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University of California
Agricultural Extension Service
Farm Management Short Course
Sacramento - 1963

BEEF CATTLE PRODUCTION

by Jim Elings, Extension Animal Husbandman, UCD

INTRODUCTION - In putting together this discussion on beef cattle, I'm deeply indebted to the livestock farm advisors in the other counties, namely: Carl Schoner, Yolo; Art Swenerton; Solano; Barry Leeson, El Dorado; and Jack Herr, Placer. My own experience in beef cattle production is closely related to Sacramento County, where I served almost 8 years as livestock farm advisor -- up to November of 1962.

In these five counties we have quite a cross section of the beef industry in California, cutting right across the Sacramento Valley, from the top of the Sierras to the Coast Range and the San Francisco Bay. This represents many different kinds of beef operations, under many different kinds of environmental and economic conditions. We'll have time for only a fast look at some of these.

BEEF PRODUCTION IN CALIFORNIA - Cattle numbers in California have been steadily increasing over the years with currently well over 4 million head being reported, of this number, over 3 million were beef cows and calves, the balance being dairy cattle. California is a deficit state for beef cattle and meat. We import large supplies. The following tables will give you an idea:

Stockers and Feeders Shipped into Calif., 1952 - 62
(1000 head)

<u>1952</u>	<u>53</u>	<u>54</u>	<u>55</u>	<u>56</u>	<u>57</u>	<u>58</u>	<u>59</u>	<u>60</u>	<u>61</u>	<u>62</u>
860	821	1,094	923	1,176	878	1,043	1,095	1,455	1,454	1,830

The above table shows that cattle shipments into the state increased 376,000 head in 1962 and has more than doubled during the past decade. Texas is the principal source of these cattle, with 776,000 last year. Other important states are the neighboring states of Arizona, Nevada and Oregon -- these 3 states totaled 568,000 shipped in last year. Following these 3 was Mississippi with 74,000. We also get cattle from many other states, Canada and Mexico.

Cattle Shipped into Calif. for Immediate Slaughter, 1952 - 62
(1000 Head)

<u>1952</u>	<u>53</u>	<u>54</u>	<u>55</u>	<u>56</u>	<u>57</u>	<u>58</u>	<u>59</u>	<u>60</u>	<u>61</u>	<u>62</u>
500	739	797	667	789	658	532	523	450	375	458

Notice the trend. Slaughter cattle in shipments peaked in 1956 with 789,000 head, declined to 375,000 head in 1961. Our State's fantastic growth in cattle feeding certainly influenced this trend. Here are the figures:

Marketings from Feedlots, Calif., 1953 - 1962

(1000 head)

<u>53</u>	<u>54</u>	<u>55</u>	<u>56</u>	<u>57</u>	<u>58</u>	<u>59</u>	<u>60</u>	<u>61</u>	<u>62</u>
1,034	1,116	1,340	1,291	1,342	1,358	1,441	1,595	1,699	1,814

Feedlot production in the state has jumped 80 percent in the past decade. It already has passed some earlier projections for 1975.

BEEF PRODUCTION IN THE FIVE COUNTY AREA

Numbers and Trends.

Beef Cattle Numbers

<u>County</u>	<u>1950</u>	<u>1955</u>	<u>1960</u>	<u>1962</u>
Placer	14,000	21,000	21,000	21,000
Yolo	6,100	13,500	29,000	29,000
Solano	47,300	58,000	59,000	59,000
El Dorado	16,500	14,300	12,700	12,000
Sacramento	45,000	60,000	72,500	100,500
Total	121,900	167,000	194,200	225,500

The above figures show that the overall beef cattle numbers have been increasing and may have reached a plateau, with the exception of El Dorado County. The two factors responsible for the decline in numbers in El Dorado County is (1) the influx of people into the county who work in the Sacramento metropolitan area, subdivisions and higher taxes, and the breaking up of larger land units into smaller acreages unable to support economic cattle outfits and (2) the reduction in numbers of cattle allowed to run on national forests. Factors accounting for the stability and increase in cattle numbers in the other four counties is the feedlot industry and changes in class of livestock utilizing feed resources -- eg cattle replacing sheep. El Dorado is the only county without feedlots.

