wisdom--what you know of seasonal and long-term trends in prices of the different classes and grades of livestock.

### SAMPLE BUDGETS

To show you how and why some types of beef production enterprises are more efficient and have greater profit than others, we have prepared nine sample budgets. They are summarized in table 4. Five of them are given in detail in tables 5 to 9. These sample budgets will also help you make your own plans and budgets.

Each budget begins with a plan showing the number of head and animal units by months. The aim is always to get the best over-all adjustment of animals to pasturage as possible. The need to adjust the animal cycle to pasturage governs the dates of purchase and sale.

It is the first item to consider when making your plans. Rates of gain are estimated for each month.

Weights for each class of cattle are estimated for the first of each month. The animal units per head, based on this estimate, are used in figuring the total animal units of stock for that month. This figure is compared to the animal units of pasturage available. The difference is shown in the last column.

The next step is to estimate costs and income for the plan, or to make a budget. For simplicity and brevity, interest on investment has been omitted from table 2 in the charge for the pasture. Interest is also omitted from the beef enterprise budget. Only the total cash and depreciation cost is shown. This is the way you are most apt to figure your costs and profit.

The earning figure shown is income over cash and depreciation costs, or, as it is sometimes called, the capital and management income.

All labor is entered as a cash cost, although an operator doing all of the work of the pasture and cattle could add the value of his labor to the budget to get his net farm income.

You would need to add interest on indebtedness before figuring personal returns from the business.

PLAN	ANNUAL COSTS	ANNUAL INCOME	ANNUAL EARNING	ANNUAL DIFFERENCE
1. Buy 100 head of 1-year-old steers at \$10.00 each. Feed and care for 1 year. Sell at \$15.00 each.	\$1,000.00	\$1,500.00	\$500.00	
2. Buy 100 head of 2-year-old steers at \$12.00 each. Feed and care for 1 year. Sell at \$18.00 each.	\$1,200.00	\$1,800.00	\$600.00	
3. Buy 100 head of 3-year-old steers at \$15.00 each. Feed and care for 1 year. Sell at \$22.00 each.	\$1,500.00	\$2,200.00	\$700.00	
4. Buy 100 head of 4-year-old steers at \$18.00 each. Feed and care for 1 year. Sell at \$25.00 each.	\$1,800.00	\$2,500.00	\$700.00	
5. Buy 100 head of 5-year-old steers at \$20.00 each. Feed and care for 1 year. Sell at \$28.00 each.	\$2,000.00	\$2,800.00	\$800.00	
6. Buy 100 head of 6-year-old steers at \$22.00 each. Feed and care for 1 year. Sell at \$30.00 each.	\$2,200.00	\$3,000.00	\$800.00	
7. Buy 100 head of 7-year-old steers at \$25.00 each. Feed and care for 1 year. Sell at \$35.00 each.	\$2,500.00	\$3,500.00	\$1,000.00	
8. Buy 100 head of 8-year-old steers at \$28.00 each. Feed and care for 1 year. Sell at \$40.00 each.	\$2,800.00	\$4,000.00	\$1,200.00	
9. Buy 100 head of 9-year-old steers at \$30.00 each. Feed and care for 1 year. Sell at \$45.00 each.	\$3,000.00	\$4,500.00	\$1,500.00	