Kinds of Beef Cattle Operations

1. Cow-calf -- This type of operation runs a herd of brood cows, and the production is weaner calves and/or yearlings, plus cull cows and bulls. The cow herd is maintained year round, and because of this, all or a good part of the feed resource must be cheap for these operations to be profitable. Most of these operations are based on range land, a source of cheap winter feed. Quite often it is necessary and desirable to supplement range feed in the late fall or early winter with hay, protein supplement or grain. Summer feed comes from irrigated pasture and/or mountain range. A number of outfits in Placer, El Dorado and Sacramento counties depend on mountain range for all or part of their summer feed.

2. Stocker - feeder operations. These operations buy and sell. They utilize foothill range and irrigated pasture for the most part, although stubble, crop residues and hay may also be used. The kind of cattle they buy to market this feed will depend on the availability and price of the different kinds of cattle, and the outlook. These cattle can be light weaner steers, thin yearlings, thin cows, pregnant cows and pairs (cows with calves). These cattle are purchased locally but most of them come from N. Calif. and out of state. The purpose of these operations is to put on cheap gain on roughage.

3. Feedlots -- More will be said about cattle feeding in a later section. It has already been noted that this industry has been responsible for maintaining beef cattle income in the 5 county area, (the exception being El Dorado). In 1962, cattle fed in the area totaled around 147,000 head. The growth of this industry is unparalleled in the case of Sacramento county, which goes something like this: 1950 -- 1000 head; 1955 -- 5,000 head; 1960 -- 60,000 head; 1961 and 1962 -- over 70,000 head.

4. Purebreds -- This is a minor part of the industry dollarwise, but important in it's influence because it supplies seed stock through bulls used in cow-calf herds. It's important that these cattlemen be progressive, good managers and breeders, who keep current on the latest developments in beef breeding research. Some of them are members of such organizations as the California Beef Cattle Improvement Association, an organization of producers of registered cattle, who follow a UC directed improvement program that makes it easier for them to improve their cattle, not only for conformation and beef type but gaining ability. There are about 40 purebred herds in the 5 county area. Ten of them are members of the CBCIA.

FEED RESOURCES

Range -- This is sometimes called native range, foothill range, or native pasture. These terms apply to unimproved rolling grassland, most of which borders the valley and goes up into the foothills. However, there is considerable acreage on the valley floor that at one time may have been devoted to dryland cereal grain production, and may again so be used. Carrying capacity varies, depending on topography, soil type, amount of brush and trees, and rainfall. On a year-round basis, carrying capacity runs from 15 to 50 acres per cow. However, most of this feed is used during late fall, winter and spring months. Here in Sacramento county the season runs from November to May - June. In Yolo on the west side from January through May. Rental value of this land will run from \$1 to \$1.50 per acre per year for rough brush range to \$3 to \$5 on open rolling hill range. There's about 1,270,000 acres of range in the 5 county area -- an important feed resource, suitable only for livestock grazing.

Irrigated pasture -- Acreage in the area shows an upward trend as follows:

Irrigated Pasture Acreage

<u>County</u>	<u>1950</u>	<u>1955</u>	<u>1960</u>	<u>1962</u>
Placer	9,100	14,000	19,000	21,000
Yolo	11,152	9,144	8,000	8,000
Solano	15,000	17,500	20,000	20,000
El Dorado	2,000	2,400	2,500	2,100
Sacramento	20,000	35,000	45,000	46,300
	<u>62,252</u>	<u>78,044</u>	<u>94,500</u>	<u>97,400</u>

Placer, El Dorado and Solano expect increases in irrigated pasture acreage. Here in Sacramento county water costs, taxes and metropolitan growth will tend to stabilize the figure or even cause it to decline. Yolo is declining because row crops are replacing pasture when land is suitable.

Most pastures are seeded to a mixture of grasses and legumes most suitable to soil type and climate for maximum production. Carrying capacity varies from 8 aum's to 20 aum's depending on soil, condition and age of the pasture and management practices. For example, a good irrigated pasture on hardpan land in Sacramento, properly fertilized and irrigated can be stocked from March to November or later with an average carrying capacity of 1.2 animal units per month, or a total of 10.8 for the year. Pounds of beef per acre per year ranges from 400 to 700 plus.

Crop Residues -- This is stubble of all kinds, beet tops, corn and milo after harvest, etc. This feed may be rented by the cattleman from a farmer producing row or cereal crops. Stubble makes up an important part of the summer feed for some cow herds in Solano and Yolo counties. It provides some fall feed for stocker-feeder operators, although the practice is to use sheep to harvest much of this feed.