TABLE 4: COMPARISON OF SAMPLE BEEF ENTERPRISE BUDGETS FOR A 100-ACRE IRRIGATED PASTURE

	1. Sum- mer calves 6 mo.	Fall calves		3. Spring yrlg. to "good"	4. Fall yrlg. feeders to "good"	Cow herds			6. Buy & sell cows & calves
		2. To yrlg. "good"	2a. To yrlg. feeders			5. To yrlg. "good"	5a. To yrlg. feeders	5b. To weaner calves	
Number of head "in" or cows	300	200	200	200	143	62	62	80	140
Cost per cwt. of feeders "in"	\$20.00	\$19.00	\$19.00	\$19.00	\$18.00	---	---	---	\$11.00
Price per cwt. of stock sold	\$18.00	\$20.00	\$18.00	\$20.00	\$20.00	\$17.77	\$16.33	\$16.27	\$13.12
Cash and depreciation cost per pound prod.	\$10.15	\$14.35	\$12.06	\$16.87	\$19.17	\$22.87	\$21.77	\$24.00	\$15.27
Average gain per head	192 lbs.	480 lbs.	410 lbs.	358 lbs.	480 lbs.	---	---	---	c. 200 lbs.
Pounds TDN per pound gain	6.1 lbs.	7.0 lbs.	7.0 lbs.	8.4 lbs.	9.6 lbs.	11.6 lbs	11.7 lbs.	12.9 lbs.	9.4 lbs.
Pounds produced per acre of pasture	507 lbs.	684 lbs.	681 lbs.	564 lbs.	496 lbs.	414 lbs.	409 lbs.	371 lbs.	511 lbs.
Total livestock sales	\$33,437	\$34,496	\$28,577	\$37,751	\$31,640	\$ 9,317	\$ 8,167	\$ 7,387	\$24,218
Cost of stock purchased	\$26,000	\$15,200	\$15,200	\$22,800	\$16,731	\$ 300	\$ 300	\$ 300	\$15,360
Net stock income	\$7,437	\$19,296	\$13,377	\$14,951	\$14,909	\$ 9,017	\$ 7,867	\$ 7,087	\$8,858
Cash and depreciation costs: beef and pasture	\$5,660	\$13,271	\$9,501	\$11,601	\$12,511	\$11,831	\$10,731	\$10,731	\$7,801
Income over cash costs and depreciation, or capital and management income	\$1,777	\$6,025	\$3,876	\$3,350	\$2,398	-\$2,814	-\$2,864	-\$3,644	\$1,057

The nine sample budget summaries (1 to 6) will help you compare profit opportunities. Number 1 is for only half the year. The other 8 are based on the same price and cost conditions, the same intensity of use of pasture, and the same skill in management. Differences in production and earnings are due entirely to the kind of enterprise or stage of beef production. Numbers 1 to 5 are shown in detail in the following pages.

As you can see, calves show the most efficient gains--fewer pounds of TDN to produce a pound of gain and higher total gains per acre. Yearlings are next in efficiency, with a lower profit than calves. Cow herds show big losses because of the over-all low production and low value of beef produced. Number 6 shows the spring purchase of thin cows, some with calves, and the sale of fatter cows at utility grade and weaner calves in the fall.

NOTE: All samples are estimated on 100 acres.



TABLE 5: STEER CALVES, SUMMER TO FALL, FEEDERS SOLD

Buy weaner calves or bring them from spring range as weaned in June or July. The calves get irrigated pasturage and a little hay until sold or moved out as year-old feeders in October and November. The "in" value is 20¢ a pound; the "out" value is 18¢ a pound. It is a minus margin of 2¢. Gain is 192 pounds in an average of 143 days at 1 1/3 pounds per day.

This is not a full season's use of pasture. The 780 AUM used is charged at a higher cash and depreciation cost than in table 2. Remaining pasture would be used in some way for other animals and for hay.

Head and Animal Units by Month

Month	No. hd.	Wt. 1st mo.	AU per hd.	AUM		
				Stock	Pas-ture	Differ-ence
Jan.					10	10
Feb.					10	10
March					60	60
April					120	120
May					190	190
June	100	400	.50	50	180	130
July	300	450	.50	150	160	10
Aug.	298	493	.55	164	140	-24
Sept.	298	533	.57	170	130	-40
Oct.	297	572	.60	178	110	-68
Nov.	100	612	.65	65	60	-5
Dec.		652			30	30
Total	1393		.56	777	1200	423