Feed Grains -- These are barley, milo, corn and to a small extent, oats. The ready availability of large amounts of feed grains, competitively priced is the basis for our feedlot industry. Some of the field crop farm advisors will give you the picture on feed grain production in the area. Last year Calif. produced 2.4 million tons of feed grains and imported 1.94 million tons. Most feed grain consumed locally is produced in the valley with the exception of some milo, probably imported from Texas.

Hay Crops -- Type of hay crops supporting beef industry is usually irrigated pasture or clover hay, grain hay, oats and vetch, some red clover and some alfalfa. The latter usually goes to dairies. It's usually necessary to feed some hay to cattle on range during November, December and January. Feedlots use all kinds of hay including alfalfa, but the percentage of hay in the ration has dropped to 10 to 20%. Hay is both purchased and grown.

The Delta -- The Sacramento delta is known for production of crops of all kinds, but not for livestock. But some day there may be, considering the potential feed production per acre and depending upon the success of a few innovators already operating in the area. Consider the possibilities when you can raise 35 to 40 tons of corn silage per acre -- there's no way to raise more pounds of TDN per acre. Consider a beef cow operation on peat land in San Joaquin county, where they run 2 cows per acre the year round.

FACTORS IN BEEF PRODUCTION

Good Management -- This factor is sometimes difficult to measure, but I suspect that each of you has your own technique or procedure for evaluating management ability. One of the most obvious these days is the ability to survive the present cost-price squeeze. Other factors include an adequate record keeping or bookkeeping system, a grazing program that utilizes feed resources rather than abusing them, an indication of some planning or thinking ahead, and a realization by the operator that he's in business rather than a way of life.

Grazing Management -- Operating a beef cattle enterprise involves more than turning cattle out to graze. More efficient utilization of range forage through intensive grazing management, i.e., cross fencing to facilitate field rotation and more uniform usage of forage by reducing field size, improving the distribution of sources of stock water by spring development, piping, earth filled reservoirs, etc. can in many cases have a much greater influence at considerable less cost. This approach coupled with sound reseeding practices can provide an improved species distribution and reduce the population of undesirable weedy annuals.

Good range management would also include the operator's ability to recognize native feed quality and quantity in order that adequate supplementation could be carried out. Some range grazing lands are better suited to stocker operations than to cows and calves and table 9, page 18 and 19 of the enclosed publication, "Planning Profitable Beef Production" will point this out.

The same factors hold for irrigated pasture.

Cattle Health -- Because of its impact on a successful operation, cattle health should be treated in considerable detail. One of the cost items appearing on the data sheets is for veterinarian and medical expenses. Much of the preventative and maintenance treatment is performed by the operator or his hired help, but frequently professional veterinary assistance is required and should be recognized and called upon when needed. In California there are no particularly limiting bovine diseases, yet within areas and from time to time certain problems crop up which require immediate attention in order to avoid losses.

Among the breeding diseases, of which there are many, the most important one in our area is Leptospirosis. Fortunately, there are effective bacterins now on the market which provide at least a temporary immunity (one year) so this can not be controlled effectively. Unfortunately, a virus disease causing abortion (Epizootic Bovine Virus abortion), also called foothill abortion, foothill disease, is still with us and as yet there is no treatment or immunization, but effective management can minimize if not entirely eliminate it.

Routine vaccination of calves for Blackleg and malignant edema is practiced widely. Heifer calves are vaccinated for brucellosis. Anaplasmosis can cause losses. Among the other diseases of younger animals which cause the most trouble locally are scours (enteritis), foul foot (foot rot) and pinkeye, all of which can be treated and cured if caught in time.

Operations that move their cattle around, or buy and sell as a routine practice have the most disease problems. Outfits that operate under one fence usually experience a minimum of loss from disease.

Pasture areas of any size should have veterinarians on a retainer basis.

Nutrition -- Problems in nutrition are frequently confused with disease and in many cases can actually cause disease outbreaks. In general within a cow herd the level of nutrition depends upon the season of the year and the kinds of forage on which the cattle are feeding. Supplementation of protein, vitamins and minerals (see cost data sheets) are necessary at various periods during the year. Native green forage during the spring months provides an adequate level of nutrition for a lactating beef cow, but as the season progresses and the feed dries it fails to meet the animals requirements for protein, vitamin A and minerals (primarily phosphorous). This can be corrected by supplementing with cottonseed meal or cake or with alfalfa hay or other sources of protein, vitamin A, calcium and phosphorous. The kind of supplement used will be determined by the relative prices of the ingredients and their availability.

Herd Management -- This is being treated separately from disease and nutrition in order to enumerate some of the more important points.

Certainly in a breeding operation, success is going to depend upon the number of calves weaned and their weights. Most of the herds in this area shoot for at least a 90% calf crop. They don't always get it though. This figure is calculated from the number of cows bred and the number of calves weaned. In general the calves are weaned at 8 to 9 months of age with the heifers weighing 400-500 pounds and the steers from 475 to 575 pounds.

A high percentage calf crop is the result of more than just luck. Some of the more important reasons being that an adequate number of bulls are used in this area (4 to 6 bulls per 100 cows is the rule depending on field size and terrain). The ages of breeding bulls is an important factor and a good operator avoids running all old or all young bulls with the same herd. We normally consider 2 to 4 years of productivity for a bull. Cows are culled on production and old cows generally leave a herd at the age of 8 to 10. A good operator will replace breeding females at a level of 15 to 20% per year. Using gain tested bulls and bulls from production tested herds will insure herd improvement.

Many cattlemen are now taking the guess work out of their calving percentage by pregnancy testing. This is a simple nearly foolproof palpation diagnosis performed by a qualified veterinarian and can eliminate open cows which would otherwise be expensive free loaders. It is generally done about 120 days after the bulls have been taken out and can be performed in conjunction with the spraying or weaning operation. Good operators will periodically gather their cattle in order to get a closer look at them and will treat or spray or do whatever might be necessary to effect a more efficient operation.

Marketing -- This phase of the livestock operation probably poses the biggest problem to most operators. It has been said that cattlemen don't sell their product, but simply transfer title to another owner. This situation has improved considerably in recent years, however, as a result of better communications, improved Federal-State Market News facilities, and a realization on the part of stockmen of the necessity of keeping themselves better informed.

Most ranches now have a set of livestock scales which may be tested and sealed annually by the county which provide the rancher with a ready tool to determine the progress he's making. This eliminates a lot of the guesswork and gives him a double check on sale weights.

Stockton is the last terminal market stockyards facility in California but most of our beef calves and yearlings and feedlot sales are made in the country. Some of these sales are made by the operator, but more often are taken care of by a commission man or order buyers. These people are most highly skilled, reputable men employed by the several commission firms on the Stockton Market or by the Valley Livestock Marketing Association or the packer and are bonded to protect the producer. In many cases they can do a better job than the producer because of their familiarity with the market and their many contacts. There is a trend now developing to more auction sales (a total of 47 in Calif.) and many producers are consigning to this type of market.

You might ask what justifies the continued existence of a local terminal market facility with the increase in country and auction marketing. The answer is that it provides an excellent outlet for cull livestock and for small groups of animals which otherwise would be difficult to sell in the country.

Economics, Including Cost Studies -- It's usual for many cattle operations to make a very small return on total investment, two percent or less. Years ago, we used to talk about a 100 cow operation as an economic unit. In recent years we revised that upward to 200 cows. Maybe we should talk about 300 cows or more these days.

I've included some cost studies. One is a study on a cow-calf operation by H. N. Moore and P. F. Parsons on a San Joaquin County cow and calf operation. The others were put together by Parsons and Farm Advisor Jack Herr of Placer County.

COST DATA SHEET FOR A
SAN JOAQUIN COUNTY RANGE COW AND CALF RANCH
H. M. Moore, San Joaquin County Farm Advisor
and
Philip S. Parsons, Extension Economist

With dwindling profits in the cattle business today brought about by the cost-price squeeze, the need for careful and detailed record analysis has increased. The following sample cost data are presented to provide a guide to follow in planning and analyzing a typical local cow and calf operation.

The following definitions and explanations may help in the interpretation and use of these data:

INVESTMENT REQUIRED -- The values shown for livestock are based upon 1962 average values for an above average grade of cattle. The land valuation is considerably higher than that originally paid by long standing ownerships, but in most cases will be less than the present going prices. Equipment and building values represent the present costs of adequate, but not elaborate construction.

INCOME -- Prices based on averages prevailing for the late summer and fall of 1962.