SAMPLE EXPENSES, INCOME, AND PROFIT FOR SUMMER TO FALL STEER CALVES

	AUM feed	Total quantity	Price or cost	Total value	Per head sold	Per cwt. prod.
Irrigated pasture, June-November	780	780 AUM	\$ 5.50	\$4,290	\$14.44	\$7.69
Hay to supplement pasture	75	30 tons	20.00	600	2.02	1.08
Salt and minerals				20	.07	.03
Total feed and feed cost	855 AUM	342,000 lbs.TDN*		\$4,910	\$16.53	\$8.80
Labor, cattle only		400 hrs.	\$ 1.00 per hour	\$ 400	\$ 1.35	\$ .72
Misc. : Vet., etc.				300	1.01	.54
Depreciation cattle facilities				50	.17	.09
Total cash and depreciation cost				\$5,660	\$19.06	\$10.15
Stock sales and purchases	No. hd.	Av. wt.	Total wt.	Price per lb.	Total value	Per hd. sold
Feeder steer, 1 yr.: Oct.-Nov.	297	625 lbs.	185,764 lbs.	18¢	\$33,437	\$112.58
Less - calves: May-July	300	433	130,000	20¢	26,000	87.54
Net stock produced and income	- 3	192	55,764	- 2¢	\$ 7,437	\$ 25.04
Income above cash and depreciation costs (pasture and cattle)				\$1,777	\$ 5.98	\$ 3.19

\* The 342,000 pounds of TDN from pasturage and hay equals 6.1 pounds of TDN per pound of gain. With 91 per cent of TDN from pasture, gain from pasturage is 507 pounds for the 6 months of use.

This enterprise fits a large cattle ranch where there are cattle to use the pasture the rest of the year. A large cattle ranch would have facilities to feed the calves and to market them at the end of the pasture season.

You may do all the work of pasture and cattle yourself. If you do, add about \$800 for pasture labor and \$400 for cattle labor. Your net farm income is now \$3,977 for only part of the season's potential use.



# EXAMPLE 2

**TABLE 6: FALL PURCHASED CALVES TO BE FED FOR MARKET THE FOLLOWING FALL**

Buy stocker steer calves about November 1. Carry them through the winter on hay and a little pasture. In spring and early summer put them on pasture only. To raise the animals to a slaughter grade of "good," begin feeding them a concentrate mixture in July. Increase the concentrates progressively until you sell the calves in late September. There are no cattle on the pasture in October. Pasture has a chance to grow before you begin the next group in November and December.

Head and Animal Units by Month						
Month	No. hd.	Wt. 1st mo.	AU per hd.	AUM		
				Stock	Pas-ture	Differ-ence
Jan.	198	465	.50	99	10	- 89
Feb.	197	502	.52	102	10	- 92
Mar.	197	540	.55	108	60	- 48
April	197	580	.60	118	120	2
May	197	630	.65	128	190	62
June	196	680	.70	137	180	43
July	196	730	.75	147	160	13
August	196	775	.80	157	140	- 17
Sept.	196	825	.85	167	130	- 37
Oct.		880			110	110
Nov.	200	400	.45	90	60	- 30
Dec.	199	430	.47	94	30	- 64
Total	2169			1347	1200	-147

You can make about 30 tons of hay from surplus pasturage in May and June. The 1,200 AUM of pasturage appears in the sample as 1,125 AUM in pasture and 75 AUM in the harvested hay. Charge the harvested hay at \$10 a ton.

**SAMPLE EXPENSES, INCOME, AND PROFIT FOR FALL PURCHASED CALVES**

	AUM feed	Total quan- tity	Price or cost	Total value	Per head sold	Per cwt. prod.	
Irrigated pasture for the year	1125	100 acres	\$55.61	\$5561	\$28.37	\$6.01	
Harvesting hay from pasture	75	30 tons	10.00	300	1.53	.33	
Additional hay purchased	187	75 tons	20.00	1500	7.65	1.62	
Concentrates and grain for finishing	225	60 tons	60.00	3600	18.37	3.89	
Salt and minerals				60	.31	.06	
Total feed and feed costs	1612	644,800 lbs. TDN		\$11021	\$56.23	\$11.91	
Labor: Cattle only		1200 hrs.	\$ 1.00	\$ 1200	\$ 6.12	\$ 1.30	
Misc.: Taxes, car, vet., etc.			per hr.	850	4.34	.92	
Depreciation on beef facilities				200	1.02	.22	
Total cash and depreciation costs				\$13271	\$67.71	\$14.35	
	No. hd.	Av. wt.	Total wt.	Price	Total value	Per hd. sold	Per cwt.
Steers sold at "good"	196	880 lbs.	172,480 lbs.	\$20.00	\$34496	\$176.00	\$37.30
Less feeder calves bought	200	400 lbs.	80,000 lbs.	\$19.00	\$15200	\$ 77.55	\$16.44
Net stock produced and income	-4	480	92,480 lbs.	\$ 1.00	\$19,296	\$ 98.45	\$20.86
Income over cash costs and depreciation					\$ 6,025	\$ 30.74	\$ 6.51