ANNUAL CASH OPERATING COSTS -- This is the actual cash outlay to operate the ranch for a year. It is assumed that from time to time extra help will be needed, but except for \$500.00 it will be provided by trading with neighbors.

DEPRECIATION -- It is assumed that amounts shown will actually be spent for replacement and repairs each year. Even if allowed to accumulate, it will have to be spent eventually.

INTEREST -- This is not shown. Note that Farm Income pays the operator for his labor, his management and the interest on his investment. If interest on the investment had been shown as a separate item on this data sheet under non-cash cost, a negative return would have resulted.

COST DATA SHEET FOR A SAN JOAQUIN COUNTY RANGE COW AND CALF RANCH

<u>INVESTMENT REQUIRED</u>	<u>TOTAL</u>	<u>PER COW</u>
1. Stock		
a. 200 cows @ \$200 per head	\$ 40,000.00	\$ 200.00
b. 30 replacement heifers @ \$150 per hd.	4,500.00	22.50
c. 10 bulls @ \$500 per head	5,000.00	25.00
d. 3 horses @ \$200 per head	<u>600.00</u>	<u>3.00</u>
Total Stock	\$ 50,100.00	\$ 250.50
2. Land		
2,000 acres @ \$110.00	\$210,000.00	\$1,050.00
3. Buildings & Corrals (exclude owner's house)		
Corrals \$2,500; Storage, horse barn, shop & shed \$8,000	10,500.00	52.50
4. Fence - 15 miles @ \$1,000 a mile	15,000.00	75.00
5. Dams, well, etc.	10,000.00	50.00
6. Equipment:		
Pickup, 2-ton stock truck, horse trailer, tractor, disk, harrow, fert. spreader, welder, saddles, miscellaneous	<u>10,000.00</u>	<u>50.00</u>
Total Investment	\$305,600.00	\$1,528.00

INCOME

1. 90% calf crop 2% mortality equals 176 calves (30 heifers saved for replacements)			
88 - 450 lb. steers sold @ 27¢	39,600	10,692.00	53.46
58 - 410 lb. heifers sold @ 25¢	23,780	5,945.00	29.73
2. 20 cull cows, 1,100 lbs. @ 18¢	22,000	3,960.00	19.80
3. 10 cull cows, 750 lbs. @ 13¢	7,500	975.00	4.88
4. 3 bulls, 1500 lbs. @ 20¢	<u>4,500</u>	<u>900.00</u>	<u>4.50</u>
Total	97,380	\$ 22,472.00	112.37

COST DATA SHEET FOR A SAN JOAQUIN COUNTY RANGE COW AND CALF RANCH

<u>ANNUAL CASH OPERATING COSTS</u>	<u>TOTAL</u>	<u>PER COW</u>
1. Feed, 25 tons range supplement @ 65.00	\$ 1,625.00	\$ 8.13
Hay - ½ ton/cow/year, 100 tons @ 24.00	2,400.00	12.00
<u>TOTAL FEED COSTS</u>	<u>\$ 4,025.00</u>	<u>\$ 20.13</u>
2. 3 bulls for replacements	1,500.00	7.50
3. Hired labor	500.00	2.50
4. Salt	60.00	.30
5. Fertilizer, seed and fuel	2,300.00	11.50
6. Veterinary expenses	500.00	2.50
7. Misc. (office, interest on borrowed operating capital, etc.)	1,200.00	6.00
8. Taxes (assume 5½ tax rate, 28% assess- ment)		
1. 200 cows	450.00	2.25
2. 176 calves	220.00	1.10
3. 30 replacement heifers	52.50	.26
4. 10 bulls	40.00	.20
5. 3 horses	7.20	.04
6. land	2,940.00	14.70
7. buildings, equipment, wells and fences	627.00	3.14
<u>TOTAL CASH COSTS</u>	<u>\$14,421.70</u>	<u>\$ 72.12</u>
<u>DEPRECIATION</u>		
Fences, \$15,000.00 @ 5%	\$ 750.00	\$ 3.75
Equipment, \$10,000.00 @ 10%	1,000.00	5.00
Buildings, \$10,500.00 @ 5%	525.00	2.63
Dams and wells, \$10,000.00 @ 5%	500.00	2.50
<u>TOTAL DEPRECIATION</u>	<u>\$ 2,775.00</u>	<u>\$ 13.88</u>
<u>TOTAL COST OF PRODUCTION</u>	<u>\$17,196.70</u>	<u>\$ 85.98</u>
<u>FARM INCOME</u>	<u>\$ 5,275.30</u>	<u>\$ 26.38</u>

CATTLE FEEDING -- This particular segment of the cattle industry has experienced a greater growth and more changes during recent years than any other phase of the business. This has been the result primarily of the increasing population, our national prosperity and changes in consumer diet habits. In the last ten years California has increased in the number of cattle fed or finished for market by about 400%. The January 1 figure of 1,005,000 on feed represents an increase of 26% over a year ago.

Approximately 550 feedlots are located in California with over a third of these having a capacity of 1000 head or more. It is estimated that this one third will fatten 90% of the total cattle fed. A little over 40% of the total feedlot capacity of the state is located from Kern County south with about half of this in the Imperial Valley; 20% is located in the San Joaquin Valley (mainly Fresno County) and the remaining capacity is divided equally between the Sacramento Valley and the central coast. It's obvious that this distribution is the result of favorable year-round weather for feeding, a good local supply of feed-stuffs or both.

Sharply increased demand for more and better quality beef has practically eliminated the so-called grass fat steer. Consumer preference for white rather than yellow fat and smaller retail cuts has resulted in an accelerated feeding program pointed toward finishing cattle to lighter weights at younger ages. In spite of this trend toward younger animals, there is a wide range in the kind, the quality and the age of California feedlot cattle. Thousands of head of Holstein steers are fed every year in California along with many off-type dairy and brahma crossbreds. Cows and bulls are also seen in many feedlots. There is a market for all of these classes of beef and because of the seasonal nature of supply, there are times when money can be made fattening any given class. The main factors taken into consideration by a feeder to determine his program are seasonal price structures generally established by supply, market trends, purchase price and feed costs.

The energy contained in a ration determines the rate of gain. A healthy animal will consume feed at the rate of about 3% of its body weight. An 800 pound animal then would eat about 24 pounds of air-dry feed per day. As a ration becomes more concentrated and its energy increases, this rate of consumption becomes less. The body capacity of the animal limits the amount of dry matter intake so that the energy content is what determines the rate of gain in the feedlot.

Feed Value -- This has been traditionally expressed in terms of TDN or total digestible nutrients which simply is the amount of nutrient in any feedstuff that is digested by the animal. TDN, expressed as a percentage has been determined on practically all livestock feedstuffs and is the basis generally for pricing feeds. TDN for many years was the basis on which rations were computed, but more and more the term, net energy is being used. TDN values are determined simply by measuring the feed consumed and the manure excreted and taking the difference. Net energy on the other hand takes into consideration energy losses in urine, gas and heat increment (often referred to as the "work of digestion"). After these energy losses have been deducted from the total digestible energy, the remaining energy which is available to the animal for maintenance and growth is referred to as net energy. Where TDN is expressed in pounds or per cent, net energy is expressed in therms. One therm equals 1000 calories.

Feed Conversion -- This is frequently referred to as the efficiency of the animal and needless to say is the most important single economic factor to the feeder. Young animals are more efficient than older ones and the longer an animal has been fed and the fatter he is, the less efficient he becomes. This is because it takes more energy to put on a pound of fat than a pound of lean (about $2\frac{1}{4}$ times as much).

Feed conversions will vary from a little less than seven to nearly twelve pounds of feed necessary to put on a pound of gain. This factor will depend upon the animal's age, health, environment and the nature of the ration. An average expression of conversion commonly used is ten to one.

Methods of Feeding and Feedlot Equipment -- Size and variety of feedlots cover a wide range from the small scoop shovel farm operation to the large automated commercial lot.

The two types of mills most commonly used are the batch type and the constant flow type. Both systems are efficient and have advantages and disadvantages. Some very modern facilities are utilizing auger-type automatic feeding systems, but most lots feed from trucks into bunkers. Corrals are usually constructed to provide 100 to 150 square feet of space per animal and about $1\frac{1}{2}$ feed of feeder space. Some feeding facilities are located on rolling land providing natural drainage, but more commonly are located on the flat valley floor. These lots usually build mounds, in the corrals, of earth, rocks or dry manure to provide loafing areas.

A fairly recent development has been the glass lined silo used to store high moisture grain and low moisture silage. This is a mid-western import which would appear to have some practicability under California conditions.