Allow 1,612 AUM of feed for the 1,347 AUM of stock. The surplus covers waste and extra grain required for fattening to grade of good. The 644,800 pounds TDN equals 7 pounds TDN per pound of gain. With 74 per cent of TDN from pasturage, gain per acre is 684 pounds.

Fall purchased calves, fed for market the following year, is probably your most profitable way to use irrigated pasture in beef production, especially if your entire farm is irrigated pasture. Nevertheless, 11 months between purchase and sale does present a large risk of price drop. On the other hand, you have a chance for extra profit if the price goes up.

These animals are grain fed. If they weren't, they would sell at lower weights for less money. The net income (table 4 , example 2a) would be less.



TABLE 7: YEARLINGS FROM SPRING TO FALL, SOLD AS GOOD

Buy yearling feeders in the spring when pasture is ready. Sell them after some grain feeding, as slaughter steers in the fall. The price used in this budget is a cent higher for feeders in the spring than in the fall. But it may be higher than that. Spring to fall yearlings fit the pasturage well. However, you still have a May and June surplus to make into hay. Feed 610 pounds of concentrates per head for the last 3 months, to bring the animals to a slaughter grade of good. The 1,450 AUM of feed for 1,127 AUM of stock allows for waste and fattening.

Month	No. hd.	Wt. 1st mo.	AU per hd.	AUM		
				Stock	Pas-ture	Differ-ence
Jan.					10	10
Feb.					10	10
Mar.	70	600	.60	42	60	18
April	200	614	.65	130	120	-10
May	199	660	.70	139	190	51
June	198	715	.75	149	180	31
July	198	765	.80	158	160	2
Aug.	197	810	.85	167	140	-27
Sept.	197	860	.90	177	130	-47
Oct.	110	915	.95	105	110	5
Nov.	60	965	1.00	60	60	
Dec.		1015			30	30
Total	1429			1127	1200	73

SAMPLE EXPENSES, INCOME, AND PROFIT FOR SPRING TO FALL YEARLINGS

	AUM feed	Total quan- tity	Price or cost	Total value	Per head sold	Per cwt. prod.	
Irrigated pasture for the year	1125	100 acres	\$55.61	\$5,561	\$28.33	\$ 8.09	
Harvesting hay from pasture	75	30 tons	10.00	300	1.52	.44	
Additional hay purchased	25	10 tons	20.00	200	1.02	.29	
Concentrates and grain	225	60 tons	60.00	3,600	18.27	5.23	
Salt and minerals				40	.20	.06	
Total feed and feed costs	1450	580,000 lbs.TDN		\$9,701	\$49.24	\$14.11	
Labor: Cattle only		1200 hrs.	\$ 1.00	\$1,200	\$ 6.09	\$ 1.75	
Misc.: Taxes, insurance, car, etc.			per hour	500	2.54	.72	
Depreciation beef facilities				200	1.02	.29	
Total cash costs and depreciation				\$11,601	\$58.89	\$16.87	
	No. hd.	Av. wt.	Total wt.	Price	Total value	Per hd. sold	Per cwt.
Good slaughter steers, Sept.	87	915 lbs.	79,605 lbs.				
Good slaughter steers, Oct.	50	965	48,250				
Good slaughter steers, Nov.	60	1015	60,900				
Total sales	197	958 lbs.	188,755 lbs.	20¢	\$37,751	\$191.63	\$54.90
Less feeder yearlings bought	200	600 lbs.	120,000 lbs.	19¢	\$22,800	\$115.74	\$33.16
Net stock produced and income	- 3	358 lbs.	68,755 lbs.	1¢	\$14,951	\$ 75.89	\$21.74
Income over cash and depreciation costs					\$ 3,350	\$ 17.00	\$ 4.87

The 580,000 pounds TDN equals 8.4 pounds TDN per pound of gain. With 82 per cent of the TDN from pasture, the gain per acre is 564 pounds.

Your animals in this budget are about as old as the animals in sample 2. But the yearlings are bought in the spring instead of the preceding fall. With greater weight, efficiency of gain is not as high. Furthermore, spring feeders may cost a cent more than they do in this budget. If they do, profit will be even lower (by about \$1,200) than it is here.

Depending on prices, spring to fall yearlings may be well fitted to your irrigated pasture when it is the only feed on the farm.



EXAMPLE 4

TABLE 8: FALL YEARLING FEEDERS, FED TO GOOD--2-YEAR-OLDS

There are more yearling feeders in the fall than at any other time. You can get them for the lowest prices. But you have to carry them through the winter, mostly on hay. You can make 40 tons of hay from surplus pasturage in May and June. However, you need another 80 tons to keep up fair rates of gain (the animals should finish at good). The 1,567 animal unit months of total feed in pasture, hay, and concentrates gives you a surplus to cover waste and provide for fattening.

Head and Animal Units by Month						
Month	No. hd.	Wt. 1st mo.	AU per hd.	AUM		
				Stock	Pas- ture	Differ- ence
Jan.	142	715	.77	109	10	-99
Feb.	142	750	.80	114	10	-104
Mar.	141	780	.82	116	60	-56
April	141	820	.85	120	120	
May	141	860	.90	127	190	63
June	140	910	.95	133	180	47
July	140	965	1.00	140	160	20
Aug.	140	1020	1.00	140	140	
Sept.	140	1075	1.00	140	130	-10
Oct.		1130			110	110
Nov.	143	650	.70	100	60	-40
Dec.	142	680	.75	107	30	-77
Total	1552			1346	1200	-146

SAMPLE EXPENSES, INCOME, AND PROFIT FOR FALL YEARLING FEEDERS

	AUM feed	Total quan- tity	Price or cost	Total value	Per head sold	Per cwt. prod.	
Irrigated pasture for year	1100	100 acres	\$55.61	\$5,561	\$39.72	\$8.52	
Hay harvested from above pasture	100	40 tons	10.00	400	2.86	.61	
Additional hay purchased	200	80 tons	20.00	1,600	11.43	2.45	
Concentrates and grain	167	45 tons	60.00	2,700	19.28	4.14	
Salt and minerals				50	.36	.08	
Total feed and feed cost	1567	626,800 lbs.TDN		\$10,311	\$73.65	\$15.80	
Labor: Beef cattle only		1200 hrs.	\$ 1.00	\$1,200	\$ 8.57	\$ 1.84	
Misc. : Taxes, car, vet., etc.			per hour	800	5.71	1.22	
Depreciation of beef facilities				200	1.43	.31	
Total cash and depreciation costs				\$12,511	\$89.36	\$19.17	
	No. hd.	Av. wt.	Total wt.	Price	Total value	Per hd. sold	Per cwt.
Slaughter good steers, Sept.	140	1130 lbs.	158,200 lbs.	20¢	\$31,640	\$226.00	\$48.49
Less feeder yearlings, Nov.	143	650 lbs.	92,950 lbs.	18¢	\$16,731	\$119.51	\$25.64
Net stock produced and income	- 3	480 lbs.	65,250 lbs.	2¢	\$14,909	\$106.49	\$22.85
Income over cash costs and depreciation					\$ 2,398	\$ 17.13	\$ 3.68

The 626,800 pounds TDN equals 9.6 pounds TDN per pound of gain. The animals get 76 per cent of their feed from pasture which means they gain about 496 pounds per acre. The animals are heavier and a year older than in examples 2 and 3. Since the animals need more feed per pound of gain, you can get only 140 animals on the 100 acres, instead of 200.

Usually you make less money with these animals. However, prices in the market sometimes give you a chance for a bigger profit. In 1951, feeder calves (sample 2) cost 23¢ a pound or 5¢ a pound more than the yearlings in this sample. But earnings are still slightly higher in sample 2, even at the same selling price of 20¢.