The silage to which the manufacturers refer as haylage is an extremely uniform, very palatable succulent roughage, and when incorporated with a grain ration, can produce cheap gains. If more experience indicates its practicability, its ultimate use will probably be in growing out young cattle on inexpensive home-grown feeds in order to cheapen them up for the final expensive finishing period. It is virtually impossible to get young animals to yield and grade high enough to meet the demands of the market on a bulky, high roughage ration alone. The cost summary on page 17 was compiled from data obtained in Fresno County last year and should be applicable to a similar operation in this area.

Methods of Feeding -- Cattle fed in California originate from out of state, Old Mexico or locally with the latter term applying to all California or native cattle. The way they are fed depends upon their class, age, quality and degree of condition and of course, the degree of finish that the feeder wants to achieve. As stated earlier, the trend is toward younger cattle and lighter finish weights so many calves or weaners now go directly to the feedlot where formerly they were grown out on grass. These young cattle are normally yarded and fed a high roughage-low concentrate ration until they are ready to go on to full feed. Once the final period of feeding is reached, they will generally be placed on a 40% concentrate-60% roughage ration and the concentrate increased and roughage decreased until a full feed ration of 80 or 90% concentrate is reached. Feeder cattle of 600-700 pounds will usually take at least four months to reach the choice grade and to yield 60%. Most feeders will get cattle on full feed in three to four weeks.

Many cattle are custom fed on a monthly billing basis. The usual pricing system is for the feeder to bill the owner for the actual cost of the feed-coverage. This coverage is currently running eight dollars per ton and includes yardage, milling charges, his other operating costs and his profit, vaccines, implant charges and unusual medical expenses are usually extra. Costs per pound of gain will vary from feedlot to feedlot and between lots of cattle depending upon their class, age, size, health, environment and feeding season and will range from 20¢ to 30¢ a pound.

Outlook for Feeding Cattle -- It would appear that due to high fixed costs and a fairly narrow margin of profit, the larger feedlots are in the most favorable position. This is a business requiring skillful management and the large feedlots can provide this with trained nutritionists, cattle buyers, experienced marketing people and generally a more efficient use of labor. Further advantages accrue with the lower per head investment in facilities and increased efficiency in the use of milling equipment along with the cost advantages in the volume purchase of feedstuffs.

Roy Parker, Kern County Farm Advisor who has had considerable experience working with the large cattle feeding operations in his area, says, "The well managed feedlot has been making money over the past few years. The feeding business will probably become more competitive during the next few years particularly from new feeding areas in other states. There has been an increase in feedlots in west Texas and the inter-mountain area (particularly Colorado). The competition would be particularly keen for feeder cattle, but in spite of the keener competition it looks as if the well operated feedlot will continue to make money".

PROBLEMS AND THE FUTURE

Land Costs and Taxes -- Beef cattle production, primarily cow-calf and stocker operations depend on cheap feed. This is grass, produced on cheap land with a low tax bill. In many areas of our state, and the same is true in areas of other states, land is becoming too expensive, taxes too high to operate economically. On the other hand, the lands in these areas are suitable only for cattle grazing. Cattle are the only means of harvesting and providing a market for the grass produced.

People -- Freeways, good roads, the ease of transportation, the desire for many people to live in the country and the standard of living that makes it possible -- all of these things multiply the problems facing the cattleman. There's more and more pressure for recreational use of open spaces, whether these lands are publicly or privately owned. Consider the problems -- the location of a subdivision out in rural Sacramento county, within a mile of an established feedlot and a mile from several good sized hog operations.

The Future -- This will depend on a number of factors. First, expansion or even maintenance of the beef industry will depend on the protection given the industry through zoning and the break they get on land values and taxes. There's several million acres of brushland in the state that's potential range land. Government programs at all levels will influence the economic status and expansion or diminution of the industry. The feeding industry is directly affected by U.S. government feed grain programs, and how long and how well it can compete with other feeding areas for feeder cattle.

SILAGE

THIS IS ANOTHER WAY TO MAKE EXPENSIVE CALVES CHEAPER - The most common way is with grass. But we'd like to show how it can be done with corn silage. This is the time-honored way of getting cheap gains on cattle in the midwest. We can grow as much or more corn silage per acre here -- why won't it work here?