**TABLE 9: BREEDING HERD, SELLING GOOD SLAUGHTER YEARLINGS AND 90 PER CENT OF CALF CROP, INCLUDING 2-YEAR-OLD HEIFERS**

Number of Head and Animal Units by Month

	Bulls	Cows	Calves			Yearling Steers			Yearling Heifers			AUM		
			No. hd.	Wt. 1st mo.	AU per hd.	No. hd.	Wt. 1st mo.	AU per hd.	No. hd.	Wt. 1st mo.	AU per hd.	Stock	Pas-ture	Dif-ference
Jan.	2	61	40	100		26	620	.65	25	580	.60	94	10	-84
Feb.	2	61	50	130		26	650	.67	24	610	.62	95	10	-85
Mar.	2	60	55	170	.15	26	680	.70	24	640	.65	104	60	-44
April	2	60	55	220	.20	26	720	.75	24	675	.70	109	120	11
May	2	60	51	280	.25	26	765	.80	24	715	.72	113	190	*77
June	2	60	51	340	.30	26	815	.85	24	755	.75	117	180	63
July	2	60	51	400	.40	26	860	.90	24	795	.80	125	160	35
Aug.	2	56	51	450	.45	26	905	.95	24	835	.82	125	140	15
Sept.	2	53	51	490	.50	26	960	1.00	24	885	.85	127	130	3
Oct.	2	50	51	530	.55	26	1010	1.00	12	925	.90	117	110	- 7
Nov.	2	62	51	560	.57	sell	1070		to			93	60	-33
Dec.	2	62	51	590	.60				cows			95	30	-65
Total	24	705	608			260			229			1314	1200	-114

\* Surplus pasturage in May to July is made into 60 tons of hay.

**SAMPLE EXPENSES, INCOME, AND PROFIT FOR THE BREEDING HERD**

	AUM feed	Total quan- tity	Price or cost	Total value	Per AU year	Per cwt. prod.	
Irrigated pasture for year	1050	100 acres	\$55.61	\$5,561	\$50.79	\$10.75	
Hay from pasture	150	60 tons	10.00	600	5.48	1.16	
Additional hay purchased	225	90 tons	20.00	1,800	16.44	3.48	
Concentrates	75	20 tons	60.00	1,200	10.96	2.32	
Salt and minerals				60	.54	.12	
Total feed and feed cost	1500	600,000 lbs.TDN		\$9,221	\$84.21	\$17.83	
Labor: Cattle only		1500	\$ 1.00	\$1,500	\$13.70	\$ 2.90	
Misc.: Taxes, car, vet., etc.			per hour	900	8.22	1.74	
Depreciation on cattle facilities				210	1.92	.40	
Total cash and depreciation costs				\$11,831	\$108.05	\$22.87	
	No. hd.	Av. wt.	Total wt.	Price	Total value	Per hd. AU	Per cwt.
Veal calves: April	4	250 lbs.	1,000 lbs.	21¢	\$ 210	\$ 1.92	\$ .41
Yearling steers, good : Oct.	26	1070	27,820	20¢	5,564	50.81	10.76
Yearling heifers, good: Sept.	12	925	11,100	18¢	1,998	18.25	3.86
Utility cows : July-Sept.	10	1100	11,000	12¢	1,320	12.06	2.55
Bull to be replaced	1	1500	1,500	15¢	225	2.05	.43
Total sales	53		52,420 lbs.	18¢	\$9,317	\$85.09	\$18.01
Less replacement bull	1		700 lbs.		\$ 300	\$ 2.74	\$ .58
Net stock produced and income	52		51,720 lbs.		\$9,017	\$82.35	\$17.43
Income over cash costs and depreciation					-\$ 2,814	-\$25.70	-\$5.44

Production is high for a cow herd, but total production is low. The value of cow and heifer beef is low, too. Altogether, the result is a large loss for you, instead of a profit. Pasture is stocked at 1,314 animal unit months, or 109.5 animal unit years. This is about the same as the other samples. The 600,000 pounds TDN equals 11.6 pounds TDN per pound gain for all the animals. The animals get 80 per cent of their food from the pasture, or 414 pounds gain per acre.



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