Let's set up a hypothetical situation; First though, take a look at the average analysis of corn silage: Dry Matter is 27.6%; digestible protein is 1.2%; TDN (Total Digestible Nutrients) is 18.3%.

Now let's say we want to put some gain on 300-400 pound calves at 1.25 to 1.5 pounds per day. Here's how you could do it with corn silage and a bit of alfalfa hay -- taking them up to about 700 pounds, with 500 pound average weight during this feeding period.

	<u>Dry Matter</u>	<u>Dig. Protein</u>	<u>TDN</u>
Average Daily Requirement 500 lb. calf	11.5 lbs.	.86 lb.	7.8 lbs.

Feed - Corn Silage @ 30 lbs/day	8.28	.42	6.4
Alfalfa @ 4 lbs/day	4.00	.44	2.0
	<u> </u>	<u> </u>	<u> </u>
TOTALS DAY	12.28 lbs.	.86 lb.	8.4 lbs.

The above ration is more than adequate -- is calculated from tables in Morrison's Feeds and Feeding. The small calves would start out on about 20 pounds of silage.

Keeping the alfalfa at 4 pounds per day will balance the ration for the whole feeding period.

Silage costs - We have some local and San Joaquin Valley figures to fall back on, and depending on yield per acre, total investment, cropping practices, and feeding practices, corn silage will cost \$6 to \$10 per ton, in the feed bunk. Two tons of good corn silage has a feed value equivalent to a ton of good hay for many beef feeding programs.

Feed cost per pound of gain - Here's what it would be figuring a 1.25 lb. average daily gain.

Silage @ \$10/ton and Hay @ \$20/ton	-	15.2¢
Silage @ \$8/ton and Hay @ \$20/ton	-	12.8¢
Silage @ \$6/ton and Hay @ \$20/ton	-	10.4¢

Some more pencil pushing will enable you to come up with the purchase price and feed cost of a 700 lb. steer, purchased at 400 pounds and fed to gain 300 pounds on corn silage and alfalfa hay, as follows:

	Silage @-----\$10/ton	8/ton	\$6/ton
400 lb. calf @ 28¢-----	.112	.112	.112
300 lb. gain -----	<u>45.62</u>	<u>38.40</u>	<u>31.20</u>
TOTAL	\$157.62	150.40	\$143.20
Purchase and feed cost per lb. of 700 lb. steer -----	22.8¢	21.5¢	20.5¢

(Taken from Sacramento County LIVESTOCK NOTES, March 1962)

HAYLAGE COST SUMMARY
compiled from Fresno County Data

INVESTMENT FOR HAYLAGE

Item	Cost	Years Life	Depreciation	Interest	Cash Overhead
Swather (1)	\$ 5,200	8	\$ 650	\$ 156	104
Chopper (2)	4,200	5	840	126	84
Truck (1)	350	5	70	10	7
Blower (1)	700	5	140	21	14
Harvestore (4)	48,100	7	6,871	1,443	962
Unloader (4)	9,165	7	1,309	275	183
Augers - Elevator Switch Boxes & Wiring	6,300	10	630	189	126
Tractors (2)	8,600	6	1,433	258	172
Wagons (3)	9,000	5	1,800	270	180
Total	91,615		13,743	2,748	1,832
TOTAL OVERHEAD	18,323				

OPERATING COST OF HARVESTING AND FEEDING HAYLAGE

Harvesting	Cost Per Hour				Tons Dry Matter Per Hour	Cost Per Ton
	Labor	Fuel	Repairs	Total		
Swather	1.25	.50	.60	2.35	3.0	.78
Chopper	1.25	.50	.80	2.55	2.0	1.28
Haul	1.00	.30	.30	1.60	2.0	.80
Blower	1.10	.15	.05	1.30	2.0	.65
						<u>3.51</u>
Feeding						
Unloaders	1.10	5.5¢	60.0¢	1.755		
Conveyors	----	2.5	2.5	.05		
Tractor	----	30.0	5.0	.35	3.0	.74
Wagon	----	----	7.5	.075		
				<u>2.23</u>		<u>4.25</u>

TOTAL COST OF HAYLAGE

Tons Dry Matter	Cost Per Ton		
	Overhead	Operating	Total
3200	5.72	4.25	9.97
3600	5.09	4.25	9.34
4000	4.58	4.25	8.83
4400	4.16	4.25	8.41
4800	3.82	4.25	8.07